

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

DEVELOPMENTAL TECHNOLOGIES, LLC,
Petitioner,

v.

E. M. P. ENTERPRISES, INC.,
Patent Owner.

IPR2021-01534
Patent 10,091,956 B2

Before JAMES A. TARTAL, RICHARD H. MARSCHALL, and
MATTHEW S. MEYERS, *Administrative Patent Judges*.

MARSCHALL, *Administrative Patent Judge*.

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

Petitioner, Developmental Technologies, Inc. (“Petitioner”), filed a Petition requesting *inter partes* review of claims 1–18 (the “challenged claims”) of U.S. Patent No. 10,091,956 B2 (Ex. 1001, “the ’956 patent”). Paper 2 (“Pet.”). E. M. P.¹ Enterprises, Inc. (“Patent Owner”) filed a Preliminary Response. Paper 13 (“Prelim. Resp.”).² With our authorization, Petitioner filed a Preliminary Reply (Paper 15, “Reply”) and Patent Owner filed a Preliminary Sur-reply (Paper 16, “Sur-reply”).

We have authority to determine whether to institute *inter partes* review. *See* 35 U.S.C. § 314 (2018); 37 C.F.R. § 42.4(a) (2021). *Inter partes* review may not be instituted “unless . . . the information presented in the petition . . . 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.” 35 U.S.C. § 314(a). Upon consideration of the evidence and arguments in the record, we institute *inter partes review* of the ’956 patent on all challenges set forth in the Petition.

¹ According to Patent Owner’s most recent updated mandatory notices, all rights in the ’956 patent were recently assigned to E. M. P. Enterprises, Inc. and Patent Owner seeks a revision to our caption to reflect that change. Paper 14, 2. We have updated the caption to reflect the current patent ownership.

² We granted Patent Owner’s request for an extension of time to file its Preliminary Response for the reasons provided by Patent Owner during a conference call addressing the issue. *See* Ex. 1021, 12:2–18:2, 31:25–35:3, 37:24–38:17 (transcript of conference call); Ex. 3002 (February 11, 2022 email to the parties indicating that the Panel “granted Patent Owner’s request for an extension of time to file a Patent Owner Preliminary Response to March 4, 2022”).

BACKGROUND

A. Related Proceedings

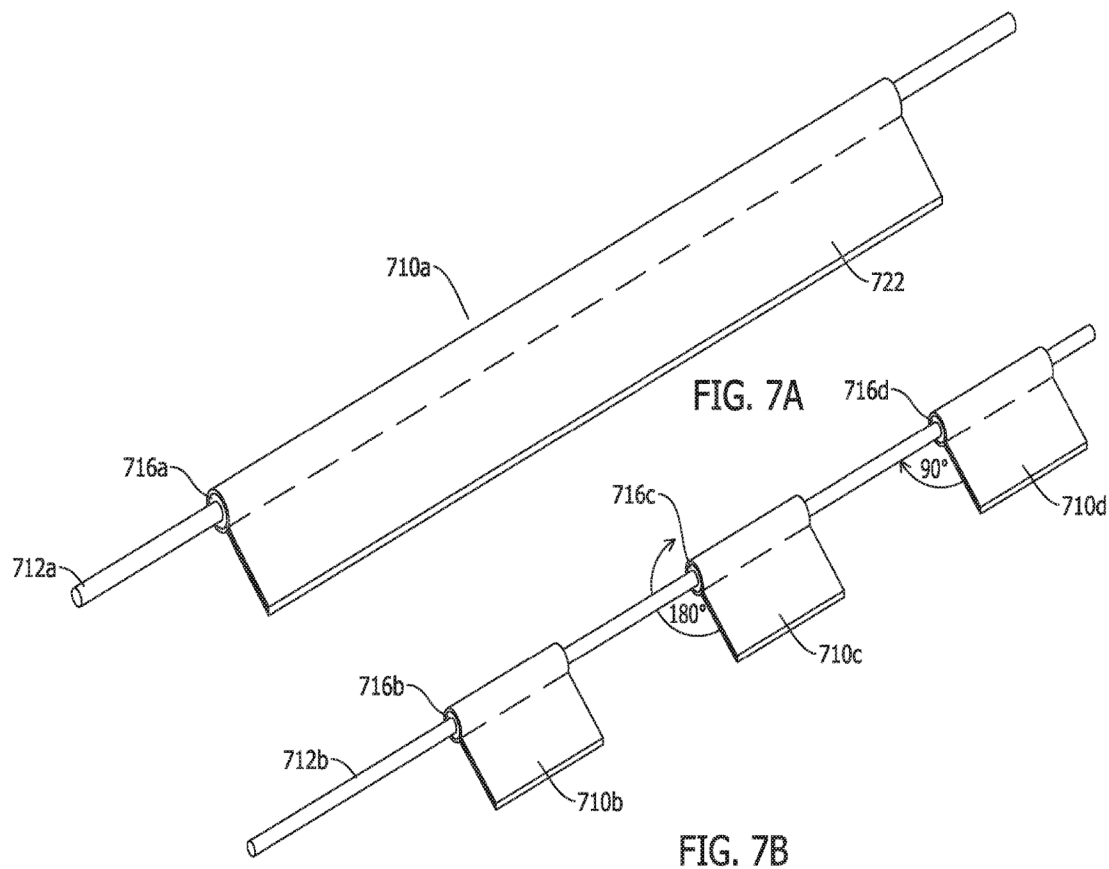
Patent Owner identifies IPR2021-01560 as a related matter involving a related patent. Paper 14 (Patent Owner's Updated Mandatory Notice) at 2.

