

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MARKFORGED INC.,

Petitioner,

v.

CONTINUOUS COMPOSITES, INC.,

Patent Owner.

IPR2022-00732

Patent 10,759,109 B2

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

McGEE, *Administrative Patent Judge*.

DECISION

Denying Institution of *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 1–15 of U.S. Patent No. 10,759,109 B2 (Ex. 1001, “the ’109 patent”).

Patent Owner filed a Preliminary Response (Paper 6, “Prelim. Resp.”), along with a Disclaimer under 37 C.F.R. § 1.321(a) of claims 10–15 of the ’109 patent (Ex. 2009). 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 and IPR2022-00652, as well as pending US Patent Applications 16/946,469, 17/481,147, 17/453,309, and 17/453,313 as related matters. Paper 5, 1.

II. BACKGROUND

A. The ’109 Patent (Ex. 1001)

The ’109 patent relates to “[a] method and apparatus for the additive manufacturing 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 ’109 patent, this “method is called Continuous Composite Three-Dimensional Printing (CC3D).” *Id.* at 2:12–13.

The ’109 patent indicates that the primary material is a curable liquid, such as a photosensitive resin, and the secondary material is a solid strand, 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,” creating a composite material. *Id.* at 2:28–30.

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:

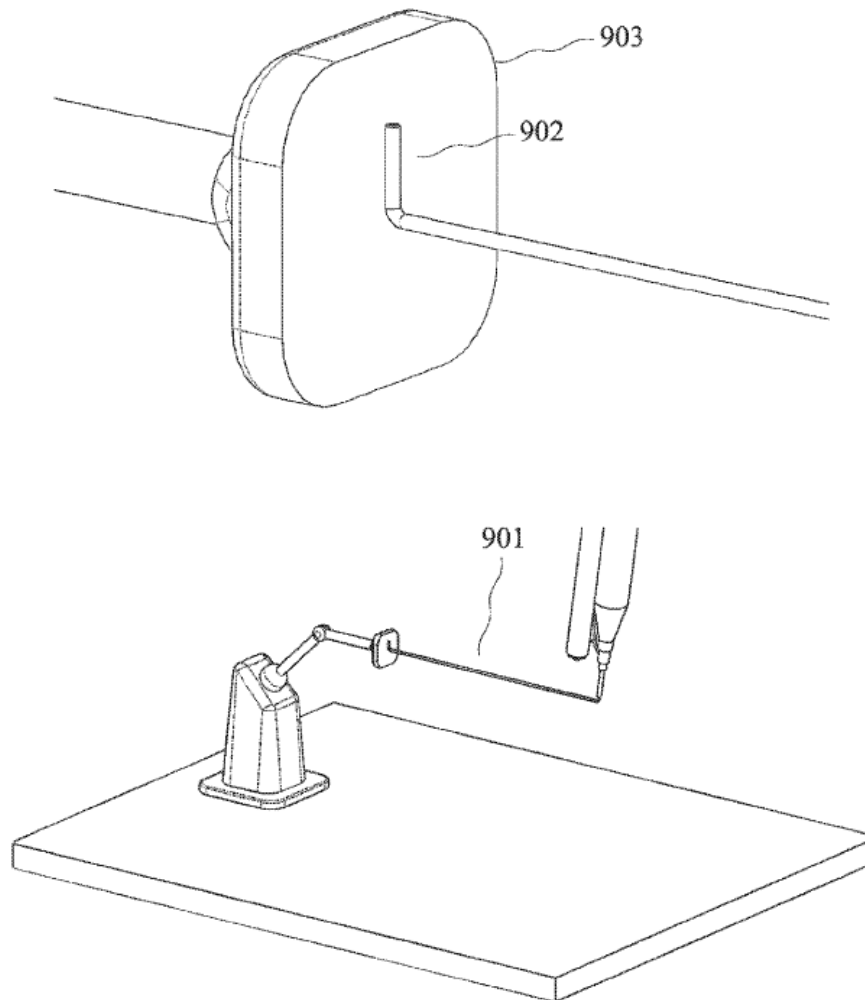


Fig. 9

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 claim 1, which is the only independent claim challenged and illustrates the subject matter of the invention.

