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Paper 7
Entered: October 25, 2022

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MARKFORGED INC.,
Petitioner,
v.

CONTINUOUS COMPOSITES, INC.,
Patent Owner.

IPR2022-00679
Patent 10,744,708 B2

Before GRACE KARAFFA OBERMANN, JO-ANNE M. KOKOSKI, and SHELDON M. McGEE, *Administrative Patent Judges*.

McGEE, *Administrative Patent Judge*.

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

I. INTRODUCTION

Petitioner filed a Petition (Paper 2, "Pet.") for institution of an *inter partes* review of claims 1–21 of U.S. Patent No. 10,744,708 B2 (Ex. 1001, "the '708 patent").

Patent Owner filed a Preliminary Response (Paper 6, "Prelim. Resp."). The parties identify a district court action as a related matter: *Continuous Composites, Inc. v. Markforged, Inc.*, No. 1:21-cv-00998-MN (D. Del.). Pet. 1; Paper 5, 1. Patent Owner also identifies IPR2022-00548, IPR2022-00652, and IPR2022-00732,[1] as well as pending US Patent Applications 16/946,469, 17/481,147, 17/453,309, and 17/453,313 as related matters.

II. BACKGROUND

A. The '708 Patent (Ex. 1001)

The '708 patent relates to "[a] method and apparatus for the additive manufacture of three-dimensional objects" where "[t]wo or more materials are extruded simultaneously as a composite, with at least one material in liquid form and at least one material in a solid continuous strand completely encased within the liquid material." Ex. 1001, code (57). According to the '708 patent, this "method is called Continuous Composite Three-Dimensional Printing (CC3D)." *Id.* at 2:12–13.

The '708 patent indicates that the primary material is a curable liquid, such as a photosensitive resin, and the secondary material is a solid strand,

[1] The petitions in these three proceedings were denied on September 9, 2022. IPR2022-00548, Paper 9; IPR2022-00652, Paper 8; IPR2022-00752, Paper 7.

such as carbon fiber. *Id*. at 2:25–28. "These two materials are extruded together, with the secondary material fully encased within the primary material," thus creating a composite material. *Id*. at 2:28–30. "The use of CC3D with various composites [] allows for increased flexibility in design and function" because "[c]omposite material adds strength during the manufacturing, allowing paths to extend in three dimensions, rather than along horizontal planes" common in traditional additive manufacturing. *Id.* at 2:65–3:2.

The '708 patent teaches that "[p]rior to manufacturing a part, the manufacturer designates an origin," which is "any point on a surface suitable for anchoring the part during manufacturing. This point of contact is called an anchor." *Id.* at 8:37–40. Once the composite material is first extruded onto a surface, an anchor point is established, thus "allowing the extruder to pull on the secondary material during the extrusion." *Id.* at 10:4–9. Figure 9 of the Drawings, reproduced below, illustrates this pulling action from the extruder:

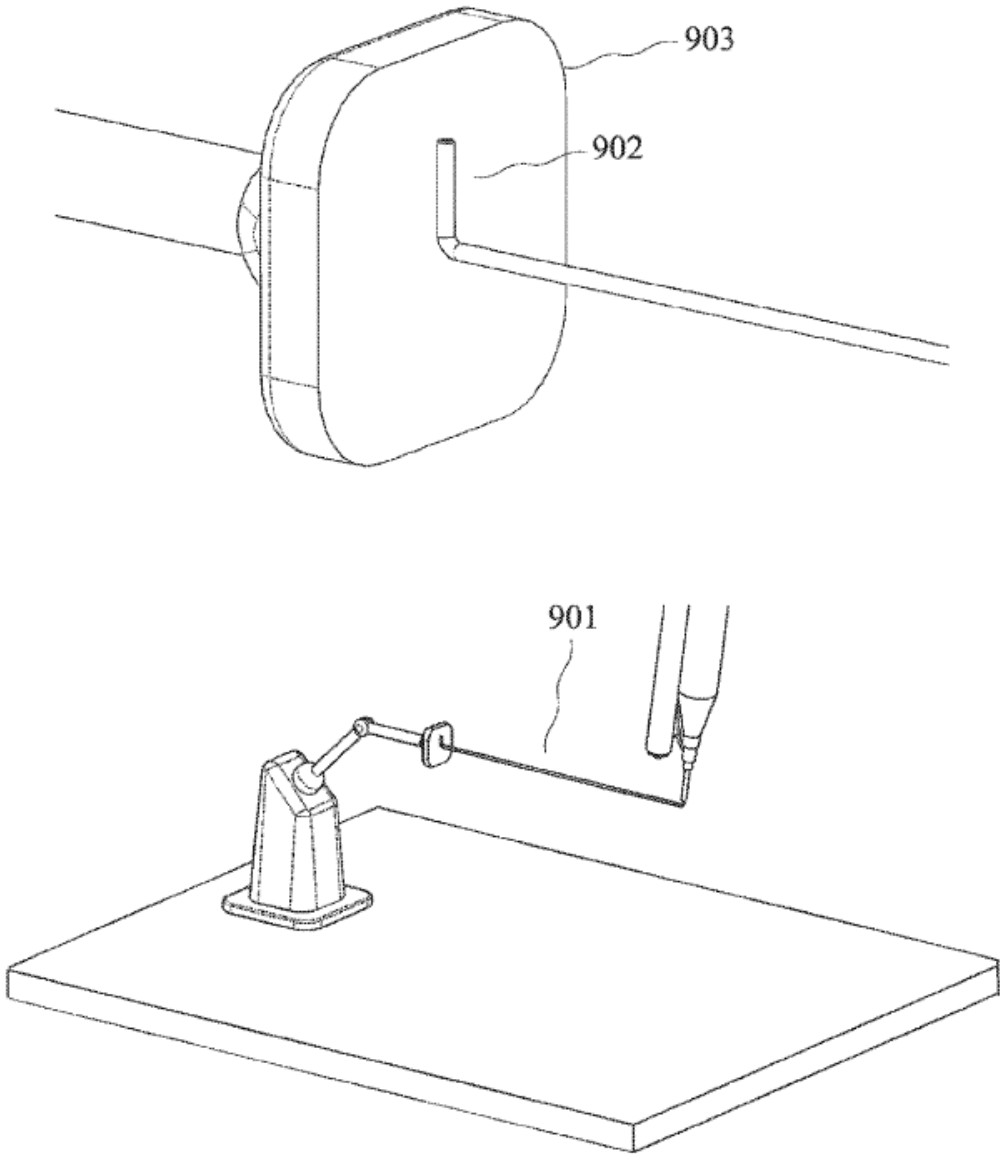

Fig. 9

Figure 9 shows a short length of composite path 902 extruded onto and adhered to vertical plane anchor 903, and depicts an extruder pulling tension path 901 in a horizontal direction away from anchor 903. Ex. 1001, 10:4–20. "The initial contact between the proposed part and the anchor must provide enough adhesion to support the tension force desired." *Id.* at 10:14–16.

