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Paper 20
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

RTI SURGICAL, INC.,
Petitioner,

v.

LIFENET HEALTH,
Patent Owner.

Case IPR2019-00571
Patent 6,569,200 B2

Before GEORGE R. HOSKINS, TIMOTHY J. GOODSON, and CHRISTOPHER C. KENNEDY, *Administrative Patent Judges*.

GOODSON, *Administrative Patent Judge*.

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

I. INTRODUCTION

Petitioner RTI Surgical, Inc., filed a Petition (Paper 2, "Pet.") requesting *inter partes* review of claims 1–10, 12, 13, and 15 of U.S. Patent No. 6,569,200 B2 (Ex. 1001, "the '200 patent"). Patent Owner LifeNet Health filed a Preliminary Response. Paper 9 ("Prelim. Resp."). With our authorization, Petitioner filed a Reply (Paper 16), and Patent Owner filed a Sur-Reply (Paper 19).

Pursuant to 35 U.S.C. § 314 and 37 C.F.R. § 42.4(a), the Board has authority to determine whether to institute *inter partes* review. *Inter partes* review may not be instituted unless "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). A decision to institute under 35 U.S.C. § 314 may not institute on fewer than all claims challenged in the petition. *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018).

For the reasons set forth below, we institute *inter partes* review as to all challenged claims of the '200 patent on all grounds presented in the Petition.

A. Related Matters

Patent Owner asserted the '200 patent against Petitioner in *LifeNet Health v. RTI Surgical, Inc.*, No. 3:18-cv-817 (M.D. Fla.), filed June 25, 2018. *See* Pet. 3. That case was transferred to another judicial district and is now captioned as *LifeNet Health v. RTI Surgical, Inc.*, No. 1:18-cv-00146-MW-GRJ (N.D. Fla.). *See* Paper 4, 1.

Previously, the '200 patent was involved in *LifeNet Health v. LifeCell Corp.*, No. 2:13-cv-486 (E.D. Va.) ("LifeCell litigation"). In that case, a jury determined that the defendant failed to establish the invalidity of the

asserted claims by clear and convincing evidence, and the Federal Circuit affirmed. *See LifeNet Health v. LifeCell Corp.*, 837 F.3d 1316 (Fed. Cir. 2016) (Ex. 2002).

At the Board, Patent Owner lists two proceedings as related: Case IPR2019-00572, which challenges U.S. Patent No. 9,579,420 B2 (Ex. 1002, "the '420 patent"), and Case IPR2019-00573, which challenges U.S. Patent No. 9,585,986 B2 (Ex. 1003, "the '986 patent").

B. The '200 Patent

The '200 patent relates to plasticized tissue grafts. *E.g.*, Ex. 1001 at [54] (title). The '200 patent discloses that "[s]oft tissue products are typically provided as fresh-frozen or freeze-dried," which "causes grafts to be brittle and typically causes shrinkage where the shrinkage is not uniform, thereby causing graft failure." *Id.* at 3:38–39, 49–52. The patent further discloses that "solvent preservation . . . can cause irreversible denaturation of proteins, and solubilization of solvent soluble components, including for example, lipids." *Id.* at 3:52–55. According to the '200 patent, typical methods of preparing tissue grafts "necessitate[] a rehydration step . . . for implantation." *Id.* at 3:55–59.

The '200 patent discloses the use of a "plasticizer," such as glycerol, in the preparation of tissue grafts. *E.g.*, *id.* at [57] (abstract), 5:22–27. The plasticizer "replaces water in the molecular structure of the bone or soft tissue matrix . . . allowing for dehydration of the tissue, yet not resulting in an increase in brittleness of the plasticized product, and resulting in compressive and/or tensile properties similar to those of normal hydrated tissue." *Id.* at [57] (abstract). The '200 patent teaches that a benefit of its plasticized tissue graft is that rehydration "prior to clinical implantation" is

not required, and "the dehydrated bone or soft tissue plasticized product can be placed directly into an implant site without significant preparation in the operating room." *Id.*

C. Illustrative Claim

Petitioner challenges claims 1–10, 12, 13, and 15. Of these, claims 1–3 and 7 are independent claims. Claim 1, reproduced below, is illustrative of the challenged claims.

> 1. A plasticized soft tissue graft suitable for transplantation into a human, comprising:
>
> a cleaned soft tissue graft having an internal matrix; and
>
> one or more plasticizers contained in said internal matrix;
>
> said one or more plasticizers are not removed from said internal matrix of said plasticized soft tissue graft prior to transplantation into a human.

Ex. 1001, 24:10–16.

D. Cited References

Petitioner relies on three references for its challenges:

Reference	Patent or Publication No.	Date	Exhibit
Livesey	US 5,336,616	Aug. 9, 1994	1004
Walker	WO 98/07452	Feb. 26, 1998	1005
Werner	US 4,357,274	Nov. 2, 1982	1006

Petitioner also relies on the Declaration of David McQuillan, Ph.D. *See* Ex. 1034.