1. An apparatus for additively manufacturing of a three-dimensional object, comprising:
 - an extruder configured to emit a continuous strand encased in a primary material, the continuous strand including at least one of a fiber and a wire; and
 - at least one of a robot arm and a gantry system configured to move the extruder during emission such that the continuous strand is pulled from the extruder by the movement during at least a portion of the manufacturing of the three-dimensional object.

Ex. 1001, 10:58–10:67.

C. Grounds of Unpatentability Asserted in the Petition

Petitioner advances several grounds of unpatentability asserting that the subject matter of claims 1–9¹ would have been obvious under 35 U.S.C. § 103(a)² as set forth in the following table.

¹ In view of Patent Owner’s disclaimer of claims 10–15 (Ex. 2009), we agree with Patent Owner that Petitioner’s proposed grounds 1 and 4 are moot and ground 2 is partially moot. *See* Prelim. Resp. 21. Our table, therefore, reflects the current state of Petitioner’s challenges, i.e., after Patent Owner’s disclaimer of claims 10–15.

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

Claims Challenged	Statutory Basis §	Reference(s)
1–9	103(a)	Lipsker, ³ Ma ⁴
1–9	103(a)	Lipsker, Wohrl ⁵
1–9	103(a)	Ma, Wohrl
1–9	103(a)	Ma, Lipsker

Pet. 16. Petitioner relies on the Declaration of Dr. David Rosen (Ex. 1002) in support of its challenges.

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). Our findings and conclusions set forth in this Decision are provided for the exclusive purpose of explaining our determination that Petitioner has not met that standard on this record.

the ’109 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.

³ US 6,153,034, issued November 28, 2000 (Ex. 1008).

⁴ Erjian Ma, *Solid Freeform Fabrication of Continuous Fiber Reinforced Composite Materials* (August 6, 2001) (Ph.D. dissertation, Auburn University) (UMI Number 3016100) (Ex. 1007)

⁵ Wohrl, UK Patent App. GB 2213 793 A, published Aug. 23, 1989 (Ex. 1006).

A. Overview of the Prior Art

1. Lipsker (Ex. 1008)

Lipsker is directed “to rapid prototype deposition modeling techniques and apparatus.” Ex. 1008, 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.

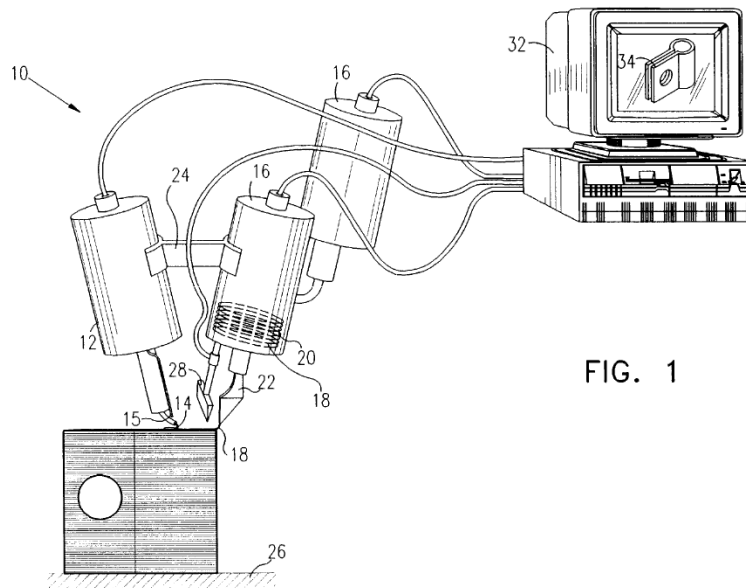


Figure 1 is simplified pictorial illustration of a rapid prototype apparatus described in Lipsker. Ex. 1008, 2:65–67. Prototype apparatus 10 includes adhesive dispenser 12 for dispensing adhesive 14 and wire dispenser 16 for dispensing wire 18. *Id.* at 3:27–28, 3:46–47. Wire 18 is stored within storage receptacle 20 and dispensed through nozzle 22 onto bed 26. *Id.* at 3:47–49, 3:56. 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. 1008, 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 only by “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, “[t]he 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. *Wohrl (Ex. 1006)*