B. Challenged Claims

We reproduce below independent claims 1, 13, 20, and 21, which illustrate the '708 patent's subject matter:

> 1. [pre] A method of additively manufacturing a three-dimensional object, the method comprising:
>
> [a] emitting from an extruder a path of composite material containing a continuous strand encased in a primary material, [b] the continuous strand being at least one of a wire and a fiber; and
>
> [c] moving the extruder during emitting such that the path is pulled out of the extruder during at least a portion of the manufacturing of the three-dimensional object.

> 13. [pre] A method of additively manufacturing a three-dimensional object, the method comprising:
>
> [a] emitting from an extruder a path of composite material containing a continuous strand and flakes of fiber encased in a primary material, [b] the continuous strand being at least one of a wire and a fiber;
>
> [c] moving the extruder during emitting; and [d] hardening the path of composite material.

> 20. [pre] A method of additively manufacturing a three-dimensional object, the method comprising:
>
> [a] emitting from an extruder a path of composite material containing a continuous strand encased in a primary material, [b] the continuous strand being at least one of a wire and a fiber;
>
> [c] hardening the path after emission; and
>
> [d] selectively cutting the continuous strand before the path of composite material is emitted such that at least a portion of the path emitting from the extruder contains only the primary material.

> 21. [pre] A method of additively manufacturing a three-dimensional object, the method comprising:

> [a] emitting from an extruder a path of composite material containing a continuous strand encased in a primary material, [b] the continuous strand being at least one of a wire and a fiber;
>
> [c] adjusting a trajectory of the path of composite material to a new location after emission from the extruder and [d] hardening the path after adjustment.

Ex. 1001, 10:59–67, 11:50–12:6. 12:30–49 (bracketed material added).

C. Grounds of Unpatentability Asserted in the Petition

Petitioner advances ten grounds of unpatentability asserting that the subject matter of claims 1–21 would have been obvious under 35 U.S.C. § 103(a)[2] as set forth in the following table.

Claims Challenged	Statutory Basis	Reference(s)
20, 21	§ 103(a)	Lipsker
1–4, 9–12, 20, 21	§ 103(a)	Lipsker, Ma
5–8	§ 103(a)	Lipsker, Crump
13–19	§ 103(a)	Lipsker, Nikzad
1, 2, 9, 10, 21	§ 103(a)	Ma
3, 4, 11, 12, 20	§ 103(a)	Ma, Lipsker
5, 6	§ 103(a)	Ma, Crump
7, 8	§ 103(a)	Ma, Crump, Lipsker
13, 14	§ 103(a)	Ma, Nikzad
15–19	§ 103(a)	Ma, Nikzad, Lipsker

[2] The Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112-29, 125 Stat. 284 (2011), revised 35 U.S.C. § 103 effective March 16, 2013. Because the '708 patent claims priority to an application filed before March 16, 2013 (Ex. 1001, codes (22), (60)), we refer to the pre-AIA version of Section 103.

Pet. 3–4. Petitioner relies on the Declaration of Dr. David Rosen (Ex. 1002) in support of its challenge of claims 1–21.

III. ANALYSIS

We have authority to institute an *inter partes* review only where "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). The findings and conclusions set forth in this Decision are provided for the exclusive purpose of explaining our determination that Petitioner has met that standard on this record.

A. Overview of the Prior Art

1. Lipsker (Ex. 1006)

Lipsker is directed "to rapid prototype deposition modeling techniques and apparatus." Ex. 1006, 1:4–6. In particular, Lipsker "seeks to provide improved rapid prototype deposition modeling techniques and apparatus wherein a building material is added layer by layer to build an accurate replica of a given object, without having to remove building material to arrive at the finished prototype." *Id*. at 1:52–56.

Lipsker's Figure 1 is reproduced below.

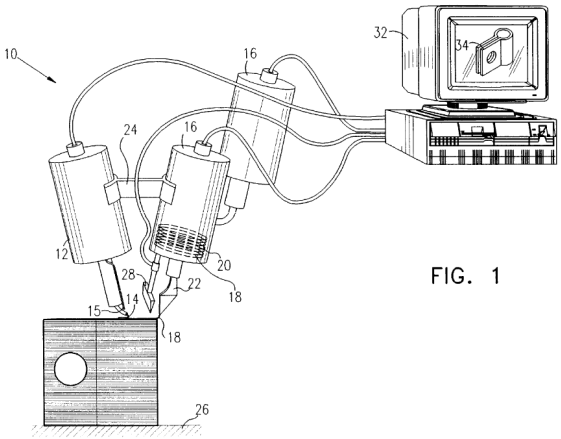

FIG. 1

Figure 1 is simplified pictorial illustration of a rapid prototype apparatus described in Lipsker. Ex. 1006, 2:65–67. Prototype apparatus 10 includes adhesive dispenser **12** for dispensing adhesive **14** and wire dispenser **16** for dispensing wire **18**. *Id*. at 3:27–28, 46–47. Wire **18** is stored within storage receptacle **20** and dispensed through nozzle **22** onto bed **26**. *Id*. at 3:47–49, 56. Bracket **24** fixedly attaches adhesive dispenser **12** to wire dispenser **16**. *Id*. at 3:54–55. Cutter **28** is provided for cutting wire **18** after being dispensed by wire dispenser **16**. *Id*. at 4:50–51. Apparatus **10** also includes actuator **30**, which moves adhesive dispenser **12** and wire dispenser **16** in at least one (preferably four or six) of six degrees of freedom. *Id*. at 4:60–63. Actuator **30** communicates with computer **32**, which contains a database containing the three-dimensional geometry of object **34**. *Id*. at 5:1–3. Actuator **30** may be used to move adhesive dispenser **12** and wire dispenser **16** according to the geometry of object **34**. *Id*. at 5:17–19.

Lipsker explains that actuator 30 "dispenses layers of wire **18** in accordance with the geometry of object **34**, and adhesive dispenser **12** applies adhesive **14** to wire **18** so as to bond a previously dispensed portion of wire **18** to a presently dispensed portion of wire **18**." Ex. 1006, 5:24–28. When adhesive **14** cures, the layers of wire **18** form a prototype of object **34**. *Id*. at 5:30–31. Lipsker teaches that "wires of different materials may be dispensed to form a multi-material prototype," and that "a portion of the prototype may be formed with a discardible wire . . . which serves as a support for other wires and which is purposely removed later to form the finished prototype." *Id*. at 5:32–36. Lipsker also teaches that "[a]dhesive dispenser **12** may be located so as to dispense adhesive **14** into nozzle **22** such that wire **18** is dispensed from wire dispenser **16** pre-coated with

adhesive **14**," and "application of the wires and adhesive may be synchronized in any desired manner." *Id*. at 5:56–60. Lipsker further describes embodiments wherein the prototype is "produced by only dispensing layers of adhesive **14** . . . in accordance with the geometry of object **34**, and thereafter curing the layers of adhesive **14**." *Id*. at 5:61–67.

