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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TISSUE TRANSPLANT TECHNOLOGY LTD. &
HUMAN BIOLOGICS OF TEXAS, LTD.,
Petitioner,

v.

MIMEDX GROUP, INC.,
Patent Owner.

Case IPR2015-00420
Patent 8,597,687 B2

Before LORA M. GREEN, SUSAN L. C. MITCHELL, and JACQUELINE T. HARLOW, *Administrative Patent Judges*.

GREEN, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

Tissue Transplant Technology Ltd. (d/b/a Bone Bank Allografts) and Human Biologics of Texas, Ltd. (collectively, "Petitioner") filed a Petition requesting an *inter partes* review of claims 1–7 of U.S. Patent No. 8,597,687 B2 (Ex. 1001, "the '687 patent"). Paper 3 ("Pet."). MiMedx Group, Inc. ("Patent Owner") filed a Preliminary Response to the Petition. Paper 9 ("Prelim. Resp."). We determined that the information presented in the Petition and the Preliminary Response demonstrated that there was a reasonable likelihood that Petitioner would prevail in challenging claims 1–7 as unpatentable under 35 U.S.C. § 103(a). Pursuant to 35 U.S.C. § 314, the Board instituted trial on July 10, 2015, as to the challenged claims of the '687 patent. Paper 11 ("Institution Decision" or "Dec. Inst.").

Patent Owner filed a Response (Paper 19, "PO Resp."), but did not file a motion to amend. Petitioner subsequently filed a Reply. Paper 21 ("Reply"). Neither party requested oral hearing. *See* Paper 24 (noting that Petitioner did not request oral hearing, and granting Patent Owner's request to withdraw its request for oral hearing).

We have jurisdiction under 35 U.S.C. § 6(c). This final written decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. Based on the record before us, we conclude that Petitioner has demonstrated by a preponderance of the evidence that claims 1–7 of the '687 patent are unpatentable.

A. Related Proceedings

Petitioner states that the '687 patent is the subject of the copending district court case, *MiMedx Group, Inc. v. Tissue Transplant Technology Ltd.*, Case No. 1:14-CV-719-HLH (W. D. Tex.). Pet. 2; Paper 14, 1.

In addition Petitioner filed another petition for *inter partes* review against Patent Owner in IPR2015-00320 (U.S. Patent No. 8,709,494 B2), in which we declined to institute trial. IPR2015-00320, Paper 13.

B. The '687 Patent (Ex. 1001)

The '687 patent issued on December 3, 2013, with John Daniel listed as the sole inventor. Ex. 1001. The '687 patent relates to tissue allografts, and more particularly "to placental membrane tissue grafts (amnion and chorion) and methods of preparing, preserving, and medical uses for the same." *Id.* at 1:19–21.

As taught by the '687 patent:

> The placenta has two primary layers of tissue including amniotic membrane and chorion. The amniotic membrane is a non-vascular tissue that is the innermost layer of the placenta, and consists of a single layer, which is attached to a basement membrane. Histological evaluation indicates that the membrane layers of the amniotic membrane consist of epithelium cells, thin reticular fibers (basement membrane), a thick compact layer, and fibroblast layer. The fibrous layer of amnion (i.e., the basement membrane) contains cell anchoring collagen types IV, V, and VII. The chorion is also considered as part of the fetal membrane; however, the amniotic layer and chorion layer are separate and separable entities.

Id. at 1:35–48.

Placental membrane has been used for various types of reconstructive surgery since the early 1900s, and has also been widely used in ophthalmic procedures. *Id.* at 1:25–31. The '687 patent teaches:

> There is an additional need for a drying fixture that includes grooves or raised edges that define the outer contours of each desired tissue graft and that make cutting of the grafts more accurate and easy. There is a further need for a drying fixture that includes raised or indented logos, textures, designs, or text that emboss the middle area of the tissue grafts during

> dehydration and that enables an end user to be [able] to distinguish the top surface from the bottom surface of the graft, which is often necessary to know prior to using such grafts in a medical application or surgical procedure. Such logos, textures, designs, or text can be used for informational purposes or they can, additionally and advantageously, be used for marketing or advertising purposes.

Id. at 2:24–36.

According to the ’687 patent, after preparation of the tissue graft, it is dehydrated on a drying fixture. *Id.* at 7:47–51. The drying fixture may have grooves, which may be arranged in a grid, and may also have a design in the empty spaces of the grid, such as a logo or name. *Id.* at 8:13–31. According to the ’687 patent, “[p]referably, such texture/label can be read or viewed on the tissue in only one orientation so that, after drying and cutting, an end user (typically a surgeon) of the dried tissue will be able to tell the stromal side from the basement side of the dried tissue.” *Id.* at 8:25–29. Once the tissue is dehydrated, it can be cut into specific product sizes, and each cut allograft is placed into its own pouch. *Id.* at 9:7–15.

C. Illustrative Claim

Petitioner challenges claims 1–7 of the ’687 patent. Claim 1 is the only independent claim, is illustrative, and is reproduced below:

> 1. A method for permitting direct, visual determination of the orientation of a placental tissue graft by user, wherein the placental tissue graft has a first side and a second side, said method comprising: placing an asymmetric label on a portion of at least one side of said tissue graft, which label visibly distinguishes one side from the other side, thereby permitting direct, visual determination of the orientation for application of said tissue graft; and ascertaining the orientation of the placental tissue graft by direct visual determination.

Ex. 1001, 11:14–12:4.

D. Instituted Challenges

We instituted trial based on the following grounds of unpatentability (Dec. Inst. 18):

References	Basis	Claims Challenged
Nigam[1] and Hariri[2]	§ 103(a)	1–7
Dua[3] and Hariri	§ 103(a)	1–7

Petitioner relies on the Declaration of Daniel L. Mooradian, Ph.D. Ex. 1002. Patent Owner relies on the Declaration of Roy Chuck, M.D., Ph.D. Ex. 2023.

II. ANALYSIS

A. Claim Construction

In an *inter partes* review, claim terms in an unexpired patent are interpreted according to their broadest reasonable construction in light of the Specification of the patent in which they appear. *See* 37 C.F.R. §42.100(b); *Cuozzo Speed Techs., LLC v. Lee*, No. 15–446, 2016 WL 3369425, at *12 (U.S. June 20, 2016) (upholding the use of the broadest reasonable interpretation standard). Under the broadest reasonable construction standard, claim terms are presumed to have their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the

[1] Nigam, US 6,581,993 B2, issued Jun. 24, 2003 (Ex. 1013).

[2] Hariri et al. ("Hariri"), Pub. No. US 2004/0048796 A1, published Mar. 11, 2004 (Ex. 1015).

[3] Harminder S. Dua and Augusto Azuara-Blanco ("Dua"), *Amniotic Membrane Transplantation*, 83 BR. J. OPTHALMOL. 748–752 (1999) (Ex. 1014).

context of the entire disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

"[T]he specification 'is always highly relevant to the claim construction analysis. Usually it is dispositive; it is the single best guide to the meaning of a disputed term.'" *In re Abbott Diabetes Care Inc.*, 696 F.3d 1142, 1149 (Fed. Cir. 2012) (quoting *Phillips v. AWH Corp.*, 415 F.3d 1303, 1315 (Fed.Cir.2005) (en banc)). The Court of Appeals for the Federal Circuit has cautioned, however, "[t]here is a fine line between construing the claims in light of the specification and improperly importing a limitation from the specification into the claims." *Retractable Techs., Inc. v. Becton, Dickinson, and Co.*, 653 F.3d 1296, 1305 (Fed. Cir. 2011). Thus, "[e]ven when the specification describes only a single embodiment, the claims of the patent will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using 'words or expressions of manifest exclusion or restriction.'" *Hill-Rom Services, Inc. v. Stryker Corp.*, 755 F.3d 1367, 1372 (Fed. Cir. 2014).

i. "asymmetric label"

Petitioner contends that "asymmetric" should be construed as "lacking any mirror image symmetry," and "label" should be construed as "an identifying mark." Pet. 9. Patent Owner contends that "asymmetric label" should be construed as "an identifier or marking of some kind that lacks some form of symmetry based on its design or its positioning on, and shape of, the tissue graft." PO Resp. 10. In particular, Patent Owner notes that "there is nothing in the specification that supports a requirement that the label lack 'any mirror image symmetry.'" *Id.* at 11 (citing Ex. 1001, 8:7–29; Ex. 2012, 170:6–191:9). Thus, according to Patent Owner, the "asymmetry

of the label must simply permit a user to distinguish one side of the graft from the other." *Id.* (citing Ex. 2023 ¶¶ 22, 85–86); *see also* PO Resp., 12 (noting that the "significance of the asymmetry is that the label differentiates the top and bottom sides of the tissue graft based on some form of asymmetry.").

Consistent with the construction adopted in the Decision on Institution (Dec. Inst. 5), we agree with Patent Owner that the broadest reasonable interpretation of "asymmetric label," when read in context of the Specification of the '687 patent, is "an identifier or marking of some kind that lacks some form of symmetry based on its design or its positioning on, and shape of, the tissue graft, allowing for distinguishing one side of the graft from the other." *See* Ex. 1001, 8:15–38, Fig. 5.

ii. "placing an asymmetric label on a portion"

Petitioner contends that "placing an asymmetric label on a portion" should be construed as "placing an[ ] identifying mark which lacks any mirror image symmetry on a middle portion." Pet. 9. Patent Owner argues that "placing an asymmetric label on a portion" should be construed as "placing an identifier or marking of some kind that lacks some form of symmetry based on its design or its positioning on, and shape of, the tissue graft on a portion." PO Resp. 13.