Wohrl relates to the manufacture of a three-dimensionally twisted airfoil of a rotor blade. Ex. 1006, code (57). Wohrl explains that technical problems are encountered “in the manufacture of fibre-reinforced

components of complex shapes with three-dimensionally twisted surfaces, especially if these take a partially concave form and if the requirements are for different strength and vibration properties in different directions,” and “[c]onventional manufacture of these components is associated with considerable effort involving high manufacturing costs.” *Id.* at 1:18–23, 2:1–3. Wohrl seeks “to enable the manufacture of” such fibre-reinforced components “by a simple and rapid method that permits selective manipulation of component properties by selective routing of the fibres and more particularly so as to permit ready application of fibres also to concave surfaces.” *Id.* at 2:10–16.

Wohrl describes a method “wherein fibre strands wetted with a resin matrix are pressed against the core for example, by means of a nip roller, and the resin matrix precured immediately thereafter.” Ex. 1006, 2:17–24. Wohrl teaches that “[f]ibres can be applied in a simple manner, in each and every direction and on any shape of airfoil surface and so that they will then adhere and not subsequently be dislodged.” *Id.* at 2:27–3:2. According to Wohrl, after the fibers have precured, they will adhere to concave surfaces and therefore “can be laid rapidly and accurately in position.” *Id.* at 3:2–4.

Wohrl's Figure 1 is reproduced below.

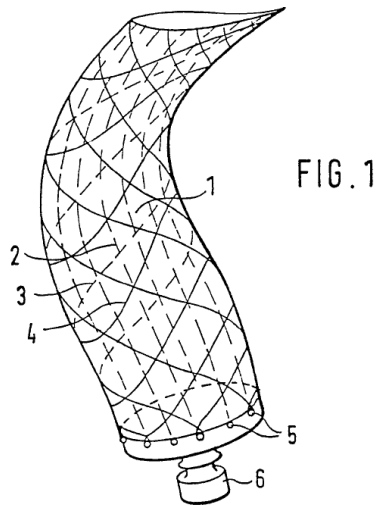


Figure 1 is a perspective view of airfoil 1 of a rotor blade. Ex. 1006, 4:7, 4:12–13. Tensile direction 2 and diagonal layers 3 and 4 illustrate the preferred directions of the fibers to be deposited. *Id.* at 4:13–15. “The fibres are preferably looped around attaching nipples 5 on blade root 6, so as to ensure a satisfactory union between the two components and for good transfer to the blade root 6 of the tensile force arising in operation.” *Id.* at 4:15–19.

Wohrl's Figure 2 is reproduced below.