B. The '956 Patent

The '956 patent relates “to subsurface irrigation systems for supplying fluids to the root region of plants.” Ex. 1001, 1:6–7. The '956 patent describes several problems with prior art irrigation systems, including the use of emitters that may become clogged with the roots of nearby plants. *Id.* at 2:1–9. To alleviate this issue, the '956 patent describes placement of tubes containing emitters within tunnels of irrigation sleeves. *Id.* at code (57).

The '956 patent discloses an irrigation sleeve 10 having lower layer 12 and upper layer 14 and tunnels 16 formed at folds 18, 19 between layers 12, 14. Ex. 1001, 4:48–49, 4:55–57. The '956 patent describes regions 22a, 22b, and 22c between folds 18, 19 and edges 20a through 20d of irrigation sleeve 10. *Id.* at 4:66–5:3. The '956 patent describes regions 22a, 22b, and 22c as joined together using the needling technique over their entire area. *Id.* at 5:8–11. According to the '956 patent, the needling technique causes the fibers of layers 12, 14 resting against each other to loop or felt with each other, largely eliminating the dividing line between layers 12, 14 and forming a single matrix as a result of the needling process. *Id.* at 5:17–22.

The '956 patent also discloses the use of multiple sleeves connected by tubing placed within the sleeves' tunnels. Ex. 1001, code (57). Figures 7A and 7B of the '956 patent are reproduced below.



Figures 7A and 7B show a subsurface irrigation system comprising a plurality of subsurface irrigation sleeves. Ex. 1001, 4:14–16. Figure 7A shows sleeve 710a constructed with tunnel 716a disposed on the side of sleeve 710a and tubing 712a within tunnel 716a to provide fluid to sleeve 710a. *Id.* at 8:26–29. Figure 7B shows a plurality of sleeves 710b, 710c, 710d that include respective tunnels 716b, 716c, 716d and tubing 712b extending through each tunnel. *Id.* at 8:34–40. The arrangement shown in Figure 7B allows the planes of the plurality of sleeves 710b, 710c, 710d to be oriented at different angles, depths, and distances from one another to accommodate different landscape designs. *Id.* at 8:35–38. Emitters on the tubing within the tunnels distribute fluid to sleeves without intrusion from roots due to the protection provided by the sleeve. *Id.* at 10:1–4. According

to the '956 patent, this system allows the use of conventional “drip lines” rather than specialized emitters used to prevent root intrusion. *Id.* at 10:4–12.

C. Challenged Claims

Petitioner challenges claims 1–18 (all claims) of the '956 patent, of which claims 1, 11, and 18 are independent. Independent claim 1 is reproduced below:

1. A subsurface irrigation system comprising:

a plurality of subsurface irrigation sleeves comprising a single-matrix area having a first side and a second side, at least one of the first side and the second side being configured to be hydrophilic, and comprising a tunnel at a fold in the first side and the second side where the first side and the second side are separated from one another to form the tunnel;

tubing connecting a first sleeve of the plurality of subsurface irrigation sleeves to a second sleeve of the plurality of subsurface irrigation sleeves, the tubing being configured to pass through the tunnels of the plurality of irrigation sleeves; and

an emitter being disposed on the tubing within the tunnel of each of the plurality of subsurface irrigation sleeves, the emitter emitting fluid to the single-matrix area of the plurality of subsurface irrigation sleeves,

wherein the at least one of the first side and the second side is comprised of extruded fibers having a plurality of projections extending from a longitudinal axis, the projections defining longitudinal channels along the fibers.

Ex. 1001, 12:25–46.

D. Asserted Grounds of Unpatentability

Petitioner challenges claims 1–18 on the following grounds (Pet. 3):

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–4, 6, 10–13, 17, 18	103	Haub, ³ Pourdeyhimi, ⁴ Lichfield ⁵
5, 14	103	Haub, Pourdeyhimi, Lichfield, Henry ⁶
7–9, 15, 16	103	Haub, Pourdeyhimi, Lichfield, Prescott ⁷
1–4, 6, 10–13, 17, 18	103	Durkheim, ⁸ Pourdeyhimi, Lichfield
5, 14	103	Durkheim, Pourdeyhimi, Lichfield, Henry
7–9, 15, 16	103	Durkheim, Pourdeyhimi, Lichfield, Prescott

Petitioner supports its challenges with declarations from Dr. Barry R. Christopher (Ex. 1018) and Dr. Hannah Mary Mathers (Ex. 1019).

ANALYSIS

A. Discretion Under 35 U.S.C. § 325(d)

Patent Owner argues that we should exercise discretion to deny institution under 35 U.S.C. § 325(d). *See* Prelim. Resp. 17–31; Sur-reply 3–7. Petitioner argues that we should not. *See* Pet. 51–53; Reply 3–10.

³ U.S. Pub. No. 2016/0088806, published Mar. 31, 2016 (“Haub,” Ex. 1014).

⁴ U.S. Pat. No. 8,129,019, issued Mar. 6, 2012 (“Pourdeyhimi,” Ex. 1008).