Consistent with the construction adopted in the Decision on Institution (Dec. Inst. 6), we agree with Patent Owner that, when read in the context of the Specification of the '687 patent, the broadest reasonable interpretation of "placing an asymmetric label on a portion" is "placing an identifier or marking of some kind that lacks some form of symmetry based on its design

or its positioning on, and shape of, the tissue graft on a portion." *See* Ex. 1001, 8:15–38, Fig. 5.

iii. "which label visibly distinguishes one side from the other side, thereby permitting direct, visual determination of the orientation"

Neither Petitioner not Patent Owner offers an express construction of this term. Patent Owner, in its arguments as to the challenges of the claims, apparently construes "visibly" as being visible to the naked eye, that is, being "of sufficient size to be visibly distinguishable so as to permit a direct, visual determination," without the use of equipment, such as a microscope. PO Resp. 35. Specifically, according to Patent Owner, "[a]s touted throughout the specification, one of the fundamental hallmarks of the '687 Patent was the ability to quickly distinguish the top and bottom sides of the tissue graft, *without the aid of assistive visual mechanisms* (*e.g.*, a microscope)." *Id.* at 41 (citing Ex. 1001, 1:49–64, 10:13–33; Ex. 2023, ¶ 171).

Petitioner responds that the Specification of the '687 patent "***never*** mentions the phrase 'without the aid of assistive visual mechanisms' or 'naked eye;'" nor is the term microscope ever used. Reply. 14. According to Petitioner, "the specification is silent on the issue of whether the label of the invention is visible by the naked eye or with visual aid." *Id.* Petitioner asserts further that Patent owner's declarant, Dr. Chuck, "acknowledged the term 'microscope' is not utilized in the claims and that there is nothing that mentions the visible limitation must mean without the aid of assistive visual mechanisms." *Id.* at 16 (citing Ex. 1019, 69:10–24, 118:12–19).

Petitioner contends that the Specification in fact suggests that the label may be any size. *Id.* (citing Ex. 1001, 8:1–6). Moreover, Petitioner asserts,

the Specification of the ’687 patent contemplates use of the grafts for advanced ocular defects, and thus, the ordinary artisan would understand the grafts would need to be small, with an equally small label. *Id.* at 16–17 (citing Ex. 1019, 68:18–69:1 (Dr. Chuck acknowledging in deposition that microscopes are used in ocular surgeries)). Finally, Petitioner asserts that Patent Owner’s suggested construction, “taken to its logical extreme,” would create “an unworkable premise that no user may even be able to use glasses or contacts useful for correcting farsightedness or nearsightedness to view a label.” *Id.* at 18.

We agree with Petitioner that “visibly distinguishes” does not require that the label allow one to distinguish the top and bottom sides of the tissue graft without the aid of assistive visual mechanisms. Rather, we construe “visibly distinguishes” as “visibly distinguishing the top and bottom sides of the tissue graft, with or without the aid of assistive visual mechanisms,” as that construction is most consistent with the teachings of the Specification of the ’687 patent.

Patent Owner relies on the following portions of the Specification to support its construction (PO Resp. 41):

> Amniotic membrane and chorion tissue provide unique grafting characteristics when used for surgical procedures, including providing a matrix for cellular migration/proliferation, providing a natural biological barrier, are non-immunogenic, promote increased self-healing, are susceptible of being fixed in place using different techniques including fibrin glue or suturing. And, such grafts, when properly prepared, can be stored at room temperature for extended periods of time, without need for refrigeration or freezing, until needed for a surgical procedure.
>
> Known clinical procedures or applications for such amnion grafts include Schneiderian Membrane repair (i.e. sinus lift), guided tissue regeneration (GTR), general wound care, and

> primary closure membrane. Known clinical procedures or applications for such chorion grafts include biological wou[n]d dressing.
>
> * * * *
>
> Amnion membrane has the following properties and has been shown to be suitable for the following surgical procedures and indications: Guided Tissue Regeneration (GTR), Schneiderian Membrane repair, primary closure, and general wound care.
>
> Laminated amnion membrane has the following properties and has been shown to be suitable for the following surgical procedures and indications: GTR, Reconstructive, General Wound Care, Neurological, ENT.
>
> Chorion tissue grafts have the following properties and have been shown to be suitable for the following surgical procedures and indications: Biological Dressing or Covering.
>
> Laminated chorion tissue grafts have the following properties and have been shown to be suitable for the following surgical procedures and indications: GTR, Reconstructive, General Wound Care, Neurological, ENT.
>
> Laminated amnion and chorion combined tissue grafts have the following properties and have been shown to be suitable for the following surgical procedures and indications: Advanced Ocular Defects, Reconstructive, General Wound Care, Biological Dressing.

Ex. 1001, 1:49–64, 10:13–33.

Those portions of the Specification, however, do not discuss the size of the label, nor does Patent Owner explain how those portions support its construction that the label should be visible without the aid of assistive visual mechanisms. As noted by Petitioner, the Specification teaches (Reply 16):

> In one embodiment, similar to that shown in FIG. **5,** the receiving surface of the drying fixture **500** has grooves **505** that define the product spaces **510,** which are the *desired outer contours of the tissue after it is cut and of a size and shape that is desired for the applicable surgical procedure in which the*

> *tissue will be used*. For example, the drying fixture can be laid out so that the grooves are in a grid arrangement. The grids on a single drying fixture may be the same uniform size or may include multiple sizes that are designed for different surgical applications. *Nevertheless, any size and shape arrangement can be used for the drying fixture, as will be appreciated by those skilled in the art*.

Ex. 1001, 8:1–12 (emphasis added). Moreover, as set forth in the section of the Specification cited by Patent Owner, the Specification of the '687 patent teaches that the grafts are suitable for "Advanced Ocular Defects." *Id.* at 10:29–33.

The part of the Specification that best supports Patent Owner's proposed construction is as follows:

> After cutting, each separate piece or tissue graft is placed in a respective "inner" pouch. The inner pouch, which preferably has a clear side and an opaque side, should be oriented clear side facing up. The tissue graft is placed in the "inner" pouch so that the texture in the form of text, logo, name, or similar design is facing out through the clear side of the inner pouch and is visible outside of the inner pouch. This process is repeated for each separate graft.

Id. at 9:29–36.

That disclosure, however, states nothing about the size of the label, and thus, does not contradict the explicit teaching of the '687 patent that the drying fixture can be any size or shape, and that tissue may be sized for any applicable surgical procedure. *Id.* at 8:1–12. Thus, we determine that the ordinary artisan would understand the disclosure of the '687 patent to teach that the label could be of the appropriate size for the desired application, and not as requiring the label to be visible without the aid of assistive visual mechanisms.

iv. Other Claim Terms

Petitioner (Pet. 8–10) and Patent Owner (7–22) offer constructions for other terms, such as "user" and "ascertaining the orientation." We determine, however, for purposes of this Final Written Decision, none of the remaining terms in the challenged claims requires express construction. *See, e.g. Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (noting that only claim terms that are in controversy need to be construed, and then only to the extent necessary to resolve the controversy).

B. Principles of Law

A claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). The level of ordinary skill in the art usually is evidenced by the references themselves. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995); *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978).

For an obviousness analysis, prior art references must be "considered together with the knowledge of one of ordinary skill in the pertinent art." *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994) (quoting *In re Samour*, 571

F.2d 559, 562 (CCPA 1978)). Moreover, "it is proper to take into account not only specific teachings of the reference, but also the inferences which one skilled in the art would reasonably be expected to draw therefrom." *In re Preda*, 401 F.2d 825, 826 (CCPA 1968). That is because an obviousness analysis "need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *KSR*, 550 U.S. at 418; *see also Translogic*, 504 F.3d. at 1259.

A prior art reference qualifies as prior art under 35 U.S.C. § 103(a) if its subject matter is analogous to the claimed invention. *Innovation Toys LLC v. MGA Entertainment, Inc.*, 637 F.3d 1314, 1321 (Fed. Cir. 2011).

> "A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem." *In re Clay*, 966 F.2d 656, 659 (Fed.Cir.1992). In other words, "familiar items may have obvious uses beyond their primary purposes." *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, [402], 127 S.Ct. 1727, 1742 (2007).

In re ICON Health and Fitness, Inc., 496 F.3d 1374, 1379–80 (Fed. Cir. 2007) (a reference describing a folding bed found pertinent to appellant's folding treadmill).

Like our reviewing court, "[w]e will not read into a reference a teaching away from a process where no such language exists." *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1364 (Fed. Cir. 2006). Under the proper legal standard, a reference will teach away when it suggests that the developments flowing from its disclosures are unlikely to produce the objective of the invention. "A statement that a particular combination is not a preferred embodiment does

not teach away absent clear discouragement of that combination." *Syntex (USA) LLC v. Apotex, Inc.*, 407 F.3d 1371, 1380 (Fed. Cir. 2005). "The fact that the motivating benefit comes at the expense of another benefit . . . should not nullify its use as a basis to modify the disclosure of one reference with the teachings of another. Instead, the benefits, both lost and gained, should be weighed against one another." *Medichem, S.A. v. Rolabo S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) (citations omitted).

C. Obviousness over the Combination of Nigam (Ex. 1013) and Hariri (Ex. 1015)

Petitioner asserts that claims 1–7 are unpatentable as being rendered obvious by the combination of Nigam and Hariri. Pet. 32–38. Patent Owner disagrees. PO resp. 25–49.

i. Overview of Nigam (Ex. 1013)

Nigam is drawn to a system and method of handling implants, such as corneal implants. Ex. 1013, 1:10–13. Nigam teaches:

> To ensure that the implant is properly oriented, however, the implant is provided with special asymmetric markings, which the user views to make a determination that the implant is resting against the corneal surface in a proper orientation. Referring to FIGS. **18–20**, there are shown three examplary embodiments of asymmetric markings **94** that can be utilized to properly orient the lens implant. As shown by FIGS. **18** and **19**, the markings are preferably positioned in a clockwise orientation. In another embodiment, shown in FIG. **20**, a letter can be placed on the posterior surface of the implant. In this way, if the implant's posterior surface is placed onto the cornea surface, then the letter will not read properly. For instance, FIG. **20** shows the letter "a" on the posterior surface of the implant **92**. If the implant **92** is not positioned right side up on the cornea surface, then the letter will read backwards. In this embodiment, any letter can be used so long as it has an asymmetric design. For instance, "R", "P", "C", etc. It is to be understood, however, that other symmetrical

> or asymmetric markings and orientations can be used without deviating from the scope of the present invention.