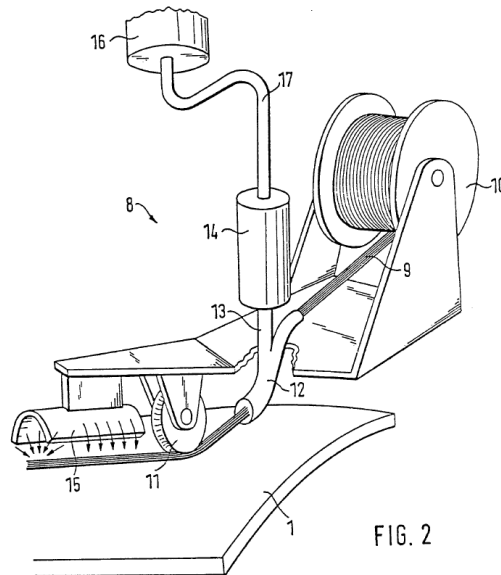


Figure 2 is a perspective view of a fiber laying device described in Wohrl. Ex. 1006, 4:8–9. Fiber laying device 8 includes fiber drum 10, fiber feed duct 12 leading to fiber nip roll 11, and precuring facility 15. *Id.* at 4:20–23. Fiber strand 9 unwound from fiber drum 10 is pulled by nip roll 11 through fiber feed duct 12. *Id.* at 4:23–25. Matrix material is supplied from storage container 16 to matrix unit 14 through flexible feed line 17. *Id.* at 4:27–5:1. The matrix material is then fed into feed duct 12 in defined quantities from matrix metering unit 14 through feed duct 13. *Id.* at 4:25–27. The wetted fibers laid on to the component in the desired track under fiber nip roll 11 and are precured by precuring device 15, which causes the surface to dry and stick. *Id.* at 5:3–7. Wohrl explains that, “[i]n this manner, the fibre is fixed to a point where it can be laid on to radiused tracks,” and “further fibre layers can be deposited in any desired orientation over the precured fibres.” *Id.* at 5:7–10.

Wohrl teaches that fiber laying device 8 “is connected to the ‘wrist’ of a six-axis portal robot 10 and can thus—under computer control—deposit

the fibres strand 9 on the component core fully automatically along precalculated tracks.” Ex. 1006, 5:11–16. According to Wohrl, “[t]his makes for very accurate reproducibility (<0.2 mm) of the fibre laying process.” *Id.* at 5:16–17.

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. 15 (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. In any event, for the reasons explained below, even under Petitioner’s definition, Petitioner fails to establish a reasonable likelihood of prevailing at trial with respect to any challenged claim based on the grounds of unpatentability advanced in the Petition.

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 determine that no claim term requires express construction for purposes of this Decision. *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 over Lipsker and Ma*⁶

*1. Petitioner's assertions*⁷

Petitioner asserts that claims 1–9 are unpatentable as obvious based on the combined disclosures of Lipsker and Ma. Pet. 35–54, 86–93. For example, with respect to claim 1, Petitioner relies on each of Lipsker and Ma for their individual disclosures of an apparatus for additively manufacturing a three-dimensional object as claimed. *Id.* at 36–43. Specifically, Petitioner asserts that each of Lipsker and Ma—“alone and in combination”—discloses claim 1’s preamble and element 1[a]. *Id.* at 36–40. Petitioner then asserts that Lipsker in combination with Ma discloses element 1[b]. *Id.* at 40–43.

Petitioner asserts that the skilled artisan “would be^[8] motivated to combine Lipsker with Ma” because these references are in the same field of endeavor. Pet. 35. Petitioner also states that “Ma presents additional information about raw material selection and in[-]depth analysis about the additive manufacturing process, which Lipsker omits in favor of brevity” and asserts that the skilled artisan would find that the teachings of Ma and

⁶ For brevity, we simultaneously address each of Petitioner’s challenges using these references, i.e., Grounds 2 and 6. Pet. 35–54, 86–93.

⁷ We need only identify the parties’ positions relevant to our disposition of Petitioner’s challenges.

⁸ Petitioner misstates the point in time at which obviousness is determined for a patent with an earliest-effective filing date prior to March 16, 2013 such as the ’109 patent. *See* pre-AIA 35 U.S.C. § 103(a) (“A patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole *would have been* obvious *at the time the invention was made* to a person having ordinary skill in the art.” (emphasis added)).

Lipsker do not contradict, but instead complement, each other. *Id.* at 35–36. As such, Petitioner contends that Ma’s teachings would allow the skilled artisan to better understand Lipsker’s teachings. *Id.* at 36. Finally, Petitioner asserts that applying Ma’s teachings to Lipsker “does not require substantial changes or undue experimentation,” and because Ma provides experimental details, combining Lipsker and Ma would yield predictable results. *Id.*

2. *Patent Owner’s arguments*

Regarding Petitioner’s proffered motivations to combine, 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. 23–26. Specifically, Patent Owner asserts that “Petitioner relies simultaneously on Lipsker’s non-precoating actuator embodiment of Figure 2” for claim 1’s preamble, “on Lipsker’s distinct precoating actuator embodiment of Figure 5 for” limitation 1[a], and “yet another Lipsker embodiment of actuator 50 shown in Figure 6” to evince a portion of element 1[b]. *Id.* at 23–25. According to Patent Owner, Lipsker does not link these disparate embodiments one with another, and the skilled artisan would not have combined the non-precoating embodiment of Figure 2 and the precoating embodiment of Figure 5 because they are described in Lipsker as alternative methods of applying adhesive 14 to wire 18. *Id.* at 25–26.