E. Asserted Grounds of Unpatentability

Petitioner asserts five grounds of unpatentability:

Gr.	Reference(s)	Basis[1]	Claim(s) Challenged
1.	Walker	§ 102(b)[2]	1–3, 5, 7–10, 12, and 15
2.	Walker	§ 103(a)	1–3, 5–10, 12, 13, and 15
3.	Livesey	§ 102(b)	1–3, 7, 8, 10, and 15
4.	Livesey	§ 103(a)	1–3, 7, 8, 10, and 15
5.	Walker or Livesey in view of Werner	§ 103(a)	4

See Pet. 5.

II. DISCRETIONARY DENIAL UNDER § 314(A)

A threshold issue raised by the Preliminary Response is whether we should deny institution under 35 U.S.C. § 314(a). *See* Prelim. Resp. 6–11; *see also* Sur-Reply 2–8. Patent Owner argues that "Petitioner is merely

[1] The relevant sections of the Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112–29, took effect on March 16, 2013. Because the application that issued as the '200 patent was filed before March 16, 2013, we apply the pre-AIA versions of these statutes.

[2] Petitioner asserts that Walker is prior art under § 102(b) because it was published on February 26, 1998. *See* Pet. 20 (citing Ex. 1005, 1). We note that the '200 patent claims the benefit of the filing date of a related application filed on June 30, 1998. *See* Ex. 1001 at [62] (Related U.S. Application Data). If Patent Owner can establish entitlement to that date, Walker would not qualify as prior art under § 102(b), but it may still qualify as prior art under other sections of § 102 unless Patent Owner can antedate the reference. At this stage of the proceeding, Patent Owner has not contested Walker's status as prior art nor offered any evidence to antedate it. Based on the current record, Petitioner has made a sufficient showing for institution purposes that Walker qualifies as prior art, but the parties may develop this issue further during the course of this proceeding.

rehashing the same art that has been rejected by the Office, a district court, and the Federal Circuit based on the subject matter claimed in the '200 patent." Prelim. Resp. 6.

Institution of *inter partes* review is discretionary. Section 314(a) provides that "[t]he Director may not authorize an inter partes review to be instituted unless the Director determines that the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." The Supreme Court has held that because the statute includes no mandate to institute review, "the agency's decision to deny a petition is a matter committed to the Patent Office's discretion." *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2140 (2016); *see also id.* at 2153 (Alito, J., concurring in part and dissenting in part) ("I agree that one can infer from the statutory scheme that the Patent Office has discretion to deny inter partes review even if a challenger satisfies the threshold requirements for review."); *Oil States Energy Servs., LLC v. Greene's Energy Grp., LLC*, 138 S. Ct. 1365, 1371 (2018) ("The decision whether to institute inter partes review is committed to the Director's discretion."). In view of the statutory language and the Supreme Court's precedents, the Federal Circuit has explained that "the Director has complete discretion to decide not to institute review." *Saint Regis Mohawk Tribe v. Mylan Pharms. Inc.*, 896 F.3d 1322, 1327 (Fed. Cir. 2018). The Director has delegated these discretionary institution decisions to the Board. *See* 37 C.F.R. § 42.4(a).

The Board has enumerated factors that guide its discretion as to whether to deny institution under § 314(a). *See* Trial Practice Guide Update

23–25 (July 2019)[3] (discussing *General Plastic Co. v. Canon Kabushiki Kaisha*, Case IPR2016-01357, slip op. 15–16 (PTAB Sept. 6, 2017) (Paper 19) (precedential)). We do not address the *General Plastic* factors because the parties' arguments concerning discretionary denial do not discuss those factors, which are generally geared to the context of a "follow-on" petition challenging the same patent as was challenged previously in another Board proceeding. *See id.* The Office's guidance advises that the *General Plastic* factors are not exclusive but are "part of a balanced assessment of all relevant circumstances in the case, including the merits." *Id.* at 25. For example, "events in other proceedings related to the same patent, either at the Office, in district courts, or the ITC" may weigh in favor of denying a petition. *Id.* (citing *NHK Spring Co. v. Intri-Plex Techs., Inc.*, Case IPR2018-00752 (PTAB Sept. 12, 2018) (Paper 8) (precedential)).

Patent Owner urges that denial of the Petition is warranted based on the LifeCell litigation and the prosecution histories of the '420 and '986 patents, which are related to the '200 patent.[4] Prelim. Resp. 6–11; Sur-Reply 2–9. In particular, Patent Owner points out that in the LifeCell litigation, the '200 patent was upheld against validity challenges that relied on Livesey and Werner, two of the references at issue here. *See* Prelim. Resp. 9–10. Patent Owner also relies on its submission to the Examiner,

[3] *Available at* www.uspto.gov/sites/default/files/documents/trial-practice-guide-update3.pdf.