⁵ U.S. Pat. No. 5,938,372, issued Aug. 17, 1999 (“Lichfield,” Ex. 1004).

⁶ U.S. Pat. No. 6,152,653, issued Nov. 28, 2000 (“Henry,” Ex. 1005).

⁷ U.S. Pub. No. 2012/0279120, published Nov 8, 2012 (“Prescott,” Ex. 1010).

⁸ U.S. Pub. No. 2013/0292343, published Nov. 7, 2013 (“Durkheim,” Ex. 1013).

1. Legal Framework

Section 325(d) provides that, in determining whether to institute *inter partes* review, “the Director may take into account whether, and reject the petition or request because, the same or substantially the same prior art or arguments previously were presented to the Office.” The Board uses a two-part framework in determining whether to exercise its discretion under § 325(d): (1) determining whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office; and (2) if either condition of the first part of the framework is satisfied, determining whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims. *See Advanced Bionics, LLC v. Med-El Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 at 8 (PTAB Feb. 13, 2020) (precedential). In applying this framework, we consider several non-exclusive factors, including:

(a) the similarities and material differences between the asserted art and the prior art involved during examination; (b) the cumulative nature of the asserted art and the prior art evaluated during examination; (c) the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection; (d) the extent of the overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art; (e) whether Petitioner has pointed out sufficiently how the Examiner erred in its evaluation of the asserted prior art; and (f) the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments.

Becton, Dickinson & Co. v. B. Braun Melsungen AG, IPR2017-01586, Paper 8 at 17–18 (PTAB Dec. 15, 2017) (precedential as to Section III.C.5,

first paragraph). If, after review of factors (a), (b), and (d), we determine that the same or substantially the same art or arguments previously were presented to the Office, then factors (c), (e), and (f) relate to whether the petitioner demonstrates that the Office erred in a manner material to the patentability of the challenged claims. *Advanced Bionics*, Paper 6 at 10.

2. Discussion

As to the first part of the *Advanced Bionics* framework, Patent Owner contends, and Petitioner does not dispute, that each of Lichfield, Prescott, Pourdeyehimi, and Haub were before the Patent Office during prosecution of the application that led to the issuance of the '956 patent. Prelim. Resp. 20–21; Pet. 52–53. Patent Owner also argues that Durkheim and Henry are substantially the same as prior art already before the Examiner. Prelim. Resp. 21–24. As to Durkheim, Patent Owner contends that the teachings Petitioner relies upon are substantially the same as Haub, which was considered by the Examiner. *Id.* at 24. Patent Owner also relies on Petitioner's characterization of Durkheim and Haub as “comparable” as evidence that Haub renders Durkheim cumulative. *See id.*; *see also* Sur-reply 6–7.

Petitioner argues that Durkheim is not cumulative of the art applied by the Examiner during prosecution. Pet. 52–53. For example, Petitioner argues that Durkheim discloses the claimed “single-matrix area” that the primary reference relied upon by the Examiner did not disclose. *Id.* at 53.

Based on our review of the record and the parties' arguments, we determine that Durkheim was not substantially the same as, or cumulative of, any art before the Examiner. Patent Owner primarily relies on Petitioner's arguments that Durkheim and Haub are “comparable,” but that

statement does not amount to an admission that the presence of Haub before the Examiner renders Durkheim cumulative of Haub. *See* Prelim. Resp. 24; Sur-reply 6–7. In addition, the mere fact that Petitioner argues that the references disclose the same claim limitations does not render one reference cumulative of the other. *See* Prelim. Resp. 23–24. Durkheim may more clearly disclose one or more of those limitations, rendering it more relevant in some respect than Haub. The references do not share a common specification and include different figures, with Durkheim arguably providing a clearer cross section of its irrigation sleeve (shown in Figure 3) and holes in its tubes (the alleged emitters shown as perforations 231 in Figure 4) when compared to the related figures of Haub. *Compare* Ex. 1013, Figs. 3–4, with Ex. 1014, Figs. 1, 3.

Petitioner bases three challenges that encompass all challenged claims on combinations of prior art that rely heavily on Durkheim. Pet. 3. We conclude that Petitioner bases these challenges on prior art and arguments that are not the same or substantially the same as the prior art or arguments before the Examiner. When considering the Petition as a whole, we find that it does not sufficiently implicate the concerns addressed by § 325(d) to warrant discretionary denial. Because the first part of the framework in *Advanced Bionics* is not met, we need not reach “whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.” *Advanced Bionics*, Paper 6 at 8–9. Nevertheless, we conclude that Petitioner has shown sufficient error such that the second part of the *Advanced Bionics* framework is not met, for the reasons stated by Petitioner. *See* Pet. 52–53; Reply 4–10. For example, the Examiner did not apply Haub in any rejections, and should have appreciated, given that it

shared a portion of the same specification as the '956 patent, that Haub discloses the single matrix area of the irrigation sleeve and was more relevant than the references relied on by the Examiner in at least this respect. *See* Pet. 52; Reply 4–7. Because both parts of the *Advanced Bionics* framework are not met, we decline to exercise our discretion and deny institution pursuant to § 325(d).