Patent Owner also asserts that Petitioner has similarly failed to provide reasons why the skilled artisan would have combined or modified the different embodiments of Ma. Prelim. Resp. 26–28. For example, Patent Owner argues that “Petitioner relies on different nozzle systems of

Ma for elements 1[pre] and 1[a],” one of which is directed to a two-step method, while the other is used in a one-step method. *Id.* at 27. Patent Owner also contends that Ma does not link its general discussion regarding “self-anchoring theory” to “either of the Ma nozzles on which Petitioner relies.” *Id.* at 28.

Furthermore, Patent Owner asserts that Petitioner failed to articulate sufficient reasons why the skilled artisan would have combined Lipsker and Ma, and “never articulates *any* particular combination of the references *at all*.” Prelim. Resp. 29. According to Patent Owner, the Petition “lacks any discussion of *how* or *why* [the ordinarily skilled artisan] *would* have combined Reference A [Lipsker] with Reference B [Ma] at all, much less in the way required by any claim element.” *Id.* at 30. Patent Owner asserts that even if Lipsker and Ma were considered to be analogous art, this does not mean that the skilled artisan would have combined them “for the sake of it,” i.e., without a specific reason to do so. *Id.* at 31 (citing *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 417, 419 (2007)).

Patent Owner also contends that Petitioner’s second “generic reason” to combine Lipsker and Ma—i.e., that Ma provides more information on a topic than Lipsker—is similarly deficient because it lacks an explanation as to how the skilled artisan would have combined these references to render any claim element obvious. Prelim. Resp. 33. Patent Owner also argues that “[e]ven if Ma disclosed the additional details Petitioner alleges, [Petitioner does] not provide a reason to modify Lipsker’s pushing system to move a robotic arm and/or gantry to ‘pull’ as required” by the claims. *Id.* at 34.

Patent Owner also contends that Petitioner’s third “generic reason” to combine the Lipsker and Ma references amounts to what an ordinarily

skilled artisan could have done with a reasonable expectation of success, and fails to address how or why that artisan would have combined the relied-upon reference teachings. Prelim. Resp. 35. Patent Owner contends that “[n]one of Petitioner’s rationale provides motivation relevant to modifying Lipsker to add element 1[b].” *Id.* at 38.

With respect to Petitioner’s reliance on Ma, Patent Owner asserts that “Ma explores ‘two main fabrication processes’ for computer-controlled composite layering manufacturing (CLM):” an “active” method which pushes the composite material from an extruder’s orifice, and a “self-anchoring or ‘passive’” method. Prelim. Resp. 16. “In the passive method, rather than pushing, ‘the object is moved relative to the nozzle during the forming process,’ and the composite material “is pulled out by the object instead of being pushed out by nozzle pressure.” *Id.*

Patent Owner asserts that “Ma extensively criticizes and teaches away from the passive method in favor of the active method,” and concludes “that the passive method was so ‘limited’ that ‘other effective forming methods are highly desired and must be investigated.’” Prelim. Resp. 17. Patent Owner provides eight examples of how it believes Ma discusses drawbacks of the passive method and benefits of the active method. *Id.* at 17–19.

3. Discussion

We agree with Patent Owner that Petitioner fails to demonstrate a reasonable likelihood of prevailing with respect to these challenges of claims 1–9.