[4] Specifically, the'200 patent appears to share the same specification as the '420 and '986 patents and all three patents claim the benefit of the filing date of the same ancestor application, U.S. Patent App. No. 09/107,458. *See* Ex. 1001, at [62]; Ex. 1002, at [60]; Ex. 1003, at [60].

during the prosecution of the related '420 and '986 patents, of materials from the LifeCell litigation as well as a petition for *inter partes* review[5] challenging yet another related patent, U.S. Patent No. 9,125,971 ("the '971 patent"). *See id.* Patent Owner explains that Livesey and Werner were the basis for rejections during prosecution of the '420 and '986 patents. *Id.* Regarding Walker, Patent Owner asserts that the IPR petition challenging the '971 patent cited Walker as a reference, and that "[d]uring prosecution of the '420 and '986 patents, LifeNet submitted a copy of the '971 IPR petition and the Examiner acknowledged consideration." *Id.* at 10.

After considering Patent Owner's arguments, we are not persuaded that we should exercise our discretion under § 314(a) to deny the Petition. The most significant factor in that analysis is the absence of a sufficient showing that the Office or the courts have already considered the patentability of the subject matter claimed in the '200 patent in view of Walker. Patent Owner does not assert that Walker was considered as part of the LifeCell litigation, and we see no indication that it was from the judicial rulings that the parties have provided to us. *See* Ex. 2001, 28–37 (denying judgment as a matter of law and discussing anticipation theories based on Werner and Duran as well as obviousness theories based on Werner, Duran, Goldstein, and Livesey). With respect to proceedings at the Office, the arguments and evidence of record present no indication that the Examiner ever issued a rejection based on Walker or otherwise substantively addressed

[5] The IPR petition challenging the '971 patent is in the record as Exhibit 2006 and was later assigned the following case number: Case IPR2015-01888. In that IPR, the Board instituted trial and then terminated the proceeding when Patent Owner requested adverse judgment. *See* Ex. 1036 (institution decision); Ex. 1037 (termination order).

Walker during prosecution of the ’200 patent or the related ’420 or ’986 patents. Moreover, Patent Owner does not allege that Walker is cumulative of Livesey, Werner, or any other references evaluated during proceedings at the Office or the courts.

The link that Patent Owner draws between Walker and the ’200 patent is that Walker was cited in an IPR petition challenging the ’971 patent, and that petition was submitted to the Examiner during prosecution of the ’420 and ’986 patents. In the circumstances of this case, that link is simply too attenuated to support an inference that the Office has already given adequate consideration to Walker in a patentability determination regarding the subject matter claimed in the ’200 patent. The lists of “References Cited” in the ’420 and ’986 patents span many pages and reflect the voluminous materials that were submitted to the Examiner during prosecution of those patents, including lengthy transcripts and judicial opinions from the LifeCell litigation as well as an extensive collection of patents and scientific literature. *See* Ex. 1002, 1–7; Ex. 1003, 1–6. Against this backdrop, and considering that the Examiner did not reject the claims based on Walker or otherwise discuss Walker in the prosecution histories of any of the ’200, ’420, or ’986 patents, we are not persuaded that Petitioner’s challenges based on Walker have already been given due consideration with respect to the challenged claims of the ’200 patent.

Petitioner’s challenges rely heavily on Walker, including Grounds 1 and 2 based solely on Walker, and Ground 5 in which Walker is a primary reference. As a result of the Supreme Court’s decision in *SAS Institute Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018) and the Office’s guidance implementing *SAS*, a decision to institute is “a simple yes-or-no institution

choice respecting a petition, embracing all challenges included in the petition." *PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1360 (Fed. Cir. 2018). Here, where we have determined that Petitioner's Walker-based challenges to the '200 patent have not been considered previously, the Petition's reliance on additional references (namely, Werner and Livesey) that were previously considered by the courts and the Office is not reason enough to deny institution of the entire Petition.

Leaving aside the Walker-based challenges and looking only at Petitioner's challenges based on Livesey and Werner, we note that Petitioner was not a party to any of the earlier proceedings, and Petitioner's use of Livesey and Werner in its Petition differs somewhat from the invalidity theories presented in the LifeCell litigation. In particular, Patent Owner explains that in the LifeCell litigation, "LifeCell did not even attempt to argue that Livesey taught a plasticized soft tissue graft, and instead relied upon Livesey only for its teaching of cleaning." Sur-Reply 4. Here, Petitioner does argue that Livesey teaches a plasticized soft tissue graft, along with every other limitation of claim 1. *See* Pet. 43–50. In other words, whereas Livesey served only as a secondary reference to supplement Werner in the LifeCell litigation, Petitioner's challenges rely on Livesey as a primary reference. Thus, the invalidity theories involving Livesey and Werner that the defendant chose to pursue in the LifeCell litigation differed from the theories of unpatentability presented in the Petition.

For these reasons, we do not exercise discretion under § 314(a) to deny institution.

III. LEVEL OF ORDINARY SKILL IN THE ART

The parties provide very similar proposals for the level of ordinary skill in the art. *Compare* Pet. 10–11, *with* Prelim. Resp. 11. Consistent with those proposals, and based on our review of the record at this preliminary stage, we find that the level of ordinary skill in the art is (1) a master's degree in biology, chemistry, physiology, biochemistry, biomaterials engineering, biomedical engineering, or a related field, and approximately three years of research or work experience related to preparing and/or processing tissue for transplantation into humans, or (2) a bachelor's degree in biology, chemistry, physiology, biochemistry, biomaterials engineering, biomedical engineering, or a related field, and approximately five years of research or work experience related to preparing and/or processing tissue for transplantation into humans.