2. Ma (Ex. 1007)

Ma is a dissertation relating to rapid prototyping and manufacturing technology. Ex. 1007, 7. Ma discloses an "Active Material Supplying" method where "[t]he material is affected by the pressure inside the nozzle that pushes the fluent material out of the orifice." *Id.* at 53. Ma also discloses a "Passive Material Supplying" method where "the towpreg is pulled out by the object instead of being pushed out by nozzle pressure." *Id.* at 54.

Ma distinguishes between these two methods, noting that with the "active" method, "the forming quality of a previous layer does not influence the forming of the current layer," while with the "passive" method, "the quality of a previous layer has a profound effect on the forming quality of the current layer." Ex. 1007, 53. Ma sets forth other problems with using the "passive" method. *See, e.g., id.* at 95–96, 98–107, 143, 145–147, 149. For example, Ma teaches that during deposition using the "passive" method, "it is possible to make a big error, especially when the nozzle makes a big-angle turn" (*id.* at 98), and that "[a] toolpath error could be generated if an anchoring point is not formed properly" when using the "passive" method (*id.* at 143). Ma also discloses that forming speed is an issue with the "passive" method, (*id.* at 146), but discloses "[o]ne of the advantages [of the

"active" method] is that the forming speed is not limited by the solidification condition of the towpreg during the forming process (*id.* at 168).

3. Crump (Ex. 1008)

Crump discloses an "[a]pparatus incorporating a movable dispensing head provided with a supply of material which solidifies at a predetermined temperature, and a base member, which are moved relative to each other along 'X,' 'Y,' and 'Z' axes in a predetermined pattern to create three-dimensional objects." Ex. 1008, code (57).

Crump discloses an embodiment in Figure 12 where "wire frame objects comprised of multiple, free-standing strands **180** defining wire frame segments **180*a*** and **180*b*** could be formed." *Id.* at 15:21–26. Figure 12 is reproduced below:

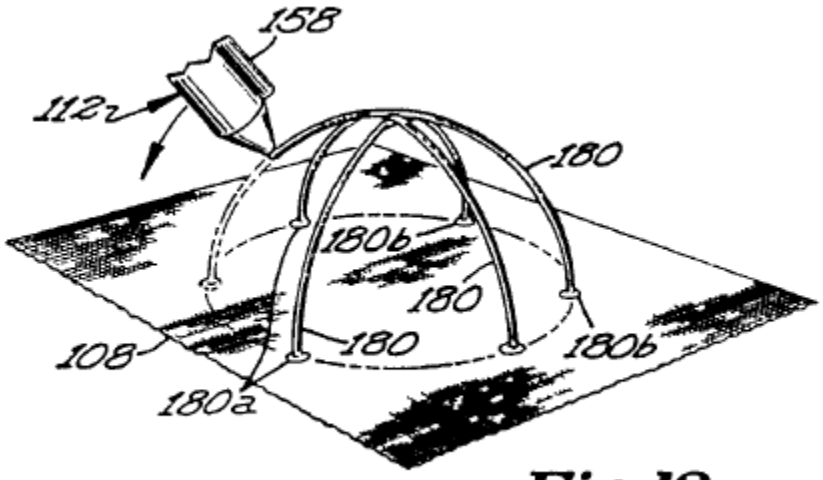

Fig 12

Crump's Figure 12 embodiment depicts forming strands **180** in an arcuate shape spanning from anchor points **180*a*** and **180*b***. Ex. 1008,

15:22–32. Crump teaches that "the strands are anchored at two points and also to each other where they intersect." *Id.* at 15:38–39.

4. Nikzad (Ex. 1009)

Nikzad discloses that its principle research objective "is to develop new metal/polymer composite materials for direct use in the current Fused Deposition Modelling rapid prototyping platform with [the] long term aim of developing direct rapid tooling on the FDM system." Ex. 1009, 2. "The new metal/polymer composite material developed in this research work involves use of iron particles and copper particles in a polymer matrix of ABS material, which offers much improved thermal, electrical[,] and mechanical properties enabling current the [FDM] technique to produce rapid functional parts and tooling." *Id.*

Nikzad teaches, *inter alia*, that "[u]nreinforced thermoplastics have lower stiffness and strength due to [the] existence of weak interchain forces (Van der Waals) between their molecules," and that the [o]rientation and reinforcement of polymeric chains can significantly increase tensile modulus and tensile strength by increasing interchain forces." *Id.* at 64. "Reinforcing fillers can very well be used in accordance with the macromolecular mixtures to increase the modulus and strength of polymeric matrices." *Id.*

B. Level of Ordinary Skill in the Art

Petitioner contends that a person having ordinary skill in the art ("POSITA") would have had "a master's degree in mechanical engineering, materials science, or a related degree, and at least 3–5 years of experience in composite materials or additive manufacturing," or a bachelor's degree in the same fields and at least 5–6 years of experience. Pet. 13–14 (citing Ex. 1002 ¶ 36). Patent Owner states that it "does not agree that Petitioner's

proposed level of skill in the art accurately reflects the level of ordinary skill in the art as of the priority date . . . [but] regardless of what level of skill is applied . . . the Petition does not show a reasonable likelihood to prevail." Prelim. Resp. 10. Patent Owner does not propose a different level of skill in the art at this stage of the proceeding. *See id*. ("Patent Owner reserves the right to propose a level of ordinary skill in the art in this proceeding should it be instituted, or in other proceedings.").

On this record, we determine that the level of ordinary skill is reflected in the prior art of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (specific findings on the ordinary skill level are not required "where the prior art itself reflects an appropriate level and a need for testimony is not shown" (quoting *Litton Indus. Prods., Inc. v. Solid State Sys. Corp*., 755 F.2d 158, 163 (Fed. Cir. 1985))). A more specific definition is not necessary for purposes of deciding whether to institute review. To the extent a more specific definition is required, however, we adopt Petitioner's proposed definition because, on this record, it is consistent with the disclosures of the asserted prior art references.

C. Claim Construction

In an *inter partes* review, we construe a claim in an unexpired patent "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) (2020). "[T]he ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc). "Importantly, the person of ordinary skill in the art is deemed to read

the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification." *Id.*

We agree with the parties that no claim term requires express construction for purposes of this Decision. Pet. 38–39; Prelim. Resp. 18–19; *see Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011) ("[C]laim terms need only be construed 'to the extent necessary to resolve the controversy.'").

D. Obviousness of claims 20 and 21 over Lipsker (Ground 1)

Petitioner asserts that claims 20 and 21 are unpatentable as obvious based on Lipsker's teachings. Pet. 23–34.