First, even if we were to agree with Petitioner that Lipsker and Ma are in the same field of endeavor, that fact alone would be insufficient to demonstrate that the ordinarily skilled artisan would have been motivated to

combine these references at the time of the invention. Indeed, our reviewing court has held that merely asserting that two references are drawn from the same field of art is “simply too conclusory” to show that an ordinarily skilled artisan would have combined the references in the way of the claimed invention. *Securus Techs., Inc. v. Glob. Tel*Link Corp.*, 701 F. App’x 971, 976 (Fed. Cir. 2017); *see Microsoft Corp. v. Enfish, LLC*, 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* an ordinarily skilled artisan would have been motivated to combine these references even if they are in the same or similar fields. Prelim. Resp. 31. Petitioner fails to do so on this record. The absence of such reasoning is particularly noteworthy here in view of Ma’s numerous teachings against the “passive” method of pulling the composite

strand from the extruder as claimed. 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. 17–19 (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 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 lacks an explanation as to what specific disclosures in Lipsker and Ma would have been combined and for what reason(s). Instead, Petitioner provides little more than a conclusory assertion that Ma contains complementary teachings that would illuminate the skilled artisan’s understanding of Lipsker. Pet. 36. Petitioner, however, fails to provide a single citation to Ma in support of its position, much less an explanation regarding how Ma’s teachings would have enlightened the skilled artisan’s understanding of Lipsker such that it would have been obvious to arrive at the claimed subject matter. Bare assertions such as these fall far 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).

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 ordinarily skilled artisan would have combined the teachings of these references to arrive at the claimed subject matter.

Finally, we determine that Dr. Rosen’s testimony supporting Petitioner’s proffered motivations to combine is entitled to little or no weight. Prelim. Resp. 30 (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, 86, *with* Ex. 1002 ¶¶ 169–174, 280.

For these reasons, Petitioner does not establish a reasonable likelihood of prevailing with respect to this challenge of claims 1–9.

E. Obviousness over Lipsker and Wohrl

1. Petitioner’s assertions

Petitioner asserts that claims 1–9 are unpatentable as obvious based on the combined disclosures of Lipsker and Wohrl. Pet. 59–75. For example, with respect to claim 1, Petitioner contends that Lipsker discloses the preamble, and that both Lipsker and Wohrl—“alone and in combination”—disclose limitation 1[a]. Pet. 61–63. Petitioner asserts that Lipsker in combination with Wohrl discloses limitation 1[b]. *Id.* at 63–66.

According to Petitioner, a person of ordinary skill in the art would be^[9] motivated to combine the teachings of Lipsker and Wohrl because the methods disclosed in these references “share fundamental similarities,” e.g., “utilize means to cure the curable material and have these means aimed at the composite material as [it] is extruded” where “the means for curing the adhesive or resin matrix material are attached to the extruder and move with

⁹ Here, Petitioner again misstates the point in time at which obviousness is determined, i.e., at the time the invention was made. Pre-AIA 35 U.S.C. § 103(a).

the extruder.” Pet. 59–60. Petitioner asserts that the methods in Lipsker and Wohrl each form “anchor points as the composited material is laid down and cured.” *Id.* at 60.

Petitioner contends that the skilled artisan “would be motivated to look into Wohrl because Wohrl discloses aspects of the formation process that are omitted from Lipsker[]” which would enlighten the skilled artisan’s understanding of Lipsker’s disclosure. Pet. 60. Petitioner also asserts that the similarities of the methods disclosed in Lipsker and Wohrl would allow the teachings of Wohrl to be “seamlessly applicable to Lipsker, such as the use of anchor points in the process of pulling the wire from” Lipsker’s wire dispenser, and that applying Wohrl’s teachings to Lipsker “would not require substantial changes or undue experimentation.” *Id.*

2. *Patent Owner’s arguments*

Patent Owner challenges Petitioner’s proffered motivations to combine these references. Prelim. Resp. 23–26, 32, 34, 36–38. Namely, Patent Owner argues that Petitioner has provided no reason to combine the disparate embodiments of Lipsker, and has also failed to explain why the skilled artisan would have combined Lipsker’s teachings with those of Wohrl. *Id.* at 23–26, 32. Patent Owner asserts that the skilled artisan, starting with Lipsker, would not have been motivated to look to Wohrl for more details regarding pulling because “this is irrelevant in Lipsker’s system.” *Id.* at 34. Patent Owner asserts that, even if Petitioner is correct that Wohrl could improve the skilled artisan’s understanding of Lipsker, “Petitioner does not show how having an improved understanding of Lipsker would have motivated a POSITA to combine Lipsker and Wohrl.” *Id.* Patent Owner also notes that Petitioner’s reference to ““undue

experimentation’ is irrelevant” because this ground is based on obviousness, which “[a]t best . . . allege that a POSITA *could* have combined Lipsker and Wohrl in some unarticulated way.” *Id.* at 36–37.