IV. CLAIM CONSTRUCTION

"In an *inter partes* review proceeding, a claim of a patent . . . shall be construed using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b)." *See* Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (codified at 37 C.F.R. § 42.100(b) (2019)) (amending 37 C.F.R. § 42.100(b) effective November 13, 2018).[6] That standard "includ[es] construing the claim in accordance with the ordinary and

[6] The Petition in this case was filed January 29, 2019. *See* Paper 3, 1. Moreover, Patent Owner points out that regardless of the rule change, the *Phillips* standard would apply in this proceeding because the '200 patent is expired. *See* Prelim. Resp. 12 n.4.

customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent." *Id.*; *see also Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc); Prelim. Resp. 12 (noting that the *Phillips* claim construction standard governs).

We discuss two terms below. No other claim term requires express construction to reach a decision on institution. *See Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (claim terms need only be construed "to the extent necessary to resolve the controversy"); *see also Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (applying *Vivid Techs.* in the context of an *inter partes* review).

A. "plasticized soft tissue graft"

The parties agree that the term "plasticized soft tissue graft" should be construed as follows:

> a load-bearing and/or non-load-bearing soft tissue product, including skin, pericardium, dura mater, fascia lata, and a variety of ligaments and tendons composed of an internal matrix where free and loosely bound waters of hydration in the tissue have been replaced with one or more plasticizers without altering the orientation of the collagen fibers, such that the mechanical properties, including the material, physical and use properties, of the tissue product are similar to those of normal hydrated tissue.

See Pet. 16–17; Prelim. Resp. 15. That is the construction adopted by the district court in the LifeCell litigation, which the Federal Circuit reviewed and upheld on appeal. *See* Ex. 1019, 7–8; Ex. 2002, 10–11. The parties' agreed construction also appears to be consistent with the evidence of record. *See, e.g.*, Ex. 1001, 7:24–28, 8:3–12, 9:14–18. Accordingly, we accept the parties' agreed construction of the term "plasticized soft tissue graft."

B. "cleaned"

The parties agree that, in the LifeCell litigation, the district court construed the term "cleaned" as "a process during which cellular elements and small molecular weight solutes are removed." Pet. 16; Prelim. Resp. 14. The parties dispute whether that construction encompasses partial removal of cellular elements and small molecular weight solutes. Pet. 16 ("A POSITA would have understood that the cleaning process . . . only partially removes cellular elements from the soft tissue."); Prelim. Resp. 14 ("Petitioner's attempt to read in additional limitations from the examples in the specification is improper and should be rejected.").

The parties' briefing on this issue is limited. Petitioner does not explain what specific modification, if any, it is proposing to the construction adopted by the district court in the LifeCell litigation. *See* Pet. 16. Meanwhile, Patent Owner's discussion does not cite any portion of the '200 patent or its prosecution history to support Patent Owner's apparent position that cleaning must remove all cellular elements and small molecular weight solutes. *See* Prelim. Resp. 14–15. Additionally, Patent Owner's criticism that Petitioner is improperly importing limitations from the specification appears inapt because Petitioner is arguing for a broader understanding of the claim term, not a narrower one.

The plain language of the district court construction quoted by the parties appears to encompass partial removal of cellular elements and small molecular weight solutes. Additionally, the specification of the '200 patent discloses that tissue that has been "cleaned" can still be "further cleaned," suggesting that "cleaned" tissue retains at least some elements that can be "further cleaned" if desired. *See* Ex. 1001, 9:57–65 ("The *cleaned* bone *can*

then be further cleaned" to "dislodge[e] residual bone marrow materials . . . ." (emphasis added)).

At this stage of the proceeding, we agree with Petitioner that the term "cleaned" as it appears in the phrase "cleaned soft tissue graft" (claim 1) encompasses soft tissue grafts in which some, but not necessarily all, cellular elements and small molecular weight solutes have been removed. We encourage the parties to develop this issue further if they believe it would be helpful to the resolution of the issues presented in this case.

V. ANALYSIS OF PROPOSED GROUNDS

A. Legal Standards

1. Anticipation

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros., Inc., v. Union Oil Co.*, 814 F.2d 628, 631 (Fed. Cir. 1987). Moreover, "[b]ecause the hallmark of anticipation is prior invention, the prior art reference — in order to anticipate under 35 U.S.C. § 102 — must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements 'arranged as in the claim.'" *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008). Whether a reference anticipates is assessed from the perspective of an ordinarily skilled artisan. *See Dayco Prods., Inc. v. Total Containment, Inc.*, 329 F.3d 1358, 1368 (Fed. Cir. 2003) ("[T]he dispositive question regarding anticipation [i]s whether *one skilled in the art* would

reasonably understand or infer from the [prior art reference's] teaching that every claim element was disclosed in that single reference.").