B. The Level of Ordinary Skill in the Art

The level of ordinary skill in the art is “a prism or lens” through which we view the prior art and the claimed invention. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). The person of ordinary skill in the art is a hypothetical person presumed to have known the relevant art at the time of the invention. *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). In determining the level of ordinary skill in the art, we may consider certain factors, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *Id.*

Petitioner contends, with accompanying declaration testimony, that a person having ordinary skill in the art “would likely have had at least a Bachelor of Science (BSc) in Material Sciences, or a Master of Science (MSc) in Horticulture/Plant Science, or a BSc in Civil Engineering and practical experience in water management.” Pet. 20 (citing Ex. 1019, 2–3). Petitioner also asserts that a person having ordinary skill in the art “would have had at least general knowledge about plant stress physiology, soil science, subsurface irrigation tubing materials, emitter technologies, geotextile mats, irrigation mats, hydrophilic material properties, wicking

material properties, plant root systems, root zone factors that impact plant health, and irrigation installation and management.” *Id.*

Patent Owner does not dispute Petitioner’s proposed definition of the level of ordinary skill in the art, which appears consistent with the record at this stage of the proceeding, including the prior art. *See* Prelim. Resp. 7; *GPAC Inc.*, 57 F.3d at 1579. For purposes of this Decision, we adopt the definition of the level of ordinary skill in the art proposed by Petitioner.

C. Claim Construction

In *inter partes* reviews, the Board interprets claim language using the same claim construction standard that would be used in a civil action under 35 U.S.C. § 282(b), as described in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). *See* 37 C.F.R. § 42.100(b). Under that standard, we generally give claim terms their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art at the time of the invention, in light of the language of the claims, the specification, and the prosecution history. *See Phillips*, 415 F.3d at 1313–14. Although extrinsic evidence, when available, may also be useful when construing claim terms under this standard, extrinsic evidence should be considered in the context of the intrinsic evidence. *See id.* at 1317–19.

Petitioner proposes constructions for “single-matrix area,” “tunnel,” “fold,” and “emitter.” Pet. 8. Patent Owner does not address Petitioner’s first three proposed constructions, but takes issue with Petitioner’s proposed construction of “emitter” and proposes its own construction. Prelim. Resp. 7–10. The parties also provided additional briefing on the construction of “emitter.” *See* Reply 1–3; Sur-reply 1–3. Petitioner argues that we should construe emitter to mean “any hole, perforation, or pore in irrigation tubing

that can pass a fluid.” Pet. 8. Patent Owner views Petitioner’s construction as “overbroad” because emitters are “one-directional” and argues that we should construe emitter to mean “any hole, perforation, or pore that can give off or send out a fluid.” Prelim. Resp. 9–10.

For the reasons provided below, at this stage of the proceeding and based on the current record, we do not discern a need to construe explicitly any claim terms because doing so would not change the outcome of the analysis below. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (stating that “we need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

D. Challenges Based on Haub

Petitioner contends that claims 1–4, 6, 10–13, 17, and 18 would have been obvious over Haub, Pourdeyhimi, and Lichfield. Pet. 3, 27–33. This challenge encompasses independent claims 1, 11, and 18. *Id.* Patent Owner argues that Haub, Pourdeyhimi, and Lichfield all fail to disclose the claimed plurality of irrigation sleeves, and that the challenges based on Haub are not likely to succeed for that reason. Prelim. Resp. 35–36. We first provide an overview of the prior art and then address the parties’ arguments.

1. Overview of Haub

Haub is a published patent application (Ex. 1014) that eventually issued as U.S. Patent No. 10,085,391 B2 (“the ’391 patent”). *See* Ex. 1020. Patent Owner owns the ’391 patent, and Petitioner challenges that patent in related IPR2021-01560. Portions of Haub, including the description of the irrigation mat or sleeve, are substantially the same as the description of the

same structure in the '956 patent. *See* Ex. 1014, Figs. 1–2; Ex. 10201, Figs. 1–2.

Haub relates to “an irrigation mat for supplying fluids to the root region of plants.” Ex. 1014 ¶ 2. Haub describes prior art irrigation mats as including two layers bound together by seam-like connections, and including pockets for tubing between the layers. *Id.* ¶¶ 5–6. According to Haub, the seam-like connections used in the prior art can come loose, causing slippage between the two layers and complications when placing the mats. *Id.* ¶ 6. To alleviate these issues, Haub describes a “needling” technique that pierces the two layers together, and emphasizes needling over the entire area of the mat between the tubes alleviates these and other problems. *Id.* ¶¶ 13–15.

Figure 1 is reproduced below:

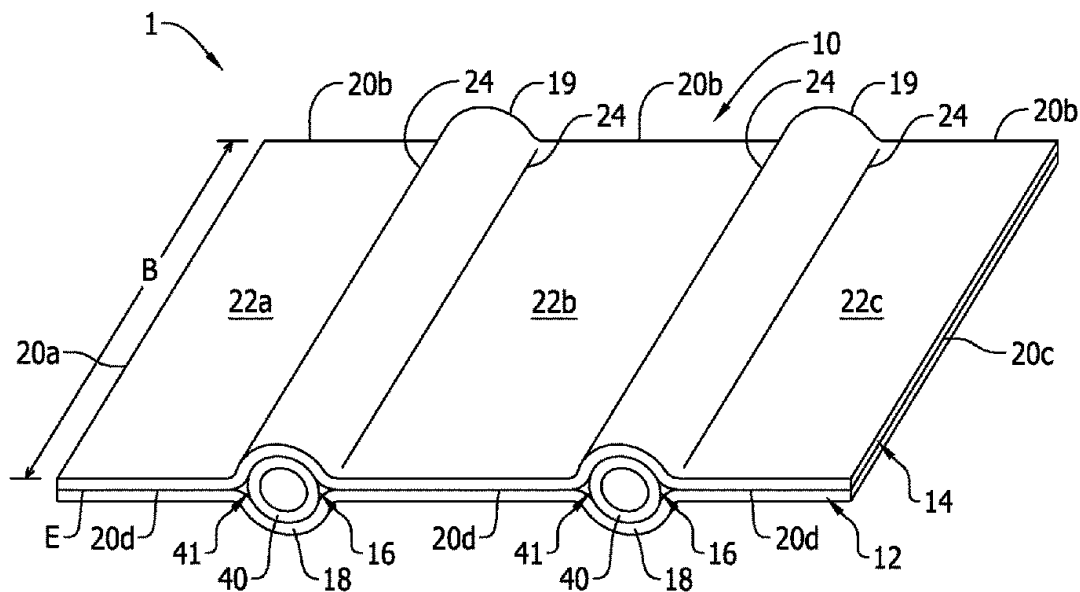


Figure 1 “shows an irrigation system with an irrigation mat equipped with two tubes.” Ex. 1014 ¶ 42. More specifically, Figure 1 depicts irrigation mat 10 having lower layer 12 and upper layer 14 and two tubes 40 disposed within two tunnels 16 formed at folds 18, 19 between layers 12, 14. *Id.*

¶¶ 50–51. Layers 12, 14 are composed of textile fabric, and Haub notes that if the two layers 12, 14 are “composed of an identical material” then the irrigation mat can “be laid so that the positions of the lower layer 12 and the upper layer 14 are reversed,” easing handling of the irrigation mat. *Id.*

¶¶ 18, 50, 52. Figure 1 also depicts regions 22a, 22b, and 22c between edges 24 of folds 18, 19 and edges 20a through 20d of the irrigation mat. *Id.* ¶ 54. Haub describes regions 22a, 22b, and 22c as joined together using the needling technique over their entire area. *Id.* ¶ 55. According to Haub, the needling technique causes the fibers of layers 12, 14 resting against each other to loop or felt with each other, largely eliminating the dividing line between layers 12, 14 and forming a single matrix as a result of the needling process. *Id.* ¶¶ 55–56. Haub also describes drip emitters 44 inside tube 40, with tube 40 “configured to convey various fluids, such as liquids and/or gasses, to facilitate irrigation.” *Id.* ¶ 58.

2. Overview of Lichfield

Lichfield discloses a subsurface irrigation apparatus that includes an underlayment of water resistant material that serves as a mounting surface for the remaining elements of the subsurface irrigation apparatus. Ex. 1004, code (57). Lichfield’s Figures 1 and 2 are reproduced below.