Id. at 12:6–26.

Nigam teaches that the markings may be added using laser engraving or printing with ink. *Id.* at 12:27–28. Nigam teaches further "that various methods and techniques for placing the mark on the lens can be used." *Id.* at 12:32–34.

ii. Overview of Hariri (Ex. 1015)

Hariri is drawn to a collagen biofabric produced from amnion. Ex. 1015 ¶ 2. The biofabric has multiple uses, including ophthalmic, wound dressing, etc. *Id.* Hariri specifically teaches "a method for treating and/or preventing an eye related disease or disorder, e.g., ocular surface disease, in a subject, comprising using the collagen biofabric." *Id.* ¶ 28. Hariri also discloses the production of laminates. *Id.* ¶ 113. The laminates may be prepared by layering the decellularized membrane, and then drying the layered membrane, or by layering the dried membrane. *Id.* ¶¶ 115–116.

The decellurized amniotic membrane that is used in the production of the collagen biofabric may be dried on a mesh drying frame, such as a plastic drying frame or a stainless steel mesh. *Id.* ¶ 104. Hariri teaches "[t]he invention encompasses any dimensionality of the biofabric that is compatible for its use." *Id.* ¶ 120.

According to Hariri:

> The surface orientation of the collagen biofabric of the invention can be visually identified. The collagen biofabric of the invention has a "grid" pattern, which allows for the visual identification of the maternal and [f]etal surfaces by one skilled in the art. *In a specific embodiment, the surface orientation of the collagen biofabric is identified under magnification.* It will be appreciated by one skilled in the art that the fetal side of the

> collagen biofabric can be identified by its concave, i.e., recessed, grid pattern. Conversely, the maternal side can be identified by its convex, i.e., elevated grid pattern.

Id. ¶ 121 (emphasis added).

iii. Analysis

Petitioner presents a claim chart demonstrating where each of the limitations of the challenged claims may be found in Nigam and Hariri. Pet. 35–38. Specifically, Petitioner relies on Nigam for teaching a lens implant, as well as for teaching the use of an asymmetric marking to ensure that the implant is properly oriented. Pet. 15. The lens implant of Nigam, according to Petitioner, may be a hydrogel, but can also be other types of implants, such as tissue implants. *Id.* (citing Ex. 1013, 1:37–39). The asymmetric marking is used to ensure the correct side of the implant faces the cornea for implantation. *Id.* (citing Ex. 1013, 12:6–10). In particular, Petitioner notes that Nigam teaches the use of letters, such as "a," "R," etc., which are asymmetrical, and which are placed on the posterior surface of the implant. *Id.* (citing Ex. 1013, 12:15–23). Nigam teaches further, Petitioner asserts, that other asymmetric markings or designs may be used. *Id.* (citing Ex. 1013, 12:23–26). Petitioner notes that Nigam teaches that the label may be engraved into the tissue, or printed on the tissue using ink. *Id.* at 15–16 (citing Ex. 1013, 12:27–28). Petitioner contends, that as taught by Hariri (Ex. 1015, Abstract) and Dua (Ex. 1014), ocular tissue implants are often manufactured from placental tissue. *Id.* at 16.

Petitioner notes that Hariri teaches the preparation of laminated collagen biofabrics or grafts from placental membranes, which may be used, among other things, for blood vessel repair, wound dressing, surgical grafts, as well as ophthalmic uses. *Id.* at 32 (citing Ex. 1015, Abstract, ¶¶ 7, 14).

Hariri teaches also, Petitioner asserts, preparation of the biofabric by drying the membrane with its fetal side up on a drying frame. *Id.* (citing Ex. 1015 ¶ 20). Petitioner relies on Hariri for teaching "identification of the surface orientation of the membrane, distinguishing the maternal side from the fetal side, by examining the grid pattern created from the drying frame," noting that Hariri teaches that "magnification may be necessary to determine the surface orientation. Pet. 32–33 (citing Ex. 1015 ¶ 121).

Thus, Petitioner contends that "Hariri teaches the concept of imparting or molding a design into placental tissue that is capable of being viewed." *Id.* at 33. According to Petitioner, "Hariri's disclosure of concave (indented) and convex (raised) surfaces in the shape of a grid (design) falls within the scope of claims 2, 3, and 4." *Id.* Petitioner asserts, therefore, that it would have been obvious to the ordinary artisan to use the method of Hariri to engrave or emboss the asymmetric label taught by Nigam. *Id.* at 34 (citing Ex. 1002 ¶ 81). Petitioner asserts further that given Nigam's teaching of both laser engraving and labeling with ink, the ordinary artisan "would find it obvious to use a variety of equivalent tissue manipulation methods to impart a label onto the graft such as embossment and raised or indented texture." *Id.* at 16 (citing Ex. 1002 ¶ 42). Although the design of Hariri is taught to be visible with a microscope, Petitioner argues that it would have been obvious to make a design visible without the need for a microscope. *Id.* at 33.

Patent Owner contends "[t]here are a number of distinctions between Nigam" and the challenged claims in structure and function such that Nigam is not prior art to the claimed invention. PO Resp. 26 (citing Ex. 2023 ¶¶ 115–124). Patent Owner asserts that the devices of Nigam "are intended to

enhance storage, facilitate removal of corneal implants from storage, and improve retrieval and placement in the eye," wherein the implants are essentially prosthetic devices that are used to correct visual disorders. *Id.* at 26–27 (citing Ex. 1002 ¶ 36; Ex. 2023 ¶¶ 110–114). Specifically, Patent Owner argues, the system of Nigam is a unitary packaging system for synthetic hydrogel implants, and includes a bottle having an opening sealed by a stopper. *Id.* at 28 (citing Ex. 1013, 2:12–19; Ex. 2023 ¶¶ 110–118). In contrast, Patent Owner argues, the '687 patent is drawn to methods of creating placental tissue grafts, including using an asymmetric label to distinguish the two sides of the graft. *Id.* at 27 (citing Ex. 2023 ¶¶ 115–124). Patent Owner asserts also that the challenged claims do not require the enclosure device of Nigam. *Id.* at 28 (citing Ex. 1001, 9:56–58; Ex. 2023 ¶ 115). Additionally, Patent Owner argues, Petitioner in fact characterizes the system of Nigam as being unrelated to the invention of the '687 patent. *Id.* at 27 (citing Pet. 15–16).

Patent Owner contends, therefore, that Nigam is not analogous art as it is directed to a synthetic corneal lens. *Id.* at 25 (citing Ex. 2023 ¶¶ 108–134). Specifically, Patent Owner asserts "Nigam is directed to a system for packaging and storing corneal lens implants made of polymer," and is, thus, not in the same field of endeavor as the invention of the '687 patent, nor is it reasonably pertinent to the problem with which the inventor was involved. *Id.* at 26. According to Patent Owner, the corneal implants of Nigam "are both chemically and structurally distinct" from the placental tissue grafts of the challenged claims, differences that are recognized by the Food and Drug Administration. *Id.* at 28 (citing Ex. 2023 ¶¶ 56–64, 119–124). Furthermore, Patent Owner argues, the implants of Nigam are intended to be

permanent, whereas the claimed placental grafts are intended to heal wounds, and are not intended to be permanent. *Id.* at 28–29 (Ex. 2023 ¶¶ 122–123). Patent Owner argues also that the implants of Nigam must be hydrated, whereas the placental tissue grafts of the challenged claims are not transplanted or maintained in fluid. *Id.* at 30 (citing Ex. 1013, 2:27–32; Ex. 2023 ¶¶ 116–118). The label of the '687 patent is placed on the graft during manufacturing, and Patent Owner avers submersion might cause distortion of the label, or may cause an embossed label to disappear. *Id.* (citing Ex. 1001, 7:47–9:5; Ex. 2023 ¶¶ 116–118).

Patent Owner asserts also that the '687 patent and Nigam are directed to solving different problems. *Id.* Contrary to Petitioner's characterization that the '687 patent as being drawn to the labeling of a placental tissue graft, Patent Owner argues that the inventors faced a far more significant challenge, that is, "how to label a ***placental tissue graft*** such that the label ***visibly distinguishes*** one side from the other side, thereby permitting ***direct, visual determination*** of the orientation of said tissue graft." *Id.* at 30–31 (citing Ex. 2005 ¶¶ 7–11; Ex. 2023 ¶¶ 125–127). Specifically, Patent Owner asserts that the '687 patent "created a unique method of manufacturing placental tissue grafts that incorporated labeling of the graft," wherein the method prevents distortion of the label. *Id.* at 31 (citing Ex. 2005 ¶ 9; Ex. 2023 ¶¶ 127–128). According to Patent Owner, that was "particularly ground breaking because no one in the industry had incorporated labeling of a placental graft as part of manufacturing," and thus, "the inventors provided a solution that allowed for placement of the asymmetric label in a reproducible manner without compromising the integrity of placental tissue graft or distorting the label." *Id.* at 31–32 (citing Ex. 2005; Ex. 2023 ¶¶ 66,

76, 128, 185–187). Nigam, Patent Owner asserts, did not recognize any of those problems as it does not use placental tissue grafts, and is, therefore, non-analogous art. *Id.* at 32 (citing Ex. 2023 ¶¶ 125–134).