Patent Owner also asserts that Wohrl is non-analogous art. *Id.* at 40. Patent Owner also challenges Petitioner’s assertion that Wohrl’s robotic arm or gantry system pulls the fiber. *Id.* at 46–50.

3. Discussion

We agree with Patent Owner that Petitioner fails to demonstrate a reasonable likelihood of prevailing with respect to this challenge of claims 1–9.

Namely, we agree with Patent Owner that Petitioner fails to articulate with sufficient specificity why the skilled artisan would have been motivated to combine the teachings of Lipsker and Wohrl. Prelim. Resp. 23–26, 32, 34, 36–38. As we found with Petitioner’s challenges based on Lipsker and Ma, Petitioner’s identification of similarities between Lipsker and Wohrl is not sufficient, by itself, to support a conclusion of obviousness. Pet. 59–60; *KSR*, 550 U.S. at 418; *Securus Techs., Inc. v. Glob. Tel*Link Corp.*, 701 F. App’x at 976; *Microsoft v. Enfish*, 662 F. App’x at 990; *K-Tec v. Vita-Mix*, 696 F.3d at 1375. At best, Petitioner’s proffered reasons to combine these references amount to an assertion of what an ordinarily skilled artisan could have done—not what that artisan would have been motivated to do. Pet. 59–60. 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).

For these reasons, Petitioner does not establish a reasonable likelihood of prevailing with respect to this challenge of claims 1–9.

F. Obviousness over Ma and Wohrl

Petitioner challenges claims 1–9 as obvious over the combined teachings of Ma and Wohrl, and relies on the same or similar reasons to combine these references as discussed *supra*. Namely, Petitioner relies on purported “fundamental similarities” between the methods disclosed in Wohrl and Ma. Pet. 78–79. Petitioner asserts that the skilled artisan “would be motivated to look into Wohrl because Wohrl discloses configuration details that are omitted from Ma’s description, such as the disclosure of robotic arms and gantry systems used to control” the extruder’s movement during emission. *Id.* Petitioner asserts that the skilled artisan “could use Wohrl’s disclosure to envision ways on how to control the movement of Ma’s extruder.” *Id.* at 79.

We find Petitioner’s reasons to combine these references insufficient to demonstrate a reasonable likelihood of prevailing in its challenge of claims 1–9 as obvious over the combined teachings of Wohrl and Ma, just as those reasons were unsatisfactory in Petitioner’s other challenges. *KSR*, 550 U.S. at 418; *Securus Techs., Inc. v. Glob. Tel*Link Corp.*, 701 F. App’x at 976; *Microsoft v. Enfish*, 662 F. App’x at 990; *K-Tec v. Vita-Mix*, 696 F.3d at 1375.

Additionally, as we found with our analysis with respect to the other grounds that include Ma, we find Petitioner’s silence regarding Ma’s numerous teachings against the “passive” method noteworthy. Ex. 1007, 53, 95–96, 98–107, 143–147, 149, 167–168. As we observed *supra*, in the absence of an explanation from Petitioner, we are not persuaded that the

skilled artisan would have ignored those teachings and selected Ma's pulling method.

In sum, Petitioner does not show a reasonable likelihood of prevailing with respect to any challenged claim.

IV. CONCLUSION

Based on the information presented in the Petition and the Preliminary Response, we deny the Petition and do not institute an *inter partes* review.

V. ORDER

It is

ORDERED that the Petition is *denied* and no *inter partes* review is instituted.

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