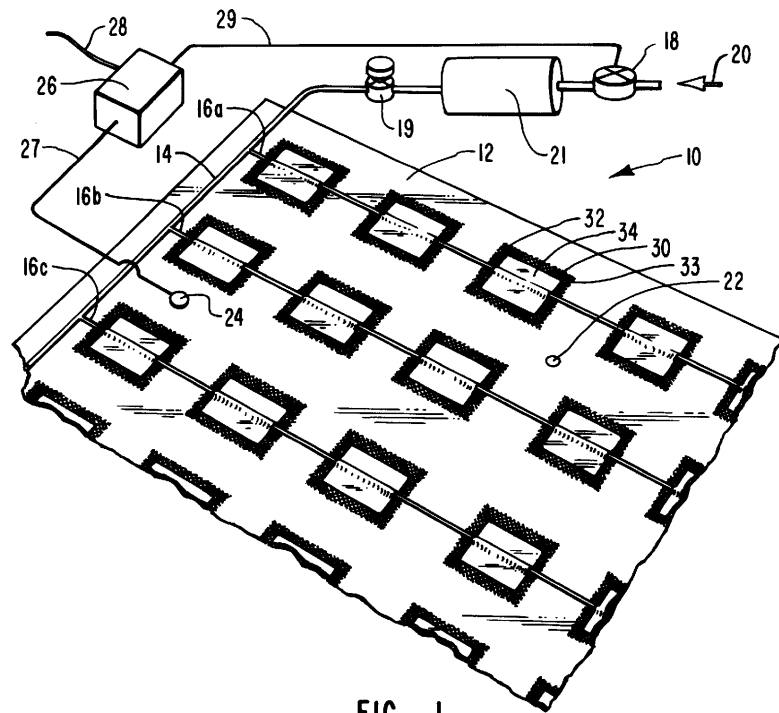


FIG. 1

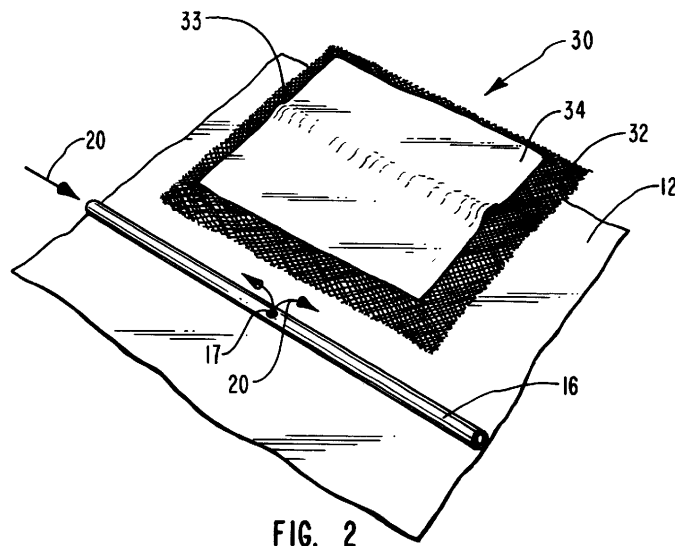


FIG. 2

Figure 1 shows is a perspective view of Lichfield's subsurface irrigation apparatus and Figure 2 shows a fragmentary, exploded perspective view of diffuser 30. Ex. 1004, 4:22–25. Figure 1 depicts underlayment 12 having supply conduit 14 and a plurality of distribution conduits 16a–16c coupled to conduit 14. *Id.* at 5:38–43. Figures 1 and 2 both show diffusers 30 that include diffusion layer 32 and overlayment 34. *Id.* at 5:53–57. In use, fluid

flows through conduit 16, exits hole 17 in conduit 16 in the area of diffusion layer 32, and diffusion layer 32 distributes the fluid in a horizontal, 360 degree direction. *Id.* at 6:31–39.

3. *Overview of Pourdeyhimi*

Pourdeyhimi discloses a “high surface area fiber” having “a middle region with a plurality of projections that define a plurality of channels, which increases the surface area of the fiber.” Ex. 1008, code (57).

Pourdeyhimi seeks to address problems with round prior art fibers that have limited surface area and the inability to increase surface area without an undesired increase in diameter of the fibers. *Id.* at 2:9–21. To achieve this goal, Pourdeyhimi discloses internal fiber 12 having longitudinal axis 17 with a plurality of projections 18 that extend from longitudinal axis 17. *Id.* at 4:12–19. According to Pourdeyhimi “projections 18 increase the surface areas and surface capillaries for a single fiber” and define a plurality of channels 20 that “create a surface capillary portion along the length of the fiber 10 that facilitates the absorption of liquids within the fiber 10.” *Id.* at 4:23–30.

4. *Discussion of Independent Claims 1, 11, and 18*

Petitioner contends that Lichfield discloses the claimed plurality of sleeves and tubing connecting the sleeves, while Haub discloses the claimed “single-matrix area,” tunnels, tubing configured to pass through the tunnels, and an emitter on the tubing that emits fluid to the single-matrix area. Pet. 27–33. Petitioner contends that Pourdeyhimi discloses the claimed “extruded fibers having a plurality of projections extending from a longitudinal axis, the projections defining longitudinal channels along the fibers.” *Id.* As to the plurality of sleeves limitation, Petitioner relies on

Lichfield's diffusers 30 and Figures 1 and 2 of Lichfield, reproduced above. *See id.* at 27 (citing Ex. 1004, Figs. 1 and 2, 5:53–61). As to the combination of Haub and Lichfield, Petitioner argues that “Lichfield discloses serial connection of multiple subsurface irrigation sleeves (diffusers (30)) via tubing 16 (16a, 16b, 16c)” and Haub discloses a comparable sleeve. Pet. 23 (citing Ex. 1004, Fig. 1). Petitioner further argues that “[s]erial connection of irrigation components is a widely-known technique . . . in the context of above-ground or surface-level sprinkler heads” and that one of ordinary skill in the art “would have appreciated the need for separate sub-surface irrigation sleeves under certain circumstances, for example to irrigate target areas that are divided by man-made or natural barriers, or are otherwise geographically separated.” *Id.* (citing Ex. 1019, 7). As to the combination with Pourdeyhim, Petitioner argues that the prior art provides explicit motivations “to use the Pourdeyhim fiber” in Haub’s sleeve and that one of ordinary skill in the art would have a reasonable expectation of success in making the combination. *Id.* at 22.

Patent Owner argues that none of the art, including Lichfield, discloses the claimed plurality of sleeves, and therefore none of the art discloses tubing connecting a plurality of sleeves. Prelim. Resp. 34–35. More specifically, Patent Owner contends that Lichfield’s diffusers 30 only disclose one layer of a sleeve and Lichfield’s underlayment 12 provides the other layer of the sleeve. *Id.* (citing Ex. 1001, 12:27, 33–37). According to Patent Owner, because Lichfield provides a tunnel for its tubing between “between first side 12 and second side 30” of its sleeve, and the ’956 patent describes the fold for the tunnels as disposed between the layers of the sleeve, Lichfield’s sleeve comprises underlayment 12 and diffuser 30 rather

than the layers 32, 34 of diffuser 30. *Id.* Based on this interpretation of Lichfield, Patent Owner contends that Lichfield does not disclose more than one sleeve because underlayment 12 extends under all diffusers 30. *Id.* at 35.