Patent Owner contends that Petitioner fails to provide sufficient reasons why the skilled artisan would have been motivated to combine the different embodiments within Lipsker. Prelim. Resp. 19–22. Specifically, Patent Owner asserts that "Petitioner relies simultaneously on Lipsker's non-precoating actuator embodiment of Figure 2 for elements 20[pre] and 21[pre] (claimed 'method') and on Lipsker's distinct precoating actuator embodiment of Figure 5 for elements 20[a] and 21[a] (claimed 'emitting')". *Id.* at 19–20. Accordingly, Patent Owner argues that "Petitioner relies on two entirely different embodiments of Lipsker as teaching different elements of independent claims 20 and 21." *Id.* at 21.

That argument does not undercut the sufficiency of Petitioner's information, for purposes of trial institution, because no showing is made on this record that the preambles of claims 20 and 21 are to be construed as a limitation. Generally, a preamble is not construed as a limitation. *Allen Eng'g Corp. v. Bartell Indus., Inc.*, 299 F.3d 1336, 1346 (Fed. Cir. 2002). In

particular, "when the claim body describes a structurally complete invention such that deletion of the preamble phrase does not affect the structure or steps of the claimed invention," the preamble is not considered a limitation. *Catalina Mktg. Int'l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 809 (Fed. Cir. 2002) (*citing IMS Tech., Inc. v. Haas Automation, Inc.*, 206, F.3d 1422, 1434 (Fed. Cir. 2000)).

Such appears to be the case with claims 20 and 21 because none of the limitations recited in the body of these claims has an antecedent basis in the respective preambles, and because the body of each claim appears to recite a complete method. Accordingly, at this stage of the proceeding, Patent Owner has not persuaded us that the portion of the preambles for which Petitioner relies on Figure 2—i.e., the language preceding "the method comprising"—is a limitation entitled to patentable weight. In other words, Patent Owner has not persuasively argued that deleting the portion of the preamble of claims 20 and 21 which states "[a] method of additively manufacturing a three-dimensional object" would affect the steps of these methods.

Patent Owner also asserts that even if we accept Petitioner's assertions regarding Lipsker's disclosure at face value, it "amount[s] to a 'mere showing that the prior art includes separate references covering each separate limitation'" and "does not ascertain the 'differences between the prior art and the claims at issue' or explain why the claims would have been obvious despite those differences." Prelim. Resp. 35–36 (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966)). That argument, too, is unpersuasive at this stage of the proceeding because Petitioner does not identify *any* differences between Lipsker's disclosure and claims 20 and 21.

See Pet. 25–34 (identifying where Lipsker "discloses" each of the claimed method steps 20[a], 20[b], 20[c], 20[d], 21[a], 21[b], 21[c], and 21[d]). Notably, Patent Owner has not challenged the accuracy of Petitioner's assertions regarding Lipsker's teachings of claims 20 and 21 on the current record. Prelim. Resp. 19–22, 35–36.

Thus, upon reviewing Petitioner's assertions and associated citations to evidence, we determine that Petitioner has demonstrated a reasonable likelihood that it would prevail with respect to its challenge of claims 20 and 21 over Lipsker.

E. Obviousness of claims 1–4, 9–12, 20, and 21 over Lipsker and Ma (Grounds 2 & 6)

Petitioner asserts that claims 1–4, 9–12, 20, and 21 are unpatentable as obvious over the combined teachings of Lipsker and Ma. Pet. 34–60, 83–86. Particularly relevant to Petitioner's challenges to claims 1–4 and 9–12, Petitioner relies on Ma's teachings to evince the claimed emission "such that the path is pulled out of the extruder during at least a portion of the manufacturing of the three-dimensional object." *See* Pet. 41–42 ("Ma explains how the anchor points—like the anchor points disclosed in Lipsker—secure the path and are used to pull the path from the extruder when the latter moves relative to the anchor points."); *see also id.* at 50 ("Element 9[c] is substantially similar to Element 1[c], which Lipsker in combination with Ma discloses.").

Petitioner asserts that the ordinarily skilled artisan would have been motivated to combine the disclosures of Lipsker and Ma because:

1) each reference is "directed to additive manufacturing methods for forming three-dimensional objects";

2) "Ma complements the work of Lipsker" and "provides additional details about passive material supply methods";
3) Ma's teachings are readily applicable to Lipsker and would "not require substantial changes or undue experimentation because Ma provides all the necessary experimentation via its dissertation work"; and
4) "Lipsker could benefit from Ma's teachings" because Ma discloses "photo-initiator additives in the adhesive so that cheaper or more readily available light sources (*e.g.*, visible light sources) can be used in place of or together with UV light sources," which "would make Lipsker's disclosed method more economical and flexible."

Pet. 34–36; *see also id.* at 83 (adopting these same rationales for Ground 6).

Patent Owner challenges Petitioner's proffered rationales to combine these references. Prelim. Resp. 19–39.

1. Analysis of claims 1–4 and 9–12

We are not persuaded that Petitioner has demonstrated a reasonable likelihood that it would prevail with respect to its challenge of these claims. Namely, Petitioner fails to provide sufficient reasoning supported by evidence that demonstrates that the ordinarily skilled artisan would have combined the teachings of Lipsker and Ma.

Even if we were to agree with Petitioner that Lipsker and Ma are in the same field of endeavor, i.e., "additive manufacturing methods for forming three-dimensional objects" (Pet. 34–35), that fact alone would be insufficient to demonstrate that the skilled artisan would have been motivated to combine these references at the time of the invention. Indeed, the Federal Circuit has held that merely asserting that two references are

drawn from the same field of art is "simply too conclusory" to show that the skilled artisan would have combined the references in the way of the claimed invention. *Securus Techs.*, 701 F. App'x 971, 976 (Fed. Cir. 2017); *see Microsoft*, 662 F. App'x 981, 990 (Fed. Cir. 2016) (determining that "the Board correctly concluded" that a petitioner "did not articulate a sufficient motivation to combine" where the only reason given was "that references were directed to the same art or same techniques."). The question of whether the prior art references are in the same field of endeavor is merely a threshold issue that must be satisfied *before* an obviousness determination can be made. *See K-Tec, Inc. v. Vita-Mix, Corp.*, 696 F.3d 1364, 1375 (Fed. Cir. 2012) (to qualify as prior art in an obviousness analysis, references must be analogous art—either in the same field of endeavor, or reasonably pertinent to the problem with which the inventor is involved). In other words, once it is determined that the prior art is analogous to the claimed invention, it is then necessary to show that it would have been obvious for the skilled artisan to select and combine the teachings of the prior art in the manner claimed.