Petitioner responds that "Nigam, Dua, and Hariri are analogous art that teach methods for distinguishing between two sides of a tissue graft or implant," and also teach the use of a variety of labels. Reply 10. According to Petitioner, all three references teach use of the graft in ophthalmic procedures, although only Dua and Hariri specifically teach the use of placental tissue grafts. *Id.*

We are not persuaded that Nigam and Hariri are non-analogous art. The '687 patent relates to tissue allografts, and more particularly "to placental membrane tissue grafts (amnion and chorion) and methods of preparing, preserving, and medical uses for the same." Ex. 1001, 1:19–21. Nigam relates to storage and use of tissue allografts, and teaches that although the "implants are generally made of various types of hydrogels," they can also include tissue implants. Ex. 1013, 1:10–13, 37–39. Nigam teaches also that the implants have a variety of uses, including retinal and corneal implants. *Id.* at 1:18–21. Hariri relates to a biofabric produced from amnion that has multiple uses, including ophthalmic uses. Ex. 1015 ¶ 2. Moreover, both Nigam and Hariri discuss the need to be able to determine whether a tissue graft has been placed in the correct orientation. Ex. 1013, 12:6–10; Ex. 1015 ¶ 121. Thus, Nigam "logically would have commended itself to an inventor's attention in considering his problem," which, in the case of the challenged claims, is differentiating the two sides of a tissue graft. *Innovention Toys, LLC v. MGA Entm't, Inc.*, 637 F.3d 1314, 1321–22 (Fed. Cir. 2011).

As to Patent Owner's arguments concerning the differences between the implants of Nigam and the challenged claims, in determining whether obviousness is established by combining the teachings of the prior art, "the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art." *In re Keller*, 642 F.2d 413, 425 (CCPA 1981). In addition, a reference disclosure is not limited only to its preferred embodiments, but is available for all that it discloses and suggests to one of ordinary skill in the art. *In re Lamberti*, 545 F.2d 747, 750 (CCPA 1976). Here, we agree with Petitioner that it would have been obvious to the ordinary artisan to use the method of Hariri to engrave or emboss the asymmetric label taught by Nigam into tissue. Pet. 34 (citing Ex. 1002 ¶ 81).

In that regard, we note that Petitioner responds in its Reply, that it did not rely on Hariri alone to challenge the claims, as its proposed construction required the label itself to be asymmetric. Reply 9. Petitioner asserts that if we adopt Patent Owner's construction of an asymmetric label as simply permitting the user to distinguish one side of the graft from the other, Hariri meets that limitation. *Id.* Specifically, Petitioner notes that Patent Owner's expert, Dr. Chuck, acknowledged that the graft of Hariri has a grid pattern that allows the surface orientation to be determined under magnification. *Id.* at 5–7 (citing Ex. 2023 ¶ 43; Ex. 1019, 26:11–16, 68:14–17). Thus, Petitioner argues, under Patent Owner's construction of asymmetric label, Hariri teaches all the limitations of challenged claims 1–7. *Id.* at 9.

Given Patent Owner's construction of an "asymmetric label" as being "an identifier or marking of some kind that lacks some form of symmetry based on its design or its positioning on, and shape of, the tissue graft,

allowing for distinguishing one side of the graft from the other" (PO Resp. 10), we agree with Petitioner that the grid of Hariri meets that limitation, as the grid allows the user to distinguish the two sides of the placental graft. *See* Ex. 1015 ¶ 121; *see also* Ex. 1019, 26:11–16; 68:14–17 (Dr. Chuck testifying that the two sides of the graft could be differentiated under a microscope). Nigam provides additional evidence as to ways in which an asymmetric label may be used on a tissue graft that allows the ordinary artisan to distinguish one side of the graft from the other. *See* Ex. 1013, 12:6–26.

Moreover, as set forth in the section addressing claim construction, above, we decline to construe "permitting direct, visual determination" as being of a sufficient size to allow direct, visual determination to distinguish the two sides of the graft without the aid of assistive visual mechanisms. Thus, the grid of Hariri allows for direct visual determination of the two sides of the graft. In addition, Hariri teaches "[i]n a specific embodiment, the surface orientation of the collagen biofabric is identified under magnification." Ex. 1015 ¶ 121. Thus, Hariri suggests that in other embodiments, there may be no need of magnification to determine the orientation of the graft. Therefore, even if we were to the claim as requiring that the size label of the label be sufficient to allow direct, visual determination to distinguish the two sides of the graft without the aid of assistive visual mechanisms, Hariri renders such a label obvious.

Although Patent Owner asserts that the invention was "groundbreaking" as it allowed incorporation of the label as part of the manufacturing process, Hariri is evidence of the incorporation of a grid, which is a label or design, into a placental graft during the manufacturing

process before the relevant date of the '687 patent. We note moreover that although the claims are drawn to a method, they do not include any specific manufacturing steps other than "placing a label on a portion of at least one side of said tissue graft." Thus, the challenged claims encompass not only placement of the label during the drying step, but also encompass placing the label after the manufacturing step, such as through the use of ink as taught by Nigam.

Patent Owner contends further that the ordinary artisan would not have had a reason to combine Nigam and Hariri. PO Resp. 32 (citing Ex. 2023 ¶ 135). Specifically, Patent Owner argues that the techniques taught by Nigam, such as ink and lasers, could not be used to place a visible, asymmetric label on the placental tissue graft of Hariri, and Petitioner does not provide a reason "to add any additional or different labeling to the graft of Hariri." *Id.* (citing Ex. 2023 ¶¶ 136–158).

Patent Owner argues as to the laser engraving of Nigam that the ordinary artisan would understand that such treatment would damage the delicate placental tissue, making it unsuitable for clinical applications. *Id.* at 34 (citing Ex. 2023 ¶¶ 144–151). Patent Owner argues further that the ordinary artisan, contrary to the testimony of Dr. Mooradian, would not have used ink on the placental implant of Hariri "because of the possible negative results associated with such marking." *Id.* (citing Ex. 2016, 194:2–195:2; Ex. 2023 ¶¶ 152–158). According to Patent Owner, the application of ink to the placental tissue graft may cause it to rehydrate unevenly, comprising its integrity, and may also not result in a readable label. *Id.* (citing Ex. 2023 ¶¶ 152–158). Patent Owner asserts that the ink, which is water-based, may be absorbed, staining other portions of the placental tissue graft, distorting the

label, "rendering it difficult or impossible to use the label for a direct, visual determination of the orientation of the placental tissue graft." *Id.* at 35 (citing Ex. 2023 ¶ 154).

Patent Owner also contends that the ordinary artisan would not have been motivated to add ink to the placental tissue graft of Hariri. *Id.* (citing Ex. 2023 ¶ 156). Specifically, Patent Owner asserts that the ink may be permanent, which could negatively impact use of the graft, such as adversely impacting field of vision, "especially if the mark is of sufficient size to be visibly distinguishable so as to permit a direct, visual determination." *Id.* (citing Ex. 2023 ¶ 156). Moreover, according to Patent Owner, the mark may be cosmetically undesirable if the graft is placed at an exposed part of the body. *Id.* at 35–36 (citing Ex. 2023 ¶ 157).

We are not persuaded by any of Patent Owner's arguments here. Nigam not only teaches laser engraving, but also teaches labeling with indelible ink. Ex. 1013, 12:27–28. In addition, Hariri teaches a biofabric comprising a grid pattern that was embossed into the biofabric by drying the fabric on a mesh grid. Ex. 1015 ¶ 121. We, therefore, conclude that Petitioner has established by a preponderance of the evidence that the ordinary artisan would have understood that a variety of means could be used to impart the asymmetric mark of Nigam onto a placental tissue graft, including embossing the graft with a pattern during a drying step as taught by Hariri.

Patent Owner relies on testimony of Dr. Chuck to establish that the ordinary artisan would not use ink to label a tissue graft. *See* Ex. 2023 ¶¶ 152–158. Dr. Chuck testifies, for example:

> 155. [T]he ink may run across the graft, changing the shape and position of the intended marking, and eliminating the ability to use the label to distinguish one side from the other. In addition, the ink may run from one side of the graft to another (*e.g.*, stromal to basement), thus eliminating the ability to determine on which side the ink was originally placed.
>
> 156. Further, one of ordinary skill would not have been motivated to add ink to the placental graft of Hariri, because any ink that can leave a persistent mark on the placental tissue will remain present on the graft until the graft is resorbed into the application site. This could negatively impact the field of vision, especially if the mark is of sufficient size to be visibly distinguishable so as to permit a direct, visual determination.

Id. ¶¶ 155–156.

Dr. Chuck's testimony, however, does not cite to any data or evidence. *See* 37 C.F.R. § 42.65(a) ("Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight."). Dua, however, which Petitioner relies on also to challenge the claims, is evidence of the level of skill in the art, and also teaches that indelible ink may be used to mark a placental graft. Ex. 1014, 750–51; *see Ariosa Diagnostics v. Verinata Health, Inc.*, 805 F.3d 1359, 1365 (Fed. Cir. 2015) (noting that prior art "can legitimately serve to document the knowledge that skilled artisans would bring to bear in reading the prior art identified as producing obviousness."). Thus, in view of the express teachings of Nigam and Dua that one could use ink to label a graft such as a placental graft, we give Dr. Chuck's testimony in this regard little weight.

Patent Owner asserts further that it would not have been obvious to the ordinary artisan to emboss a placental tissue graft with an asymmetric label. PO Resp. 36 (citing Ex. 2023 ¶¶ 135–142, 222–223). As

acknowledged by Dr. Mooradian, Patent Owner asserts, Hariri teaches a method of imparting concave and convex surfaces in the shape of a grid onto the placental graft, and "provides *no reason* why a skilled artisan would have considered adding an alternative or additional method of determining the orientation of the Hariri graft." *Id.* at 36–37 (citing Ex. 2023 ¶¶ 137–142, 162–163). Patent Owner asserts further that Hariri also does not provide a reason to supplement or substitute its method of differentiating the two sides of the graft. *Id.* at 37 (citing Ex. 2023 ¶¶ 137–142, 162–163).

According to Patent Owner, the grid of Hariri is used by surgeons as a measuring tool when cutting the tissue grafts, which application was not recognized by Dr. Mooradian, "likely because he has never seen or used a placental tissue graft made according to Hariri." *Id.* (citing Ex. 2016 248:18–249:25). Because the grid is used as a measuring tool, Patent Owner argues that the ordinary artisan "would have *no* reason to remove the grid and substitute another marking, especially one that was microscopic (as in Nigam)." *Id.* (citing Ex. 2023 ¶¶ 140–142).