Based on our review of the current record, Petitioner establishes adequately that Lichfield discloses the claimed plurality of sleeves. Petitioner relies on diffusers 30 shown in Figures 1 and 2 and the accompanying text describing the layers of the diffuser. *See* Pet. 27 (citing Ex. 1004, Figs. 1 and 2, 5:53–61). Petitioner’s arguments, based on the current record, establish that diffusers 30 include layers 32, 34 that form a sleeve and that Lichfield discloses multiple diffusers 30 or sleeves. Ex. 1004, Figs. 1 and 2, 5:53–61. Patent Owner relies heavily on the location of Lichfield’s tunnels to support its argument that underlayment 2 must form one layer of the claimed sleeve, but Petitioner relies on Haub, not Lichfield, as disclosing the claimed tunnels. Pet. 28. Petitioner further relies on Haub’s tubing as configured to be placed in the tunnels formed by Haub’s sleeve, not within any tunnels in Lichfield. *See id.* (“Haub discloses tubing (40) being configured to pass through the tunnels (16) of the irrigation sleeve (mat 10). Ex. 1014, Figs. 1 and 5; Paras [0050], [0051], and [0053].”). Petitioner only relies on Lichfield for multiple sleeves and tubing connecting multiple sleeves, not the location of tunnels within the sleeve or the placement of tubing within the tunnels. *See id.* We find Patent Owner’s effort to redefine Lichfield’s underlayment 12 as one layer of the sleeve unpersuasive based on this record. Further, even if Patent Owner correctly asserts that Lichfield’s underlayment 12 forms one layer of the sleeve, Patent Owner does not point to claim language that would prevent Petitioner

from relying on the area between each diffuser 30 and underlayment 12 as distinct sleeves. Accordingly, based on the current record, Patent Owner's arguments do not undermine Petitioner's showing that Lichfield discloses a plurality of sleeves and tubing connecting those sleeves.

We have reviewed Petitioner's arguments and evidence as to the remaining limitations of independent claims 1, 11, and 18 and determine, based on the current record, that Petitioner establishes sufficiently that the combination of Haub, Pourdeyhimi, and Lichfield discloses all of the limitations of claims 1, 11, and 18. *See* Pet. 27–33. We have also reviewed Petitioner's reasons to combine the references and determine that Petitioner establishes sufficiently, based on the current record, that one of ordinary skill in the art would have been motivated to combine Haub, Pourdeyhimi, and Lichfield for the reasons provided by Petitioner. *See id.* at 21–26. Based on the foregoing, Petitioner establishes a reasonable likelihood of success in establishing that independent claims 1, 11, and 18 would have been obvious based on Haub, Pourdeyhimi, and Lichfield.

5. *Remaining Challenges*

Petitioner contends that dependent claims 2–4, 6, 10, 12, 13, and 17 would have been obvious over Haub, Pourdeyhimi, and Lichfield, dependent claims 5 and 14 would have been obvious over Haub, Pourdeyhimi, Lichfield, and Henry, and dependent claims 7–9, 15, and 16 would have been obvious over Haub, Pourdeyhimi, Lichfield, and Prescott. Pet. 3. Patent Owner does not address these challenges beyond the arguments we addressed above in the context of the independent claims. *See* Prelim. Resp. 34–35. Because we institute *inter partes* review as to the independent

claims, we also institute *inter partes* review as to these dependent claims. *See SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018).

E. Challenges Based on Durkheim

Petitioner contends that claims 1–4, 6, 10–13, 17, and 18 would have been obvious over Durkheim, Pourdeyhim, and Lichfield. Pet. 3, 34–42. This challenge encompasses independent claims 1, 11, and 18. *Id.* Petitioner also argues that dependent claims 5 and 14 would have been obvious over Durkheim, Pourdeyhim, Lichfield, and Henry, and dependent claims 7–9, 15, and 16 would have been obvious over Durkheim, Pourdeyhim, Lichfield, and Prescott. Pet. 3. Because we institute *inter partes* review as to the independent claims based on the challenges including Haub, we also institute *inter partes* review as to the challenges based on Durkheim. *See SAS Inst.*, 138 S. Ct. at 1359–60. We provide a brief analysis of the parties’ arguments as to these challenges to provide guidance during the trial.

1. Overview of Durkheim

Durkheim discloses a system and method for collecting chemical compounds from soils. Ex. 1013, codes (54), (57), ¶ 1. Durkheim’s Figure 3 is reproduced below.