Thus, we agree with Patent Owner that the Petition needs to set forth specific reasoning as to *why* the skilled artisan would have been motivated to combine these references even if they are in the same or similar fields. Prelim. Resp. 28–29. Petitioner has failed to do so on this record. And we find the absence of such reasoning particularly significant here in view of Ma's numerous teachings against the "passive" method of pulling the composite strand from the extruder. Each of these challenged claims require the path of composite material to be "pulled out of the extruder" (claims 1–

4) or "moving the extruder during emitting to generate tension[3] in the path of composite material" (claims 9–12). Patent Owner identifies no fewer than eight disclosures within Ma that seemingly disparage the passive "pulling" method and discuss benefits of the active "pushing" method. Prelim. Resp. 14–16 (citing Ex. 1007, 53, 95–96, 98–107, 143–147, 149, 167–168). In the absence of any explanation from Petitioner on this point, we are not persuaded on this preliminary record that the skilled artisan would have ignored those teachings and selected Ma's pulling method.

Petitioner's second reason to combine these references fares no better than the first because it, too, relies on Ma's "passive material supply mechanism in which a towpreg is pulled out from the extruder instead of being pushed out from the extruder." Pet. 35. Even if we were to overlook Petitioner's lack of explanation regarding Ma's teaching away from passive supply, Petitioner provides a single generic citation to one page of Ma—an exhibit that spans 248 pages—with no detailed explanation regarding how Ma's teachings would have enlightened the skilled artisan's understanding of Lipsker such that the skilled artisan would have arrived at the claimed subject matter. *Id.*

Petitioner's third reason to combine is similarly deficient because it fails to address the teachings of Lipsker and Ma with any degree of specificity and again does not elaborate on how or why the skilled artisan would have combined the teachings of these references to arrive at the

[3] Such tension results in pulling the composite material from the extruder. *See* Ex. 1001, 5:51–53 ("Certain embodiments create composite paths with tension, which will naturally pull the secondary material out through the nozzle.").

claimed subject matter. *Id.* Instead, Petitioner appears to be arguing that a skilled artisan could have combined unspecified teachings of Ma in unspecified ways to improve Lipsker's method. However, "obviousness concerns whether a skilled artisan not only *could have made* but *would have been motivated to make* the combinations or modifications of [the] prior art to arrive at the claimed invention." *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015).

Petitioner's fourth reason also lacks sufficient specificity and fails to provide any evidentiary support for the proposition that Ma's photo-initiator additives, if present in the adhesive, would allow for "cheaper and more readily available light sources" to be used "in place of or together with UV light sources." Pet. 35–36. Thus, Petitioner's statement essentially amounts to an unsupported conclusory assertion regarding a possible benefit. Assertions such as these fall short of providing the requisite rationale sufficient to support a conclusion of obviousness. *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (*cited with approval in KSR*, 550 US at 418). Additionally, "[a]ttorneys' argument is no substitute for evidence." *Johnston v. IVAC Corp.*, 885 F.2d 1574, 1581 (Fed. Cir. 1989).

Finally, we find on this preliminary record that Dr. Rosen's testimony supporting Petitioner's proffered motivations to combine is entitled to little or no weight. *See* Prelim. Resp. 27 (citing 37 C.F.R. § 42.65(a)). Here, the relied-upon portions of Dr. Rosen's Declaration simply parrot Petitioner's conclusory assertions. *Compare* Pet. 35–36, *with* Ex. 1002 ¶¶ 192–195.

For these reasons, we determine that Petitioner has not demonstrated a reasonable likelihood of prevailing with respect to its challenge of claims 1–4 and 9–12 over the combined teachings of Lipsker and Ma.

2. Analysis of claims 20 and 21

Claims 20 and 21 are slightly different than claims 1–4 and 9–12 because these claims do not appear to require pulling the path of composite material out of the extruder or generating tension during emission. Ex. 1001, 12:30–50.

Regardless, we find Petitioner's proffered motivations to combine Lipsker and Ma insufficient to demonstrate a reasonable likelihood of prevailing to either claim 20 or 21 for many of the same reasons provided with respect to claims 1–4 and 9–12. In other words, even considering the fact that claims 20 and 21 do not present the "teaching away" issues with respect to Ma's passive material supply, Petitioner's proffered reasons to combine Lipsker and Ma still fail to set forth specific reasoning as to why the skilled artisan would have been motivated to combine these references and are also insufficiently supported by evidence.

For these reasons, we determine that Petitioner has not demonstrated a reasonable likelihood of prevailing with respect to its challenge of claims 20 and 21 over the combined teachings of Lipsker and Ma. That said, and as set forth in Section III.D., *supra*, Petitioner has already demonstrated a reasonable likelihood of prevailing on claims 20 and 21 based on the disclosure of Lipsker alone.

E. Obviousness of claims 5–8 over Lipsker and Crump (Ground 3)

Petitioner asserts that claims 5–8 are unpatentable as obvious based on the combined disclosures of Lipsker and Crump. Pet. 60–68.

According to Petitioner, a person of ordinary skill in the art would have been motivated to combine the teachings of Lipsker and Crump because these references are both in the same field of endeavor, i.e.,

"methods for additively manufacturing three-dimensional objects." Pet. 60. Petitioner asserts that Crump also "introduces additional methods and material considerations for Lipsker" so that "Lipsker could benefit from Crump's disclosure" by identifying "adhesive materials that solidify instantly upon emission from the extruder and exposure to UV-light to form free-standing structures with or without" incorporating a wire. *Id.* at 60–61. Lastly, Petitioner states that applying Crump's teachings to Lipsker "does not require substantial changes or modifications." *Id.* at 61.

Patent Owner challenges Petitioner's proffered rationales to combine these references. Prelim. Resp. 22, 26–31, 34–36.

As we found with Petitioner's challenges based on Lipsker and Ma, Petitioner's identification of similarities between Lipsker and Crump is not sufficient, by itself, to support a conclusion of obviousness. Pet. 60–61; *KSR*, 550 U.S. at 418; *Securus Techs.*, 701 F. App'x at 976; *Microsoft*, 662 F. App'x at 990; *K-Tec*, 696 F.3d at 1375.

Also, Petitioner's generic assertion that "Lipsker could benefit from Crump's disclosure" is not well-taken because it lacks specificity and is insufficiently supported by evidence. Namely, Petitioner asserts that "Lipsker, in view of Crump's disclosure, can identify adhesive materials that solidify instantly upon emission from the extruder and exposure to UV-light to form free-standing structures with or without the incorporation of a wire." Pet. 61. Lipsker, however, already discloses quick-curing adhesives (Ex. 1001, 3:32), and Petitioner does not explain why the skilled artisan would have been motivated to modify or substitute Lipsker's quick-curing adhesive in favor of a particular adhesive disclosed in Crump. Thus, it is not evident on this record whether Lipsker's process would have benefitted from

Petitioner's proposed modification.