Patent Owner contends further that there would have been no reason for the ordinary artisan to add an asymmetric, visible label to the grid of Hariri, especially as it would add to the number of compressed regions in the graft of Hariri, resulting in weakening of the tissue. *Id.* (citing Ex. 2023 ¶¶ 135–142; 162–163, 222–223). Moreover, Patent Owner asserts, adding such a mark would interfere with the ability to use the grid of Hariri as a measuring tool. *Id.* at 38 (citing Ex. 2023 ¶¶ 140, 163). In fact, Patent Owner asserts, the commercial embodiment of the '687 patent only has an asymmetric label and does not contain a grid pattern, consistent with a

preferred embodiment of the '687 patent. *Id.* at 38 (citing Ex. 1001, 7:56–8:38; Ex. 2023 ¶¶ 141–142).

We are not persuaded. As discussed above, given Patent Owner's construction of an "asymmetric label," the grid of Hariri meets that limitation as the grid is used to visibly differentiate the two sides of the graft of Hariri. Ex. 1015 ¶ 121. In addition, Nigam teaches other ways in which the user may differentiate two sides of graft, including the use of asymmetric markings. Ex. 1013, 12:6–26. Thus, the ordinary artisan would have understood that either method may be used, depending on the needs of the user. And although the grid of Hariri may also be used as a measuring tool, that does not amount to teaching away from using another way to differentiate the two sides of the graft, such as replacing the grid with an asymmetric mark. *See Medichem*, 437 F.3d at 1165 (noting that benefits, both lost and gained, may be weighed against each other).

As to Patent Owner's argument that the ordinary artisan would not have added an additional, visible label to the grid of Hariri, as it would increase the areas of compression, as discussed above in our claim construction, the label need not be of a sufficient size to allow the label to be seen without the aid of assistive visual mechanisms. We have considered the testimony of Dr. Chuck, but it does not convince us otherwise. For example, Dr. Chuck testifies:

> In fact, one of ordinary skill in the art would not have been motivated to add additional markings to the tissue graft disclosed in Hariri, as one of ordinary skill in the art would have understood that doing so would increase the number of compressed regions in the tissue that are taught in Hariri. And, such a person would have understood that increasing the number

> of compressed regions would only further weaken the placental tissue which would not be desired.

Ex. 2023 ¶ 138.

Dr. Chuck again provides no data or evidence to support his opinion. The fact that the commercial embodiment of the '687 patent only has a label, and does not contain a grid pattern, does not change our analysis. Specifically, Hariri teaches the use of a grid that is embossed on the placental graft during the drying process, evidencing that the ordinary artisan would understand that a design could be imparted to the graft without damaging the integrity of the graft.

Patent Owner argues also that even if the ordinary artisan combined Nigam and Hariri, the combination fails to teach or suggest "placing a visible asymmetric label, let alone one that is embossed, a raised or indented texture, or a logo." PO Resp. 38. Patent Owner argues that "Petitioner and both experts agree that the Hariri grid pattern requires magnification for determination of the orientation of the graft." *Id.* at 39 (citing Pet. 33; Ex. 1002 ¶ 80; Ex. 2023 ¶ 170; Ex. 2006, 5, 7, Exs. 1 and 2). Thus, Patent Owner asserts, the grid of Hariri "does not allow for direct, visual determination as required by the 'placing a visible asymmetric label' limitation." *Id.* (citing Ex. 2023 ¶¶ 170–171).

Nigam does not remedy that deficiency, Patent Owner contends, as it is drawn to a corneal lens implant, and the ordinary artisan would understand the need for a small marking to prevent optical distortion. *Id.* (citing Ex. 2023 ¶¶ 164–169). According to Patent Owner, as both the markings of Hariri and Nigam are only visible through a microscope, they are not a visible, asymmetric label. *Id.* In fact, patent Owner asserts, the teaching of Nigam of a small mark, on the peripheral of the corneal lens implant, teaches

away from a visible, asymmetric mark, as required by the challenged claims. *Id.* at 40.

In particular, Patent Owner contends "one of the fundamental hallmarks of the '687 Patent was the ability to quickly distinguish the top and bottom sides of the tissue graft, *without the aid of assistive visual mechanisms* (*e.g.*, a microscope)." *Id.* at 41 (citing Ex. 1001, 1:49–64; 10:13–33; Ex. 2023 ¶ 171). Patent Owner asserts further that the '637 patent teaches that the asymmetric marking may be used for advertising or for quality control, "neither of which would be reasonably possible with the microscopic markings of Nigam." *Id.* (citing Ex. 1001, 2:33–36, 9:37–43).

As we have construed the term "visibly" above, however, the claims do not require that the label be visible without the aid of assistive visual mechanisms (*e.g.*, a microscope). In addition, Hariri teaches that in one embodiment the surface orientation of the collagen biofabric is identified under magnification (Ex. 1015 ¶ 121), suggesting that there would be other means to determine surface orientation, such as visualization without the need for magnification. Moreover, we agree with Petitioner (Pet. 33–34; Reply 19) that it would have been within the level of skill of the ordinary artisan to determine the proper size of an asymmetric label, including a size that would allow unaided visual determination, depending on the needs of the procedure in which it is being used. "A person of ordinary skill is also a person of ordinary creativity, not an automaton." *KSR*, 550 U.S. at 421; *see also id.* at 418 (noting that it is proper to "take account of the inferences and creative steps that a person of ordinary skill in the art would employ"). That finding is supported by the Specification of the '687 patent, which teaches

that "any size and shape arrangement can be used for the drying fixture, as will be appreciated by those skilled in the art." Ex. 1001, 8:10–12.

Patent Owner contends further that the combination of Nigam and Hariri would not have rendered obvious the placement of a visible asymmetric mark, as the ordinary artisan "would not have known *how* to successfully place an embossed asymmetric label on a placental tissue graft because this is the very process first invented by John Daniel, the inventor of the '687 Patent." PO Resp. 42 (citing Ex. 1001, 11:14–12:4; Ex. 2005 ¶¶ 2–3; Ex. 2023 ¶¶ 176–189).

According to Patent Owner, the '687 patent "teaches a novel and nonobvious placement of an asymmetric label on a placental tissue graft, using a specially designed drying frame." *Id.* (citing Ex. 1001, 8:50–54). In particular, Patent Owner asserts that the drying fixture had to overcome several obstacles to allow placement of an asymmetric label on a placental tissue graft. *Id.* (citing Ex. 2005 ¶ 8; Ex. 2023 ¶¶ 176–189). Patent Owner argues that placental tissues have a tendency to shrink significantly upon drying, in the absence of countervailing forces; thus, the drying rack for imparting an asymmetric label must have sufficient adherence to the graft to prevent the graft from shrinking too much or dislodging from the frame during the dehydration process. *Id.* at 42–43 (citing Ex. 2005 ¶ 9; Ex. 2023 ¶¶ 176–189). Patent Owner contends that the "development of the process to place an asymmetric label in the '687 Patent was a challenge and required significant experimentation to reduce the invention to practice." *Id.* at 43 (citing Ex. 2005 ¶ 10; Ex. 2023 ¶¶ 176–189).

We are again unpersuaded. Hariri evidences that the ordinary artisan would have known how to emboss a pattern onto a placental graft during the

drying process. We have considered the Declaration of the inventor, John Daniel, which was submitted during prosecution, but it does not convince us otherwise. Ex. 2005.[4] The Declaration states, for example,

> Hariri dries the placental tissue on a plastic mesh drying frame. . . . . The tissue graft obtained by Hariri's process does not bear a visibly distinguishable asymmetric label but a grid pattern that is difficult to ascertain a desirable side of the tissue graft.

Id. ¶ 12.

As the claims have been construed, however, the grid of Hariri is encompassed by the asymmetric label required by the challenged claims. Moreover, the Declaration does not explain why it is difficult to ascertain the two sides of the graft, nor does it cite evidence to that effect.

Patent Owner argues further that the engraving taught by Nigam and the embossing of the invention of the '687 patent differ as to when the mark is placed. PO Resp. 45. Patent Owner contends that the engraving of Nigam is performed after the implant has been formed, whereas embossing is done during the dehydration process. *Id.* at 45–46 (citing Ex. 1013, 12:6–10; Ex. 2023 ¶ 191–194). Dr. Mooradian, Patent Owner asserts, testified that embossing can occur after formation of the graft, which is wrong according to Patent Owner. *Id.* at 46 (citing Ex. 1016, 157:19–160:1; 162:20–163:11). Patent Owner asserts that Dr. Mooradian is applying "a layman's understanding of engraving and/or embossing *other* dissimilar materials . . . rather than the understanding of a skilled artisan regarding engraving and embossing a placental tissue graft." *Id.* (citing Ex. 2016, 162:20–163:11). Patent Owner argues that "Petitioner's analysis is nothing more than

[4] We note that the John Daniel's Declaration was not tested by cross-examination.

hindsight reasoning, which finds its only 'support' in the conclusory testimony of its own expert witness who has never used or marked placental tissue." *Id.* at 47.

We are unpersuaded. Although the challenged claims are drawn to methods, all that is required by independent claim 1 is the step of "placing an asymmetric label on a portion of at least one side of said tissue graft." There is no limitation that the label need be placed on the tissue graft during the drying step. The claims, therefore, encompass methods in which the label is added after drying, such as using ink as taught by Nigam. Moreover, even if the claims were so limited, Hariri teaches embossing a design, that is, a grid, onto a placental tissue graft during the drying process.

We also disagree with Patent Owner that Petitioner's combination of Nigam and Hariri is based on impermissible hindsight analysis. As noted by Petitioner, Nigam teaches the use of asymmetric labels to differentiate the sides of a tissue lens implant, and Hariri teaches molding a grid into a placental tissue graft during the drying step, which also allows for differentiation of the two sides of the graft. Pet. 33. The Supreme Court has emphasized that "the [obviousness] analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *KSR*, 550 U.S. at 418. "If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. *Id.* Under the correct obviousness analysis, "any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." *Id.* at 420. Here, a problem addressed by both Nigam

and Hariri is differentiating two sides of a tissue graft, thus, providing a reason for their combination.