2. Obviousness

In *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 (1966), the Supreme Court set out a framework for assessing obviousness under § 103 that requires consideration of four factors: (1) the "level of ordinary skill in the pertinent art," (2) the "scope and content of the prior art," (3) the "differences between the prior art and the claims at issue," and (4) "secondary considerations" of non-obviousness such as "commercial success, long-felt but unsolved needs, failure of others, etc." *Id.* at 17–18. "While the sequence of these questions might be reordered in any particular case," *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 407 (2007), the Federal Circuit has "repeatedly emphasized that an obviousness inquiry requires examination of all four *Graham* factors and that an obviousness determination can be made only after consideration of each factor." *Nike, Inc. v. Adidas AG*, 812 F.3d 1326, 1335 (Fed. Cir. 2016).

At this stage of the proceeding, neither party has presented evidence or argument directed to secondary considerations. The first *Graham* factor was discussed above in Section III. Our discussion below addresses the remaining *Graham* factors.

B. Ground 1: Anticipation by Walker

Petitioner contends that claims 1–3, 5, 7–10, 12, and 15 are anticipated by Walker. Pet. 24–39. Patent Owner disputes these contentions. Prelim. Resp. 16–21. After considering the arguments and evidence currently of record, we determine that Petitioner has established a reasonable likelihood of prevailing in this ground.

1. Summary of Walker

Walker discloses "[a] method of sterilising material . . . for implantation into a human or animal body" in which the material is treated with "a substance . . . selected so as to maintain certain physical characteristics of the material such as flexibility and/or structure of cells or extra cellular material." Ex. 1005, 1 (abstract).[7] "Suitable substances include . . . glycerol." *Id.* Walker teaches that its method "can be used on gra[ft]s for implantation or on biological material such as vascular tissue etc. and has the advantage that the substance does not react with water and so the material can be treated in solution without drying out or becoming brittle." *Id.*

Walker's method includes, *inter alia*, storing the material in an ethanol solution, treating with glycerol, and treating with ethylene oxide to sterilize. *E.g.*, *id.* at 4:2–3, 5:17–20. Walker discloses that the "pre-sterilising treatment," which may include treatment with glycerol, "enables the material substantially to retain certain physical characteristics, such as flexibility, and can suitably replace at least some of the water contained in the material." *Id.* at 6:20–24.

2. Analysis

a. Claim 1

The preamble of claim 1 recites "[a] plasticized soft tissue graft suitable for transplantation into a human." Petitioner argues that Walker's disclosure of incubating tissue in glycerol would yield "a plasticized soft tissue graft." Pet. 24–26, 28 (citing Ex. 1005, 2:14–21, 3:23–24, 4:17–18,

[7] In our pin cites to Walker, page numbers refer to the stamp added by Petitioner to the lower right corner of each page of Walker.

15:16–18). Petitioner points to Walker's disclosure that the plasticized material retains the physical characteristics of the untreated material, such as flexibility. *Id.* at 25 (citing Ex. 1005, 4:20–22). Petitioner further argues that the results reported in Walker for suture pull-out experiments and maximum loading tests show that the plasticized tissue maintains its structural and mechanical properties. *Id.* at 25–26 (citing Ex. 1005, 7:31–9:31). Patent Owner disputes Petitioner's assertions. *See* Prelim. Resp. 16–21. Indeed, in its Preliminary Response, the requirement[8] of a "plasticized soft tissue graft" is the only aspect of claim 1 that Patent Owner relies on to distinguish Walker. *See id*. As explained below, we do not find Patent Owner's argument to be persuasive based on the current record. For purposes of institution, Petitioner has adequately shown that Walker discloses "a plasticized soft tissue graft."

Before discussing the "plasticized soft tissue graft" term in greater detail, we will briefly review Petitioner's contentions regarding the other limitations of claim 1, which are presently undisputed. Claim 1 recites "a cleaned soft tissue graft having an internal matrix." Petitioner argues that Walker's treatment with ethanol would at least partially remove cellular elements from Walker's tissue. Pet. 25, 29 (citing Ex. 1005, 7:19–20, 15:3–5; Ex. 1034 ¶¶ 84, 98). In view of the construction of "cleaned" we adopted

[8] Neither party takes a firm position on whether the preamble in claim 1 is limiting. *See* Pet. 25 ("To the extent the preamble is limiting, Walker discloses . . . ."); Prelim. Resp. 16–21 (contesting Petitioner's arguments without addressing whether preamble is limiting). Because the disputed "plasticized soft tissue graft" phrase appears in the body of claim 1 as well as the preamble, we need not determine whether the preamble is limiting for purposes of this Decision. *See* Ex. 1001, 24:10, 24:15.

in Section IV.B., Petitioner has sufficiently shown that Walker discloses this limitation.