At best, Petitioner's proffered reasons to combine these references amount to assertions of what the skilled artisan could have done, and not what the skilled artisan would have been motivated to do. Pet. 60–61. Such assertions are not enough to demonstrate obviousness. *See Belden Inc. v. Berk-Tek LLC*, 805 F.3d at 1073.

And we again find on this preliminary record that Dr. Rosen's testimony supporting Petitioner's proffered motivations to combine is entitled to little or no weight because the relied-upon portions of Dr. Rosen's Declaration simply parrot Petitioner's conclusory assertions. *Compare* Pet. 60–61, *with* Ex. 1002 ¶¶ 221–224.

For this reason, Petitioner has not established a reasonable likelihood of prevailing with respect to this challenge of claims 5–8.

F. Obviousness over Lipsker and Nikzad (Ground 4)

Petitioner challenges claims 13–19 as obvious over the combined teachings of Lipsker and Nikzad. Pet. 68–81. Each of these claims require "flakes of fiber encased in a primary material" as part of the claimed "composite material" (Ex. 1001, 12:1–3, 17–19), and Petitioner relies on the disclosure of Nikzad to evince such flakes of fiber in a primary material. Pet. 72–73, 77. Petitioner relies on Lipsker for the remaining limitations of independent claims 13 and 17, and asserts that it would have been obvious to combine the teachings of Lipsker and Nikzad because, *inter alia*, Nikzad's fiber fillers may "improve the mechanical properties of the resulting composite material, such as [its] stiffness." *Id.* at 69; *see also id.* at 73 ("A POSITA would have understood that fiber flakes, similar to the iron fibers disclosed by Nikzad, can be added to the adhesive disclosed by Lipsker to

increase the tensile modulus and strength of the resulting composite path."); *see also* Ex. 1009, 64 ("Reinforcing fillers can very well be used in accordance with the macromolecular mixtures to increase the modulus and strength of polymeric matrices.").

Patent Owner argues that Petitioner has improperly relied on multiple embodiments of Lipsker in this challenge, and that the Petition "fail[s] to articulate, with sufficient particularity, any reason with rational underpinning that a POSITA would have modified or combined teachings from different embodiments of Lipsker to arrive at the claimed subject matter." Prelim. Resp. 22.

We disagree with Patent Owner here for the same reasons we disagreed with Patent Owner with respect to Ground 1 over Lipsker alone. *See* Section II.D, *supra*. In Ground 1, Petitioner relied on Lipsker's non-precoating actuator in Figure 2 to evince the preamble and a distinct precoating embodiment in Figure 5 to evince the emitting step. Pet. 23–26. Here, Petitioner adopts the same approach. *See id.* at 70 ("The preamble of Claim 13 is identical to the preamble of Claim 20, which Lipsker discloses in Ground 1."); *id.* at 72 ("Element 13[a] is substantially similar to Element 20[a], which Lipsker discloses in Ground 1."); *id.* at 77 (relying on 13[pre] and 13[a] to evince 17[pre] and 17[a], respectively). And as with Ground 1, Patent Owner makes no attempt to argue that the preambles of claims 13 and 17 are limiting. *Allen Eng'g* , 299 F.3d at 1346; *Catalina Mktg.*, 289 F.3d at 809. Therefore, on this preliminary record, we are unpersuaded that Petitioner improperly mixed and match embodiments of Lipsker as argued. Prelim. Resp. 19–22.

Patent Owner also argues that Petitioner failed to ascertain the differences between the prior art and the claims and failed to explain why the claims would have been obvious despite those differences. Prelim. Resp. 35–36. That argument is unpersuasive at this stage of the proceeding. We find Petitioner's assertions and citations to evidence sufficient to evince the claimed limitations. Pet. 68–81. And although Petitioner repeats several motivational statements that we have thus far found insufficient (*id.* at 68–69), Petitioner goes farther here. In particular, Petitioner asserts that Lipsker's adhesive may have improved stiffness if it contains Nikzad's fiber fillers. *Id.* at 69. And, significantly, Petitioner provides evidentiary support for that assertion. *Id.* at 73 (citing Ex. 1002 ¶¶ 232–33). Notably, Dr. Rosen's testimony here does not simply parrot the Petition's language; it quotes a specific passage from Nikzad which states a known benefit of using a reinforcing filler in a polymeric matrix.[4] Ex. 1002 ¶ 232 quoting Ex. 1009, 64.

Therefore, upon reviewing Petitioner's assertions and associated citations to evidence, we determine that Petitioner has demonstrated a reasonable likelihood that it would prevail with respect to its challenge of claims 13–19 over the combined disclosures of Lipsker and Nikzad.

F. Obviousness of claims 1, 2, 9, 10, and 21 over Ma (Ground 5)

We begin by noting that some of the challenged claims require the path of composite material to be pulled out of the extruder (claims 1, 2) or

[4] Lipsker identifies "polymers" as one possible adhesive. Ex. 1006, 3:32–38.

"moving the extruder during emission to generate tension in the path of composite material" (claims 9, 10).

Petitioner's reliance on Ma to evince these limitations ignores a myriad of teachings within Ma that criticize or discredit the passive method of supplying material. *See* Prelim. Resp. 14–16 (identifying eight instances within Ma that teach away from this method). For that reason alone, we are not persuaded on this preliminary record that Petitioner establishes a reasonable likelihood of prevailing with respect to this challenge of claims 1, 2, 9, and 10.

Regarding claim 21, Petitioner relies on its assertions set forth in Ground 2. Pet. 83, 57–60. There, Petitioner details where in Ma each of the claimed steps are disclosed.

Patent Owner's arguments with respect to this challenge do not address Petitioner's assertions with respect to claim 21. Rather, Patent Owner argues limitations germane to claims 1 and 9. Prelim. Resp. 22–25.[5]

Therefore, upon reviewing Petitioner's assertions and associated citations to evidence, we determine that Petitioner has demonstrated a reasonable likelihood that it would prevail with respect to its challenge of claim 21 over Ma.

[5] Although Patent Owner identifies Petitioner's reliance on Ma's Figure 2-5 for limitation 21[a], Patent Owner does not argue that Ma's Figure 2-19 was relied on by Petitioner for any other limitation in claim 21. We, therefore, disagree with Patent Owner's statement that Petitioner relied on an "improper multi-embodiment analysis of Ma" for claim 21. Prelim. Resp. 25.

G. Obviousness of claims 5 and 6 over Ma and Crump (Ground 7) and claims 7 and 8 over Ma, Crump, and Lipsker (Ground 8)

We begin by noting that each of these challenged claims require "moving the extruder during emitting such that the path of composite material extends from an anchor." Ex. 1001, 11:15–16. The '708 patent explains that "[t]he origin of the path adheres to the anchor, allowing the extruder to pull on the secondary material during the extrusion." *Id.* at 10:7–9. Such "pulling" action is seemingly disparaged and criticized in Ma, and Petitioner has not explained why the skilled artisan would have ignored those teachings and arrived at the claimed subject matter despite those teachings. This reason alone is sufficient for us to find on this preliminary record that Petitioner has not established a reasonable likelihood of prevailing as to these challenges.