Patent Owner argues further that for the same reasons that the combination of Nigam and Hariri does not render obvious an asymmetric label that is an embossment, it also does not render obvious an asymmetric label that has a raised or indented texture. PO Resp. 48 (citing Ex. 2023 ¶¶ 195–196). That argument is not convincing for reasons already discussed above.

Patent Owner contends that Petitioner does not even address the limitation that the asymmetric label is a logo. PO Resp. 48. Moreover, Patent Owner argues that Petitioner has not established that the combination of Nigam and Hariri renders such a label obvious for the same reasons discussed above as to placement of an asymmetric label. *Id.* at 48–49.

The only claim that recites a logo is claim 4, which recites "[t]he method of claim 1, wherein said label is a logo, a design, a name, or text." Thus, claim 4 does not require that a logo be present, but only that one of a logo, design, name, or text be present. As discussed above, Hariri teaches a grid (Ex. 1015 ¶ 121), which would be a design as recited by claim 4. In addition, Nigam teaches the use of text. Ex. 1013, 12:15–26; Fig. 20. Thus, the combination of Nigam and Hariri teaches all of the limitations of claim 4.

According to Patent Owner, "Dr. Mooradian's use of Nigam as prior art is based on a fundamental misunderstanding of the differences between the synthetic lenses of Nigam and placental tissue." PO Resp. 29. Specifically, Patent Owner argues that "Dr. Mooradian freely admitted that '[he] do[es not] know how [the synthetic lenses of Nigam and placental

tissue] necessarily differ.'" *Id.* (alterations original) (citing Ex. 2016, 143:12–13). Patent Owner argues that, contrary to the testimony of Dr. Mooradian, placental tissue could not be used "to change the shape of the cornea to solve the optical disorders solved by the corneal implants of Nigam." *Id.* (citing Ex. 2016, 136:12–137:5, 260:18–261:2; Ex. 2023 ¶¶108–124, 131–133).

We do not find Patent Owner's position convincing in this regard, as we can accord appropriate weight to an expert's testimony, taking into account the expert's understanding of the level of skill in the art at the time of the invention. *See, e.g., Yorkey v. Diab*, 601 F.3d 1279, 1284 (Fed. Cir. 2010) (holding the Board has discretion to give more weight to one item of evidence over another "unless no reasonable trier of fact could have done so"); *In re Am. Acad. of Sci. Tech Ctr.*, 367 F.3d 1359, 1368 (Fed. Cir. 2012). Although certain portions of the Declaration of Dr. Mooradian may be entitled to little weight, the references relied upon by Petitioner speak for themselves. In that regard, we note that the Petitioner's contentions as to the challenge of claims 1–7 are fully supported by the references relied upon by Petitioner to demonstrate the unpatentability of the claims.

After considering Petitioner's arguments and evidence, as well as the evidence and arguments presented by the Patent Owner in response, we agree with Petitioner and are persuaded that the Petition demonstrates by a preponderance of the evidence the unpatentability of claims 1–7 over the combination of Nigam and Hariri. We address Patent Owner's evidence of secondary considerations below, which need be considered before our final determination of whether the claims have been shown to be obvious by a preponderance of the evidence.

D. Obviousness over the Combination of Dua (Ex. 1014) and Hariri (Ex. 1015)

Petitioner contends that claims 1–7 are unpatentable as obvious over the combination of Dua and Hariri. Pet. 39–45. Patent Owner disagrees. PO Resp. 49–57.

i. Overview of Dua (Ex. 1014)

Dua is an overview of transplantation of amniotic membrane. Ex. 1014, 748, Title. Dua teaches specifically that the use of "amniotic membrane transplantation (AMT) in the management of ocular surface disorders is ever increasing." *Id.*

According to Dua:

> The membrane is always sutured to the ocular surface with its epithelial side up and the mesenchymal surface in contact with the eye, to facilitate adherence of the membrane to the ocular surface. For this reason it is important to be able to distinguish its two surfaces. This is easiest when the membrane is fresh, but when dealing with membranes that have been thawed after storage at -70°C it becomes difficult. Most surgeons have developed a technique that suits them best—for example, mounting the membrane on nitrocellulose paper, the right way up, so that the correct side can be determined when the membrane is thawed. Others will use a suture, with the knot as the marker or indelible marker pen, to mark one side of the membrane. We have developed a method that we find useful. After spreading the membrane on the ocular surface we apply the tips of a blunt fine forceps to one surface of membrane and pinch lightly with the forceps and lift. A fine strand of "vitreous-like" substance can usually be drawn up from the mesenchymal but not the epithelial (basement membrane) side of the amniotic membrane.

Id. at 750–51.

ii. Analysis

Petitioner presents a claim chart demonstrating where each limitation of the challenged claims may be found in Dua and Hariri. Pet. 42–45. Specifically, Petitioner cites Dua for teaching the use of amniotic membrane, acquired from placenta, for ophthalmic uses, and specifically, its use as a transplanted basement membrane. Pet. 20 (citing Ex. 1014, 748). In particular, Petitioner notes that Dua "expressly teaches that the amniotic membrane should be sutured to the surface of the eye with the 'epithelial side up and the mesenchymal surface in contact with the eye, to facilitate adherence of the membrane to the ocular surface.'" *Id.* (quoting Ex. 1014, 750).

According to Petitioner, Dua teaches several methods of distinguishing one side of the implant from the other, such as using a suture knot, indelible ink, mounting on nitrocellulose paper with a predetermined side up, or using blunt forceps to produce a fine strand of vitreous-like substance from the mesenchymal side. *Id.* (citing Ex. 1014, 750–51). Petitioner asserts that if an indelible pen is used to generate the mark, the ordinary artisan would understand that the use of an asymmetric mark, such as an asymmetric letter, as it would allow the user to differentiate one side from the other. *Id.* at 21 (citing Ex. 1002 ¶ 56).

An overview of Hariri is provided above. Petitioner relies on Hariri as discussed above with respect to the challenge based on the combination of Nigam and Hariri. *Id.* at 39–40. According to Petitioner, the ordinary artisan would have "combine[d] the elements of Dua and Hariri because both teach utilization of labels to distinguish the basement and stromal sides of a placental tissue graft; both utilize three-dimensional components for the

labels, and both labels achieve the same purpose." *Id.* at 40 (citing Ex. 1002 ¶ 92). Petitioner further asserts "it would be obvious to substitute the grid design, or add to the grid design, of Hariri, an asymmetrical marking taught by Nigam as they would result in the same intended purpose – to distinguish between the sides of the placental tissue graft." *Id.* at 41. Moreover, Petitioner contends that the grid of Hariri, as well as the knot of Dua, would serve as a logo, design, name, or text. *Id.* (citing Ex. 1002 ¶ 59).

Patent Owner responds that Petitioner fails to provide a reason to combine Dua with Hariri. PO Resp. 49. In fact, Patent Owner asserts, Hariri teaches away from the combination by teaching that the methods described in Dua carry shortcomings. *Id.* at 49–50 (citing Ex. 1015 ¶ 9).

Patent Owner asserts that Petitioner's reasoning that the ordinary artisan would have combined Dua and Hariri to arrive at the challenged claims "because both references teach the use of labels to distinguish the sides of a placental tissue graft using 'three-dimensional components' for labels thus achieving the same purpose of the asymmetric label" of the challenged claims "miss[es] the mark." *Id.* at 50. Specifically, Patent Owner asserts that one of the benefits of the present invention is that the user can look at the graft and know the proper orientation, without requiring three-dimensional examination and manipulation. *Id.* (citing Ex. 2023 ¶¶ 80, 232). Moreover, Patent Owner argues that Dua "advocates a method for determining orientation of an amniotic graft using the inherent physical properties of the graft rather than a label." *Id.* Patent Owner argues although Dua discusses historical methods used by surgeons for labeling amniotic grafts in operating rooms, Dua ultimately uses the sticky nature of

the stromal side, discouraging the labeling of the amniotic graft. *Id.* at 50–51 (Ex. 1014, 750–51; Ex. 2023 ¶¶ 206, 209–211, 213).

We are unpersuaded. As Patent Owner acknowledges (PO Resp. 50), Petitioner does provide a reason to combine Dua with Hariri. Specifically, according to Petitioner, the ordinary artisan would have combined Dua with Hariri as both references "teach utilization of labels to distinguish the basement and stromal sides of a placental tissue graft; both utilize three-dimensional components for the labels, and both labels achieve the same purpose of the asymmetric label of the '687 Patent." Pet. 40. We are not persuaded by Patent Owner's argument that Petitioner's reasoning is deficient, because, according to Patent Owner, a benefit of the present invention is that one can look at the implant and determine the proper orientation. As discussed above, we decline to interpret the claims as requiring that the label be visible without the aid of assistive visual mechanisms. Thus, the use of a knot, indelible ink, or drawing up a portion of the vitreous substance from the mesenchymal side of the amniotic membrane as taught by Dua, as well as the grid of Hariri, visibly distinguish the two sides of the graft as construed above.

Moreover, as also discussed, Hariri teaches "[i]n a specific embodiment, the surface orientation of the collagen biofabric is identified under magnification." Ex. 1015 ¶ 121. Thus, a reasonable inference is that in other embodiments of Hariri, there may be no need of magnification to determine the orientation of the graft. And although Dua's preferred method of labeling the graft uses the sticky side of the graft to draw up a vitreous-like substance, does not amount to a teaching away of other methods of labeling in order to differentiate one side of the graft from the other. *See*

Merck & Co. Inc. v. Biocraft Laboratories Inc., 874 F.2d 804, 807 (Fed. Cir. 1989) ("[I]n a section 103 inquiry, 'the fact that a specific [embodiment] is taught to be preferred is not controlling, since all disclosures of the prior art, including unpreferred embodiments, must be considered.'").