Next, claim 1 recites "one or more plasticizers contained in said internal matrix." Petitioner argues that the internal matrix of Walker's tissue would contain the plasticizer glycerol in view of Walker's disclosure of treating tissue with glycerol for sixteen hours or more, as well as Walker's teaching that glycerol keeps the dimensions stable during processing. *See* Pet. 26–27, 29. For purposes of institution, Petitioner has adequately shown that Walker discloses this limitation.

Finally, claim 1 recites "said one or more plasticizers are not removed from said internal matrix of said plasticized soft tissue graft prior to transplantation into a human." Petitioner argues that glycerol is incorporated into the internal matrix of Walker's tissue, and that the glycerol would not be removed with the brief washing that Walker teaches to carry out. Pet. 27, 30 (citing Ex. 1005, 4:29–31; Ex. 1034 ¶ 100). Patent Owner does not address this limitation separate from its argument that Walker does not teach a plasticized soft tissue graft, which we discuss below. For purposes of institution, Petitioner has adequately shown that Walker discloses this limitation.

Returning to the "plasticized soft tissue graft" term, Patent Owner argues that Walker's glycerol does not replace the free and loosely bound waters of hydration in the tissue in the manner required by the construction we have adopted in Section IV.A. *See* Prelim. Resp. 17–21. Given the similarity of the processes described in the '200 patent and Walker, as well as the absence in the current record of expert testimony supporting Patent Owner's arguments, we do not find Patent Owner's arguments persuasive.

The ’200 patent discloses “[i]ncubating” tissue in a plasticizer composition, which the patent defines to include “soaking the graft in the composition.” Ex. 1001, 6:46–49. Incubation can also include shaking or mild agitation. *Id.* at 6:49, 18:54–55. The ’200 patent teaches that plasticizers, including glycerol, “can easily displace/replace water at the molecular level.” *Id.* at 7:30–32. These descriptions in the ’200 patent indicate that replacement of water in the tissue with glycerol is the natural result of soaking tissue in a glycerol composition. And Walker teaches an incubation method that appears to be the same in relevant respects. Walker teaches to incubate the tissue, preferably with agitation, in a glycerol composition. Ex. 1005, 5:17–24, 7:7–13. Walker explicitly teaches that its methods result in “plasticized” tissues. *E.g.*, *id.* at 9:22–23. At this stage of the proceeding, Patent Owner has not persuasively explained why Walker’s process would not yield the same results as disclosed by the ’200 patent — namely, a plasticized soft tissue graft that has mechanical properties approximating those of natural soft tissue. *See Eli Lilly & Co. v. Barr Labs., Inc.*, 251 F.3d 955, 970 (Fed. Cir. 2001) (“A reference includes an inherent characteristic if that characteristic is the ‘natural result’ flowing from the reference’s explicitly explicated limitations.” (quoting *Continental Can Co. USA v. Monsanto Co.*, 948 F.2d 1264, 1290 (Fed. Cir. 1991))).

Patent Owner emphasizes that Walker discusses rehydration of its tissue grafts. *See* Prelim. Resp. 17–24. Yet this still does not explain why subjecting the same materials to the same process would yield a different result in Walker, particularly given that Walker expressly describes its tissues as plasticized. Patent Owner does not persuasively identify a difference between its materials or incubation process and those of Walker

that would cause differences in the resulting soft tissue graft, or that would make rehydration essential in Walker but unnecessary using the invention claimed in the '200 patent. Further, Patent Owner does not connect its arguments concerning rehydration to the language of claim 1. In particular, claim 1 does not appear to prohibit rehydration. Thus, the relevance of Patent Owner's arguments focusing on the alleged need in Walker to rehydrate the tissue is unclear.

Accordingly, we determine that Petitioner's arguments and evidence establish a reasonable likelihood that Petitioner will prevail with respect to claim 1.

b. Claims 2, 3, 5, 7–10, 12, and 15

Petitioner provides a detailed explanation of its challenge to claims 2, 3, 5, 7–10, 12, and 15. Pet. 30–39. At this stage of the proceeding, Patent Owner has not presented arguments concerning these claims separate from its arguments regarding the "plasticized soft tissue graft" term, which we discussed above in connection with claim 1. *See* Prelim. Resp. 16–21. After reviewing Petitioner's arguments and evidence, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing in its challenge to those claims.

C. Ground 2: Obviousness over Walker

Petitioner asserts that claims 1–3, 5–10, 12, 13, and 15 would have been obvious in view of Walker. Pet. 39–43. As to claims 1–3, 5, 7–10, 12, and 15, Petitioner refers back to its arguments that Walker anticipates these claims and argues obviousness in the alternative to its anticipation theory. *See id.* at 39. Specifically, Petitioner contends that if Walker is found not to disclose that "the plasticizers are not removed from the internal matrix" as

required by these claims, the claimed subject matter would have been obvious because an ordinarily skilled artisan would have known that permitting glycerol to remain in the internal matrix would preserve the tissue and would not degrade it, whereas removing the glycerol would require extensive washing and would leave the tissue susceptible to degradation. *See id.* at 40–41 (citing Ex. 1034 ¶¶ 127–134). As to claims 6 and 13, Petitioner provides an explanation of why the additional subject matter recited in these dependent claims would have been obvious to an ordinarily skilled artisan in view of Walker's teachings. *See id.* at 41–43. Patent Owner's arguments against this obviousness ground essentially repeat the arguments Patent Owner presents against the anticipation ground. *See* Prelim. Resp. 21–23. On the record before us, we determine that Petitioner's arguments and evidence establish a reasonable likelihood that Petitioner will prevail with respect to this proposed ground of unpatentability.