In addition, Petitioner provides similar motivations to combine the references that we have already found insufficient (Pet. 87–88, 92–93), and we find these proffered motivations deficient here for similar reasons. For example, Petitioner again asserts that the references are in the same field of additive manufacturing of three-dimensional objects. *Id.* at 87, 92. Even if true, that is not enough to establish that a skilled artisan would have been motivated to combine those references' teachings. *Securus Techs.*, 701 F. App'x at 976; *Microsoft*, 662 F. App'x at 990. Petitioner also provides a vague and generic assertion that the skilled artisan "would have found that Crump introduces additional methods and material considerations," without detailing what, precisely, those methods and materials would be. Pet. 87. Notably, and as Petitioner acknowledges, Ma already discloses that the "towpreg is heated or is exposed to energy . . . and is quickly solidified and allowed to adhere to the previous layer," and that "[a]ll the deposition and

adhering procedures for a towpreg segment could be finished in a short time (*0.01-0.1* Second)." *Id.*; Ex. 1007, 58–60.[6] Thus, it is unclear on this preliminary record why the skilled artisan would have a need to consult Crump's disclosure regarding specific adhesives.

In sum, Petitioner has not demonstrated, at this stage of the proceeding, a reasonable likelihood of prevailing on its challenges of claims 5–8 over Ma and Crump or Ma, Crump, and Lipsker.

H. Obviousness of claims 13 and 14 over Ma and Nikzad (Ground 9) and claims 15–19 over Ma, Nikzad, and Lipsker (Ground 10)

For these challenges, Petitioner relies on Nikzad in a similar manner as set forth in Ground 4, i.e., for the claim limitation regarding "flakes of fiber encased in a primary material." Pet. 96–97.

However, on this preliminary record, we have concerns about the sufficiency of Petitioner's information directed to the alleged reasons to combine the teachings of Ma and Nikzad (Ground 9) or the teachings of Ma, Nikzad, and Lipsker (Ground 10).

With respect to Ground 9, Petitioner repeats its assertion that these references are in the same field of endeavor, which is insufficient for reasons we have identified *supra*. Pet. 94–95; *see also id.* at 99 (relying on the four motivations set forth with respect to Ground 2 at pages 34–36). Then, Petitioner asserts without sufficient specificity or citation to evidence[7] that

[6] Unlike Petitioner, we cite to the Exhibit page number, not the page number of the underlying thesis. Pet. 87.

[7] We accord little to no weight to Dr. Rosen's testimony cited by Petitioner here because it merely parrots the Petition and, distinct from Ground 4, fails to cite with specificity to Nikzad. *Compare* Pet. 95, *with* Ex. 1002 ¶ 325.

"Nikzad presents additional details about types of fillers that can be incorporated in matrix materials to improve the mechanical properties of the resulting composite material." *Id*. at 95. Petitioner then states that "applying the teachings of Nikzad in Ma does not require substantial changes or modifications," and that the combination "would yield predictable results." *Id*. Those assertions are insufficient to establish that the skilled artisan would have been motivated to combine the teachings of Ma and Nikzad because it, too, lacks specificity and citation to evidence.

For Ground 10, Petitioner relies on the motivations from Grounds 2 and 9, each of which we have found insufficient.

Thus, on this preliminary record, Petitioner has not established a reasonable likelihood of prevailing on these challenges of claims 13–19.

I. Discretion under 35 U.S.C. § 325(d)

Patent Owner argues that we should exercise our discretion under 35 U.S.C. § 325(d) to deny institution. Prelim. Resp. 41–52. We decline to deny under § 325(d). "Under § 325(d), the art and arguments must have been previously presented to the Office during proceedings *pertaining to the challenged patent*." *Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 (PTAB February 13, 2020) (precedential), 7 (emphasis added).

Patent Owner presents arguments regarding prosecution history of a different patent[8] than that challenged here without explaining adequately how or why that prosecution history supports a discretionary denial in this

[8] US 9,511,543, issued December 6, 2016 ("the '543 patent"). The '543 patent is listed in the chain of priority on the challenged patent. Ex. 1001, code 60.

proceeding. Prelim. Resp. 41–52. Notably, Patent Owner's arguments pertain to the '543 patent's allowance over the Jang reference which is purportedly similar to the Ma reference relied on by Petitioner in the challenge of the '708 patent. *Id.* Each of the allowed claims in the '543 patent require "pulling" the path of composite material from the extruder or a similar limitation, and the Examiner expressly stated that the applied "prior art references do not teach" such limitations. Ex. 2003, 420–21. Challenged claims 13–21 of the '708 patent, however, require no such pulling. Ex. 1001, 20. Thus, it is not immediately apparent why purportedly similar art applied in the prosecution history of the '543 patent (i.e., Jang) should merit a denial under §325(d) here.

J. Discretion under 35 U.S.C. § 314(a)

Patent Owner also argues that the Board should exercise its discretion to deny institution under 35 U.S.C. § 314(a) based on the *Fintiv*[9] factors. Prelim. Resp. 52–54. Petitioner argues the opposite. Pet. 5–7.

Our analysis is informed not only by the *Fintiv* factors, but also the Director's "Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation" issued June 21, 2022 ("Interim Procedure").[10] This Interim Procedure provides "binding agency guidance" regarding how the Board's discretion under 35 U.S.C. § 314(a) and the *Fintiv* factors apply to "sample fact patterns." Interim Procedure at

[9] *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 6 (PTAB Mar. 20, 2020) (precedential) ("*Fintiv*").

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

3.

1. Factor 1: Whether a Stay Exists or Is Likely to be Granted if a Proceeding is Instituted

Neither party asserts that the district court has granted a stay of the parallel proceeding, and neither party provides evidence that one may be granted if we institute trial here. Petitioner asserts, however, that it "intends to file a motion to stay litigation." Pet. 5.

We decline to engage in what would amount to a speculative exercise as to how the district court would treat Petitioner's motion to stay at some future time—if Petitioner indeed files its motion—and then give such speculation weight in our overall determination whether to exercise our discretion to institute trial. *Cf. Sand Revolution II, LLC v. Cont'l Intermodal Grp.–Trucking LLC*, IPR2019-01393, Paper 24, 7 (PTAB June 16, 2020) (informative) ("*Sand Revolution*"), at 7

> In the absence of specific evidence, we will not attempt to predict how the district court in the related district court litigation will proceed because the court may determine whether or not to stay any individual case, including the related one, based on a variety of circumstances and facts beyond our control and to which the Board is not privy.