We have also considered Hariri's discussion of Dua, but do not find that disclosure teaches away from the combination. *See* Ex. 1015 ¶ 9. Specifically, Hariri teaches:

> Numerous attempts in the field to optimize the preparation and preservation of the amniotic membranes for use in transplantation have been previously described (see e.g., Dua et al., 1999, *Br. J. Opthalmol.* 83: 748–52 ("Dua") for a review). Various preparation of amniotic membranes have included preservation by saline and antibiotic mixtures, alcohol dehydration with or without separation of the amniotic layer from the chorionic layer. However, all of the methods described in Dua, and in the references described above still carry shortcomings that need to be addressed by improvements in preparation and preservation of amniotic membranes

Id.

As can be seen from the above disclosure, Hariri is discussing methods of preparing and preserving the grafts, and is not discussing labeling of the graft in order to differentiate the two sides of the graft. Moreover, while the methods of Dua may have shortcomings, Hariri does not teach that the methods of Dua are unlikely to work. *See Baxter Int'l, Inc. v. McGaw, Inc.*, 149 F.3d, 1321, 1328 (Fed. Cir. 1998) (noting that in general, "a reference will teach away if it suggests that the line of development flowing from the reference's disclosure is unlikely to be productive of the result sought by the applicant.").

Patent Owner argues that the markings of Dua of are incompatible with the dehydrated graft of Hariri. PO Resp. 51. In particular, Patent

Owner asserts that both experts agree that a suture can cause tearing of the placental graft, which is even more likely with a knot, which, if pulled tight, can cause the graft to bunch and possibly tear. *Id.* (citing Ex. 2016: 228:19–299:1; Ex. 2023 ¶¶ 211–212).

Patent Owner further contends that Dr. Mooradian "proposes marking the dehydrated graft of Hariri with an indelible ink as taught in Dua." *Id.* (footnote omitted). Relying on its arguments above with respect to the combination of Nigam and Hariri, Patent Owner asserts that the ordinary artisan "would have understood that marking a dehydrated placental tissue with ink in the proposed manner is challenging and unlikely to be successful. *Id.* (citing Ex. 2023 ¶¶ 213–218). The ordinary artisan would have understood also, Patent Owner asserts, that there was no strand of vitreous substance to lift as taught by Dua on the dehydrated placental graft of Hariri. *Id.* at 51–52 (citing Ex. 2023 ¶ 220).

We are not persuaded. The teachings of Dua are not limited to a knot or pulling up vitreous substance, but Dua teaches other methods of marking a graft to differentiate one side from the other, as does Hariri. Specifically, Dua teaches that indelible ink may be used, and Hariri teaches the use of a grid that is embossed into the graft during the drying process. Moreover, as noted above as to the combination of Nigam and Hariri, both Dua and Nigam teach the use of ink to place a mark on a placental graft in order to differentiate one side of the graft from the other. Ex. 1014, 750–51; Ex. 1013, 12:27–28.

Patent Owner responds further that the combination of Dua and Hariri does not teach all of the elements of the challenged claims. PO Resp. 52. Patent Owner argues that, as discussed as to the combination of Nigam and

Hariri, "it was not obvious to emboss a placental tissue graft with an asymmetric label, nor was it known in the art how to do so." *Id.* (citing Ex. 2005; Ex. 2023 at ¶¶ 183–189, 225–230).

According to Patent Owner, Dr. Mooradian, states that it would have been obvious to increase the size of the grid of Hariri so that the grid will be visible without the need for a microscope. *Id.* (citing Ex. 1002 ¶ 90). Patent Owner contends, however, that simply increasing the size of Hariri would not provide a visible asymmetric label. *Id.* at 52–53 (citing Ex. 2023 ¶ 172). Patent Owner asserts further that "Hariri's grid pattern does not distinguish the sides of the graft in a manner equivalent to the claimed visible asymmetric label that is an embossment," and that the methods of marking taught by Dua are not "equivalent to placement of a visible asymmetric label that is an embossment." *Id.* at 53 (citing Ex. 2023 ¶¶ 206–210, 221, 231–232).

Specifically, Patent Owner argues that the ordinary artisan would not consider the grid of Hariri to be equivalent to the asymmetric label of the challenged claims. *Id.* at 54 (citing Ex. 2023 ¶ 221). According to Patent Owner, that was recognized by the United States Patent and Trademark Office during the prosecution of a related application. *Id.* (citing Ex. 2010, 4–5, Ex. 2011, Reasons for Allowance, 2). Moreover, Patent Owner argues, the graft of Hariri does not have a visible, asymmetric label, but is rather a symmetric grid pattern that requires a microscope to differentiate the two sides of the graft. *Id.* (citing Ex. 2006, 5–8; Ex. 2023 ¶ 221).

We are not persuaded by Patent Owner's arguments. As has been discussed above, we decline to construe challenged claim 1 such that the asymmetric label be visible without the aid of assistive visual mechanisms.

Thus, both Dua and Hariri teach an asymmetric label as required by the claims, as both references teach the use of a label or mark that allows for the two sides of the graft to be visibly differentiated.

We have considered the prosecution history cited by Patent Owner, but it does not convince us otherwise. In particular, in the Reasons for Allowance cited by Patent Owner, the Examiner stated that the "drying fixture used in the instant invention is critical for successfully producing the dried graft because, unlike a mesh, it provides consistent drying surface to the entirety of the tissue graft, which is critical to prevent dislodging, shrinking, distortion and tearing upon removal." Ex. 2011, Reasons for Allowance, 2 (citing a Declaration filed by Dr. John Daniels in application number 13/569,131). The Examiner also notes, however, that "the instant claims require the drying fixture to contain raised or indented asymmetric textures within a product space and otherwise smooth surfaces" (*id*.), which limitations are not required by the challenged claims in the instant proceeding. Thus, Patent Owner has not established the relevance of that prosecution history to the requirements of the claims challenged in the instant proceeding.

Patent Owner argues also that Dua does not teach a method of marking a placental graft that is equivalent to the embossment process of the challenged claims. PO Resp. 55. According to Patent Owner, the methods taught by Dua for determining the orientation of the graft require manipulation of the tissue, including the placement of ink, use of a knot, and pinching/pulling of the tissue. *Id*. The embossment of the challenged claims, however, Patent Owner asserts, require no manipulation to determine

orientation, thus avoiding "the damage that would likely be caused by the methods of Dua." *Id.* (citing Ex. 2023 ¶¶ 231–232).

Moreover, Patent Owner contends that contrary to the testimony of Dr. Mooradian (Ex. 1002, 63), the ordinary artisan would understand that the methods of marking the graft taught by Dua were done during the surgery, and Dua does not teach any methods of marking the graft during the manufacturing process. *Id.* (citing Ex. 2023 ¶¶ 234–236). Patent Owner argues, in contrast, "the claimed invention imparts a visible asymmetric label onto at least one side of a placental tissue graft during manufacturing that allows direct, visual determination without manipulation of the tissue and without compromising the integrity of the tissue." *Id.* (citing Ex. 2023 ¶¶ 80, 232).

We are not persuaded. As previously discussed as to the combination of Nigam and Hariri, although the challenged claims are drawn to methods, all that is required by independent claim 1 is the step of "placing an asymmetric label on a portion of at least one side of said tissue graft." There is no limitation that the label need be placed on the tissue graft during the drying step. The claims, therefore, encompass methods in which the label is added after drying, such as using ink as taught by Dua. Moreover, even if the claims were so limited, Hariri teaches embossing a design, that is, a grid, onto a placental tissue graft during the drying process.

Patent Owner argues further that for the same reasons that the combination of Dua and Hariri does not render obvious an asymmetric label that is an embossment, it also does not render obvious an asymmetric label that is a raised or indented texture. PO Resp. 56 (citing Ex. 2023 ¶ 228). That argument is not convincing for the reasons already discussed above.

Patent Owner contends that according to Petitioner, the ordinary artisan would consider the knot of Dua to be a design, logo, name, or text. PO Resp. 57 (citing Pet. 41). Patent Owner asserts that Petitioner does not explain why that would be the understanding of the ordinary artisan, and argues that Petitioner's statement "is completely unsupported and incorrect." *Id.* (citing Ex. 2023 ¶ 233). According to Patent Owner, the ordinary artisan "would have understood that it would be challenging, if not impossible, to mark the tissue of Dua with a legible logo or writing – the ink would run across the graft." *Id.* (citing Ex. 2023 ¶¶ 213–218).

We are not persuaded. It is unclear why the knot of Dua would not be a design, as it has a form. Moreover, Dua specifically teaches the use of indelible ink, which would need be placed necessarily on the graft in a design. We have considered the Declaration of Dr. Chuck as evidence that the ordinary artisan would not use ink on a placental graft, but as noted above in the discussion of the challenge over Nigam and Hariri, Dr. Chuck provides no data or evidence to support his opinion entitling it to little weight.

After considering Petitioner's arguments and evidence, as well as the evidence and arguments presented by the Patent Owner in response, we agree with Petitioner and are persuaded that the Petition demonstrates by a preponderance of the evidence the unpatentability of claims 1–7 over the combination of Dua and Hariri. We address Patent Owner's evidence of secondary considerations below, which need be considered before our final determination of whether the claims have been shown to be obvious by a preponderance of the evidence.

E. Secondary Considerations

Factual inquiries for an obviousness determination include secondary considerations based on objective evidence of nonobviousness. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). The totality of the evidence submitted may show that the challenged claims would not have been obvious to one of ordinary skill in the art. *In re Piasecki*, 745 F.2d 1468, 1471–72 (Fed. Cir. 1984). Before we make our final obviousness determination, we must consider the evidence of obviousness anew in light of any evidence of secondary considerations of nonobviousness presented by Patent Owner. *See Graham*, 383 U.S. at 17–18 ("Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or nonobviousness, these inquiries may have relevancy."); *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1349 (Fed. Cir. 2012) ("This objective evidence must be 'considered as part of all the evidence, not just when the decision maker remains in doubt after reviewing the art.'") (quoting *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538–39 (Fed. Cir. 1983)). Secondary considerations may include any of the following: long-felt but unsolved needs, failure of others, unexpected results, commercial success, copying, licensing, and praise. *See Graham*, 383 U.S. at 17; *Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007).