D. Ground 3: Anticipation by Livesey

Petitioner asserts that Livesey anticipates claims 1–3, 7, 8, 10, and 15. Pet. 43–59. For reasons set forth below, we determine that Petitioner's arguments and evidence establish a reasonable likelihood that Petitioner will prevail with respect to this proposed ground of unpatentability.

1. Summary of Livesey

Livesey discloses methods for processing and preserving tissue matrices for transplantation in which tissues are treated "with a processing solution to remove cells" and then treated with a cryoprotectant solution before freezing, drying, storage, and rehydration. Ex. 1004 at [57] (abstract). Glycerol is among the cryoprotectants that Livesey discloses. *Id.*

at 11:49–51. Livesey discloses that its methods allow biological samples to be cooled and stored "without causing structural and functional damage." *Id.* at 14:59–63.

2. Analysis

Petitioner provides a detailed explanation of its challenge to claim 1 as anticipated by Livesey. *See* Pet. 43–50. In general, Petitioner's analysis of Livesey is similar to the anticipation analysis Petitioner presents for Walker. *See id.* We have reviewed Petitioner's arguments and evidence, and we determine that Petitioner has demonstrated a reasonable likelihood of prevailing in its challenge to claim 1. Patent Owner argues that Livesey does not teach a plasticized soft tissue graft with mechanical properties approximating those of natural tissue. Prelim. Resp. 23–27. In particular, Patent Owner focuses on Livesey's disclosures of freeze-drying and rehydration prior to implantation. *See id.*

Patent Owner's arguments do not persuade us that the Petition's analysis fails to meet the threshold for institution of trial. Similar to both Walker and the '200 patent, Livesey discloses "incubat[ing]" soft tissue samples in glycerol, which Livesey describes as a cryoprotectant. *E.g.*, Ex. 1004, 5:27, 11:17–18, 11:49–51, 12:31–33. Livesey describes glycerol as a "cryoprotectant" rather than as a "plasticizer," but glycerol is the same material disclosed by both Walker and the '200 patent as resulting in tissue plasticization when tissue is soaked in the composition. As discussed above in connection with the Walker-based grounds, on the current record, it is unclear how or why subjecting the same materials (e.g., soft tissue) to the same composition (glycerol) as part of the same process (i.e., incubation/soaking) would not result the same product—namely, a tissue in

which glycerol replaces the free and loosely bound waters of hydration to produce a plasticized soft tissue graft with mechanical properties approximating those of natural tissue. Dr. McQuillan states that it would. *See, e.g.*, Ex. 1034 ¶¶ 62, 65–81.[9] At this stage, Patent Owner has not yet filed an expert declaration in this proceeding to rebut Dr. McQuillan's testimony.

The fact that Livesey describes freeze-drying and rehydration prior to implantation does not persuade us that Livesey's tissue falls beyond the scope of claim 1. *See* Prelim. Resp. 24–27. Patent Owner does not point to, and we do not find, any language in claim 1 prohibiting freeze-drying or rehydration.

On the current record, we determine that Petitioner's arguments and evidence establish a reasonable likelihood that Petitioner will prevail with respect to claim 1.

Petitioner provides a detailed explanation of its challenge to claims 2, 3, 7, 8, 10, and 15. Pet. 50–59. At this stage of the proceeding, Patent Owner has not raised distinct arguments concerning those claims. *See* Prelim. Resp. 23–27. We have reviewed Petitioner's arguments and evidence, and we determine that Petitioner has demonstrated a reasonable likelihood of prevailing in its challenge to those claims as well.

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[9] We are aware of Patent Owner's assertion that the patentee of the Livesey reference argued during prosecution of a related application that Livesey "describes drying of acellular tissue matrices, not water replacement." Prelim. Resp. 25 n.9. Although we find that to be noteworthy, at least at this stage of the proceeding, we do not discern sufficient differences between Livesey's incubation-in-glycerol process and that of Walker and the '200 patent that would explain how or why the glycerol in Livesey fails to replace water molecules in tissue when tissue is incubated in glycerol.

E. Ground 4: Obviousness over Livesey

Petitioner asserts that claims 1–3, 7, 8, 10, and 15 would have been obvious in view of Livesey. Pet. 59–61. Petitioner refers back to its arguments that Livesey anticipates these claims and argues obviousness in the alternative to its anticipation theory. *See id.* at 59–60. In particular, Petitioner contends that if Livesey is found not to disclose that "the plasticizers are not removed from the internal matrix" as required by these claims, the claimed subject matter would have been obvious because an ordinarily skilled artisan would have known that permitting glycerol to remain in the internal matrix would preserve the tissue and would not degrade it, whereas removing the glycerol would require extensive washing and would leave the tissue susceptible to degradation. *See id.* at 60–61. Patent Owner's arguments against this ground are the same as those discussed above in connection with the Livesey anticipation ground. *See* Prelim. Resp. 27–28. On the record before us, we determine that Petitioner's arguments and evidence establish a reasonable likelihood that Petitioner will prevail with respect to this proposed ground of unpatentability.