Apple Inc. v. Fintiv, Inc., IPR2020-00019, Paper 15, 12 (PTAB May 13, 2020) (informative) ("*Fintiv II*") ("We decline to infer, based on actions taken in different cases with different facts, how the District Court would rule should a stay be requested by the parties in the parallel case here. This factor does not weigh for or against discretionary denial in this case").

Thus, we view this factor as neutral.

2. Factor 2: Proximity of the Court's Trial Date to the Board's Projected Statutory Deadline

Petitioner asserts that the district court has tentatively scheduled trial to start after December 11, 2023. Pet. 5. Evidence submitted by Patent Owner corroborates that statement. Ex. 2005, 12. That date is over one month after our statutory deadline for entering a final written decision in this proceeding if instituted. The parties do not provide any time-to-trial statistics for our consideration. *See* Interim Procedure 8–9 (instructing the Board to consider such evidence when presented).

"If the court's trial date is at or around the same time as the projected statutory deadline . . . the decision whether to institute will likely implicate other factors discussed herein, such as the resources that have been invested in the parallel proceeding." *Fintiv*, 9. Additionally, the Interim Procedure notes that "[a] court's scheduled trial date . . . is not by itself a good indicator of whether the district court trial will occur before the statutory deadline for a final written decision." Interim Procedure, 8.

Because of the close proximity between our statutory date and the district court's projected trial date, we treat this factor as neutral.

3. Factor 3: Investment in the Parallel Proceeding by the Court and Parties

Petitioner argues this factor weighs against us exercising our discretion to deny institution because there has not been "substantive investment by the Court," and "[f]act discovery does not close until October 21, 2022," and "[t]he parties have not yet exchanged invalidity contentions." Pet. 6.

Patent Owner does not address the district court's investment, but argues that "[t]he parties have invested significantly," and states that

"Plaintiff produced the file history of the asserted patent[] and identified the accused products in February 2022." Prelim. Resp. 52. According to Patent Owner, "[i]n March 2022, Defendant produced technical documents related to the accused product," and "[i]n April and May 2022, the parties produced initial infringement and invalidity contentions," and "are now investing in preparing final invalidity contentions, final infringement contentions, final validity contentions, and final noninfringement contentions" which are due in November 2022. *Id.*

We determine that this factor weighs somewhat against us exercising our discretion to deny institution. Pet. 6. The deadline for fact discovery is November 30, 2022, expert reports are not yet due, and substantive motion practice has yet to begin. Ex. 2005. Therefore, although the parties have invested some effort in the parallel district court proceeding, the majority of the work to prepare the invalidity case for trial remains to be done. *Id.* We also acknowledge here Petitioner's diligence in filing the Petition less than 10 months after being served the complaint. Ex. 1013, Pet. 6.

4. Factor 4: Overlap Between Issues Raised in the Petition and in the Parallel Proceeding

Petitioner asserts that this factor weighs against us exercising our discretion to deny institution because the Petition challenges claims 1–21 of the '708 patent, whereas the parallel proceeding asserts four of these claims, i.e., claims 1, 5, 9, and 21. Pet. 6. Patent Owner points to the absence of a *Sotera* stipulation by Petitioner, and furthermore notes that, in the parallel proceeding, Petitioner relies on Lipsker, Ma, Nikzad, and Crump, "among others." Prelim. Resp. 53; *see Sotera Wireless, Inc. v. Masimo Corp.*, IPR202-01019, Paper 12 (PTAB Dec. 1, 2020) (precedential as to § II.A).

We agree with Petitioner and determine that this factor weighs against us exercising our discretion to deny institution. Even though Petitioner has not made a *Sotera* stipulation and relies on the same references in the parallel proceedings as in its Petition, there are seventeen (17) additional claims challenged in the Petition than in the parallel proceeding. That fact alone minimizes the potential overlap between the issues raised here vis-à-vis those raised in the parallel proceeding

5. Factor 5: Whether the Petitioner and the Defendant in the Parallel Proceeding Are the Same Party

The Petitioner here is the Defendant in the parallel proceeding. Pet. 1. This fact could weigh either in favor of, or against, exercising discretion to deny institution, depending on which tribunal was likely to address the challenged patent first. As with other factors, however, we decline to speculate as to whether we are more likely to address the challenged patent before the district court. *See Google, Inc. v. Parus Holdings, Inc.*, IPR2020-00847 (PTAB October 21, 2020), Paper 9 at 20. We, therefore, treat this factor as neutral.

6. Factor 6: Other Circumstances that Impact the Board's Exercise of Discretion, Including the Merits

Petitioner asserts that it "has provided herein strong bases for unpatentability." Pet. 7. Patent Owner disagrees. *See* Prelim. Resp. 54 ("Here, the Petition is weak and unlikely to prevail on the merits.").

"*Fintiv* factor 6 reflects that the PTAB considers the merits of a petitioner's challenge when determining whether to institute a post-grant proceeding in view of parallel district court litigation." Interim Procedure at 4. According to the Interim Procedure, discretionary denial based on the

Fintiv factors is disallowed when Petitioner presents a "compelling unpatentability challenge." *Id.* at 4–5. In this case, however, it is unnecessary for us to reach whether Petitioner's challenges here are "compelling" because the other *Fintiv* factors do not, on balance, favor exercising our discretion to deny institution.

We also observe under this factor our mission "to improve patent quality and restore confidence in the presumption of validity that comes with issued patents." *Cuozzo Speed Techs., LLC v. Lee*, 579 U.S. 261, 272 (2016). Exercising our discretion to deny institution here—where Petitioner has established a reasonable likelihood of prevailing on nine out of twenty-one claims—would not further the Board's mission.

Thus, we determine that *Fintiv* factor 6 weighs against us exercising our discretion to deny institution.

7. Balancing the Fintiv Factors

We have considered the circumstances and facts before us in view of the *Fintiv* factors and the Interim Procedure, and we determine that the circumstances presented here do not support exercising our discretion under § 314(a) to deny institution. Specifically, Factors 1, 2, and 5 are neutral, and Factors 3, 4, and 6 weigh against us exercising our discretion.

Thus, we decline to exercise our discretion to deny institution under § 314(a).

K. Notices

The Board shall deem waived any issue not raised in a timely response to the Petition, or as permitted in another manner during trial, even if asserted in the Preliminary Response or discussed in this Decision. Nothing in this Decision authorizes Petitioner, in a manner not otherwise

permitted by Board rules, to supplement the information pertaining to any ground advanced in the Petition.

After considering the evidence and arguments presented in the Petition, we institute an *inter partes* review of all challenged claims on all grounds presented. Despite our conclusion that Petitioner has not demonstrated a reasonable likelihood of prevailing on certain claims and grounds, current practice dictates that this review will include all challenged claims and grounds. *See SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1355 (2018) (noting that the language of 35 U.S.C. § 314(b) "indicates a binary choice—either institute review or don't").

IV. ORDER

It is

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–21 of the '708 patent is instituted;

FURTHER OREDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of trial.

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