In addition, there must be a nexus between the merits of the claimed invention and the evidence of secondary considerations. *In re GPAC Inc.*, 57

F.3d 1573, 1580 (Fed. Cir. 1995). "Nexus" is a legally and factually sufficient connection between the objective evidence and the claimed invention, such that the objective evidence should be considered in determining nonobviousness. *Demaco Corp. v. F. Von Langsdorff Licensing Ltd.*, 851 F.2d 1387, 1392 (Fed. Cir. 1988). The burden of showing a nexus lies with the patent owner. *Id*. Showing nexus requires showing that any alleged success is not due to prior art or unclaimed features. *Asyst Techs., Inc. v. Emtrak, Inc*., 544 F.3d 1310, 1316 (Fed. Cir. 2008) ("[E]ven though commercial embodiments . . . have enjoyed commercial success, Asyst's failure to link that commercial success to the features of its invention that were not disclosed in Hesser undermines the probative force of the evidence pertaining to the success of Asyst's and Jenoptik's products."); *Ormco,Corp. v. Align Tech., Inc*., 463 F.3d 1299, 1312 (Fed. Cir. 2006) ("[I]f the commercial success is due to an unclaimed feature of the device, the commercial success is irrelevant. So too if the feature that creates the commercial success was known in the prior art, the success is not pertinent.").

Here, Patent Owner argues that copying by others, industry acquiescence, long-felt need, and failure by others, supports the patentability of the challenged claims. PO Resp. 57–60.

Specifically, Patent Owner contends "[o]thers in the industry have copied the claimed invention, most notably, Claims 2–4, by using an embossed asymmetric logo that imparts a raised or indented texture to the placental tissue graft." PO Resp. 58 (citing Exs. 2017–2019; Ex. 2023 at ¶¶ 242–247). Patent Owner asserts that those grafts "practice all of the

claimed elements of Claims 2–4, including placement of an asymmetric label for determination of the orientation of the tissue graft." *Id.*

Copying, as objective evidence of nonobviousness, requires evidence of effort to replicate a specific product, which may be demonstrated through "internal company documents, direct evidence such as disassembling a patented prototype, photographing its features, and using the photograph as a blueprint to build a replica, or access to the patented product combined with substantial similarity to the patented product." *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010); *Iron Grip Barbell Co., Inc. v. USA Sports, Inc.*, 392 F.3d 1317, 1325 (Fed. Cir. 2004). Like other types of objective evidence, evidence of copying must be shown to have a nexus to the claimed invention. *Wm. Wrigley Jr. Co. v. Cadbury Adams USA LLC*, 683 F.3d 1356, 1364 (Fed. Cir. 2012).

Petitioner responds that Patent Owner's evidence of copying "is entitled to no weight because it has not provided any evidence of copying after the '687 Patent was issued," as the evidence predates the December 3, 2013 date on which the '687 patent was issued. Reply 22 (citing Exhibit 2017 (showing a copyright date of 2012); Exhibit 2018 (showing a document date of March 2013); Exhibit 2019 (showing a copyright date of 2012)). Specifically, Petitioner asserts that as Dr. Chuck testified, "the [competitors'] embossed design with a raised texture was removed around the same time that the claims of the 687 Patent were allowed or issued." *Id.* (quoting Ex. 2023 ¶ 248).

Moreover, Petitioner asserts, Patent Owner does not provide any evidence that any competitors expended resources and time to design around the patented claims, prior to copying them. *Id.* at 22–23. Petitioner argues

"Patent Owner's expert concedes there was very little time, if any, between the competitors switch from an embossment to a notch." *Id.* (citing Ex. 2023 ¶ 248; Ex. 1019, 121:19–122:12).

We agree with Petitioner that Patent Owner's evidence of copying is entitled to little weight, as the products that Patent Owner is relying upon are the same products it relies upon to show industry acquiescence, discussed below. *See* Exs. 2017–2019. That is, Patent Owner argues also the embossment on those products was changed to a notch because of the issuance of the '687 patent. PO Resp. 59. Thus, it is unclear if Patent Owner's position is that the embossment was changed because of the issuance of the '687 patent, or, in the alternative, that the embossment was copied from the '687 patent. Moreover, Patent Owner has not identified a specific product that has been copied, but only alleges copying of the patent claims. The mere fact that the products identified by Patent Owner may have at one time had an embossment, without more, is insufficient to demonstrate effort to replicate a specific product. Accordingly, Patent Owner's evidence of copying is entitled to little weight.

As to industry acquiescence, Patent Owner contends that several competitors "have acquiesced to the validity of Claims 2–4 of the '687 Patent," as evidenced by their attempt to design around those claims. PO Resp. 59. According to Patent Owner:

> [S]everal competing placental tissue grafts once included an embossed logo but now utilize a small notch to indicate the proper orientation of the graft (*compare* Exs. 2017–2019 with Exs. 2020–2022; Ex. 2023 at ¶¶ 248–252). This change occurred *after* the issuance of the '687 Patent (Ex. 2023 at ¶¶ 248–255) and appear to have occurred only because of the issuance of the '687 Patent. Notably, there is no discernible reason why one

> would switch from the embossed logo to the notch, other than to avoid Claims 2–4 (Ex. 2023 at ¶¶ 248–255).

Id.

Patent Owner asserts further that the use of a notch has drawbacks, such as it cannot be used once it has been removed upon sizing of the tissue, and it removes part of the graft that would otherwise be available to the surgeon. *Id.* (citing Ex. 2023 ¶¶ 252–254).

Petitioner responds that "Patent Owner's argument rests solely on the anecdotal evidence that the competitors switched from the embossed design to a notch as a result of the validity of claims 2–4 of the '687 Patent." Reply, 23. In particular, Patent Owner notes that Patent Owner and its expert, Dr. Chuck, failed to consider that competitors may have switched in order to avoid litigation. *Id.* at 24. In addition, Petitioner argues that Patent Owner has not demonstrated that competitors switched to a notch because of the '687 patent, or other patents of Patent Owner which also have claims drawn to labeling placental tissue with an embossment. *Id.* at 24–25 (citing U.S. Pat. No. 8,460,714; U.S. Pat. No. 8,460,714).

Patent Owner presents evidence that three placental grafts, apparently sourced by Musculoskeltal Transplant Foundation ("MTF"), and possibly Liventa (*compare* Ex. 2019, 3 (AmnioClear product brochure stating that AFCell is proud to partner with MTF), *with* Ex. 2021, 3 (stating that AmnioClear is a product of Liventa)) changed from a clockwise arrow embossment (Exs. 2017–2019) to a notch (Exs. 2020–2022). It is unclear from Patent Owner's evidence, however, what proportion of the industry those companies represent, and thus fails to establish general industry acquiescence.

We also agree with Petitioner that Patent Owner has not demonstrated that the change from an embossment to a notch was due to the claims of the '687 patent. Patent Owner relies on the testimony of Dr. Chuck to establish that the products were modified because of the claims of the '687 patent. Specifically, Dr. Chuck testifies:

> I understand that the orientation of the MTF graft and the AmnioClear graft can be determined based on the location of this notch. I can think of no benefit to removing the embossed logo, other than to avoid infringing claims 2–4 of the 687 Patent.

Ex. 2023 ¶ 253. Dr. Chuck's assertion that the products were changed because of claims 2–4, without providing any data or underlying evidence, however, is entitled to little weight.

Accordingly, Patent Owner's evidence of industry acquiescence is entitled to little weight.

As to long-felt need and failure by others, Patent Owner contends that there was a need for an easy way to differentiate "between the two sides of a placental tissue graft that did not require manipulation of the tissue or examination of the tissue under a microscope," and that others tried but failed to design such a labeling method. PO Resp. 59–60 (citing Ex. 2023 ¶¶ 256–263).

"Longfelt need is closely related to failure of others. Evidence is particularly probative of obviousness when it demonstrates that a demand existed for the patented invention, and that others tried but failed to satisfy the demand." *In re Cyclobenzaprine Hydrochloride Extended-Release Capsule Patent Litig.*, 676 F.3d 1063, 1082 (Fed. Cir. 2012).

Petitioner responds that "Patent Owner's expert contradicts this position through his acknowledgement that he determined the sidedness of a

placental tissue graft using Hariri's grid." Reply 25 (citing Ex. 1019, 26:11–16). Thus, Petitioner asserts, Hariri had already solved the need identified by Patent Owner.

We agree with Petitioner that Hariri is evidence that there was not a long-felt need for the claimed invention, as Hariri teaches a placental graft with a grid that allows for differentiation between the two sides of the graft. Ex. 1015 ¶ 121. Accordingly, Patent Owner's evidence of a long-felt but unmet need is entitled to little weight.

F. Summary as to Obviousness

We conclude that Petitioner's evidence of obviousness of the challenged claims over the combination of Nigam and Hariri, as well as the combination of Dua and Hariri, when considered and weighed with Patent Owner's weak evidence of secondary considerations, establishes by a preponderance of the evidence that claims 1–7 of the '687 patent are unpatentable under 35 U.S.C. § 103(a).

III. CONCLUSION

After considering Petitioner's and Patent Owner's positions and evidence, we conclude that Petitioner has demonstrated by a preponderance of the evidence that claims 1–7 of the '687 patent are unpatentable under 35 U.S.C. § 103(a) over the combination of Nigam and Hariri, as well as the combination of Dua and Hariri.

IV. ORDER

Accordingly, it is hereby:

ORDERED that Petitioner shown by a preponderance of the evidence that claims 1–7 of the ’687 patent are unpatentable under 35 U.S.C. § 103(a); and

FURTHER ORDERED that, because this is a final written decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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