F. Ground 5: Obviousness over Walker or Livesey in View of Werner

Petitioner asserts that claim 4 would have been obvious in view of Walker or Livesey in view of Werner. Pet. 61–63. Claim 4 depends from "any one of claims 1, 2, [or] 3" and adds that "said soft tissue graft is suitable for direct transplant into a human without rehydration." For the reasons set forth below, we determine that Petitioner's arguments and

evidence establish a reasonable likelihood that Petitioner will prevail with respect to this proposed ground of unpatentability.

1. Summary of Werner

Werner discloses methods of manufacturing "sclera protein transplants." Ex. 1006 at [57] (abstract). In particular, Werner discloses a method in which tissue such as "raw dura matter from humans" is treated with H_2O_2, degreased, rinsed, treated with a glycerin[10] solution, and then dried. *Id.* at 2:21–29. Werner discloses that the "glycerin impregnates the transplant by a diffusion process." *Id.* at 2:5–6. Werner discloses that its "product is soft and no rehydration is necessary prior to its use." *Id.* at 2:39–40.

2. Analysis

Petitioner relies on Walker and Livesey largely as set forth in the anticipation grounds discussed above and further argues that, if neither Walker nor Livesey discloses implantation without rehydration, Werner teaches a similar tissue product treated with glycerol that does not require rehydration before implantation. *Id.* at 62. Petitioner argues that, due to the similarities of Walker, Livesey, and Werner, a person of ordinary skill in the art would have recognized in view of Werner "that no rehydration of the tissue product [of Walker or Livesey] is necessary before implantation, and would have had a reasonable expectation of success in that adaptation." *Id.* Petitioner argues that such a modification would "simplify the processing of the soft tissue graft during implantation" and "would achieve the known advantage of allowing for direct implantation of the plasticized soft tissue

[10] The words "glycerin" and "glycerol" refer to the same compound. *E.g.*, Ex. 1034 ¶ 37; Ex. 1001 at 5:25 (referring to "glycerol (glycerin USP)").

graft instead of requiring rehydration before implantation." *Id.* at 62–63. At least at this stage of the proceeding, we find Petitioner's arguments to be persuasive and consistent with the record.

Patent Owner argues that neither Walker nor Livesey teach a "plasticized soft tissue graft," and that both Walker and Livesey teach needing to rehydrate the grafts. Prelim. Resp. 28–29. Patent Owner also argues that "Werner does not remedy the deficient teaching of Livesey or Walker," and that "Werner makes clear that the mechanical properties of the tissue are intentionally affected—such that they do not approximate the mechanical properties of natural soft tissue." *Id.* at 29.

Patent Owner's arguments do not persuade us that the Petition's analysis fails to meet the threshold for institution of trial. Patent Owner's argument that Walker and Livesey teach to rehydrate the tissue after soaking in glycerol essentially argues those references in isolation. *See In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986) ("Non-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references. . . ."). Petitioner's obviousness theory in this ground relies additionally on Werner and contends that in view of Werner's teachings, a person of ordinary skill in the art would have reconsidered whether rehydration is necessary in Walker or Livesey. Additionally, as set forth above, given the similarities of the processes of both Walker and Livesey to the process disclosed by the '200 patent, we also question why the grafts of Walker and Livesey would require rehydration but the graft of the '200 patent would not. *See Southwire Co. v. Cerro Wire LLC*, 870 F.3d 1306, 1311–12 (Fed. Cir. 2017) (affirming Board's determination of obviousness based on a reference that taught the

same process as claimed but did not expressly disclose a limitation reciting the resulting reduction in pulling force because "there is no indication that the limitation is anything other than mere quantification of the results of a known process").

As to Patent Owner's argument concerning the mechanical properties of Werner's tissue, Patent Owner acknowledges that Werner's results involved "hard cerebral meninges" tissue. Prelim. Resp. 29. Patent Owner does not allege that a person of ordinary skill in the art would have expected the same results in the different types of tissue disclosed by Livesey and Walker. *Id.* On the record before us, we determine that Petitioner's arguments and evidence establish a reasonable likelihood that Petitioner will prevail with respect to this proposed ground of unpatentability.

G. Conclusion

We determine that Petitioner has demonstrated a reasonable likelihood of prevailing in showing the unpatentability of at least one claim of the '200 patent. At this preliminary stage of the proceeding, we have not made a final determination with respect to the resolution of any factual or legal issue.

VI. ORDER

It is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), *inter partes* review of claims 1–10, 12, 13, and 15 of the '200 patent is instituted with respect to all grounds set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(a) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial, which commences on the entry date of this Decision.

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