Figure 3

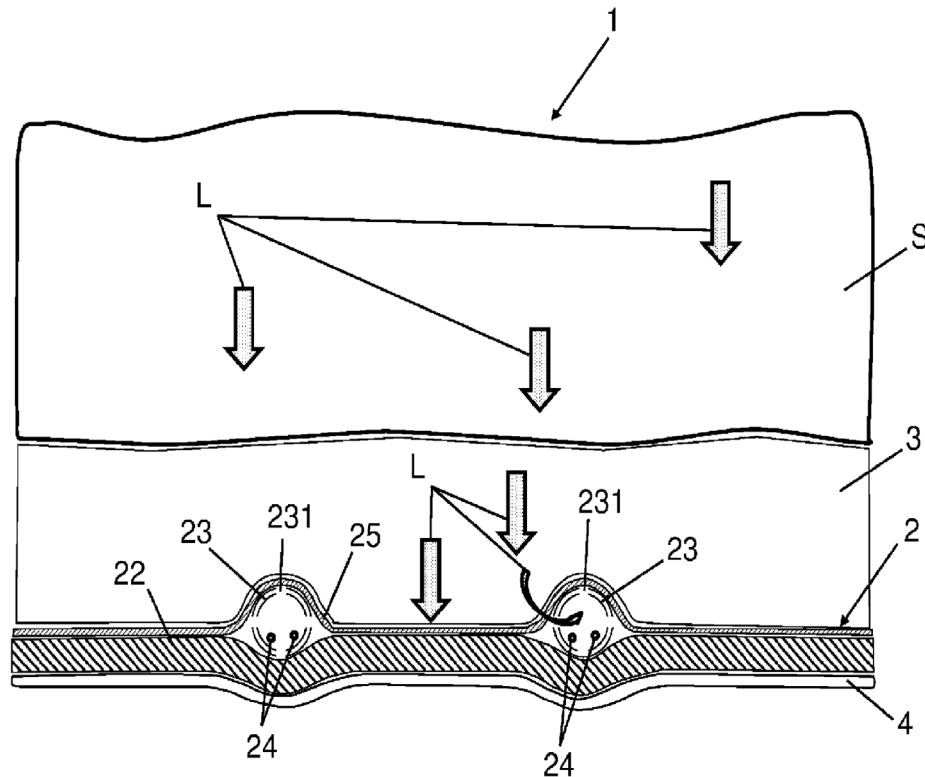


Figure 3 depicts “a sectional view of part of a geocomposite, covered by a granulate and aggregates.” Ex. 1013 ¶ 33. Figure 3 shows liquid L passing through aggregates S toward geocomposite 2. *Id.* ¶ 39. Geocomposite 2 includes filtering layer 25 and draining layer 22. *Id.* ¶¶ 39, 46. Perforated mini-drains 23 located between filtering layer 25 and draining layer 22 collect chemical-laden fluids. *Id.* ¶¶ 39, 45. Each mini-drain 23 includes at least one fixing filament wire 24 that includes a chemical compound, such that chemicals in the fluid passing the wire fix or attach to wire 24. *Id.* ¶ 39. Durkheim states that the filtration opening of filtering layer 25 and/or the drainage opening of draining layer 22 controls the speed of fluid through geocomposite 2, with the speed chosen based on the speed of fixing the chemical compounds to wire 24. *Id.* ¶¶ 49–50.

2. Discussion

Petitioner's challenges based on Durkheim are similar to those based on Haub, with Petitioner relying on Durkheim as disclosing the same limitations as Haub. *See* Pet. 34–42. Petitioner relies on Lichfield and Pourdeyhim in a similar manner as well. *See id.*

Patent Owner raises several arguments against the challenges based on Durkheim. First, Patent Owner argues that Lichfield fails to disclose a plurality of sleeves, and we find that argument unpersuasive based on the current record for the reasons provided above. *See* Prelim. Resp. 36.

Second, Patent Owner argues that Petitioner relies on an impermissibly broad construction of “emitter” that encompasses the perforations 231 in Durkheim's mini-drains 23. Prelim. Resp. 36. Petitioner argues that we should construe emitter to mean “any hole, perforation, or pore in irrigation tubing that can pass a fluid.” Pet. 8. Patent Owner views Petitioner's construction as “overbroad” because emitters are “one-directional” and argues that we should construe emitter to mean “any hole, perforation, or pore that can give off or send out a fluid.” Prelim. Resp. 9–10. Patent Owner relies on its claim construction argument to support its argument that Durkheim does not disclose emitters because Durkheim's chemical collection system employs perforations 231 on its mini-drains 23 to absorb fluid rather than emit fluid. *See id.* at 36. While Petitioner relies on its construction when it argues that Durkheim alone discloses an emitter, Petitioner also argues as part of its obviousness challenge that “[i]t was common knowledge that the disclosed structure (geocomposite (2)) in Durkheim could be used for irrigation rather than drainage.” Pet. 36 (citing Ex. 1018, 5–6). In other words, Petitioner contends that when one of

ordinary skill in the art realizes that Durkheim's irrigation mat may be used for irrigation rather than drainage, Durkheim's perforations would be used to emit fluids, consistent with Patent Owner's more narrow construction of "emitter." *Id.* We have reviewed Petitioner's arguments in support of using Durkheim for irrigation, and based on the current record, we determine that Petitioner establishes adequately that one of ordinary skill in the art would have known that drainage mats such as Durkheim could also be used for irrigation. *See* Pet. 36; Ex. 1018, 5–6. We therefore need to determine whether Durkheim standing alone, based on Petitioner's proposed claim construction, discloses an emitter. The parties may further address this issue during trial.

Patent Owner raises additional arguments against the combination of Durkheim's drainage system with the irrigation systems the other prior art discloses. *See* Prelim. Resp. 36–40. These arguments raise issues of fact that are best resolved after review of a full record developed during trial. Based on our preliminary analysis and the current record, Petitioner establishes sufficiently, with support from its declarants, that one of ordinary skill in the art would have been motivated to combine the references in the manner Petitioner proposes. *See* Pet. 21–26. We have not made a final determination on any of these issues, and we will do so only after review of a complete record, including any competing testimony from one of ordinary skill in the art that may be introduced by Patent Owner.

CONCLUSION

After considering the evidence and arguments, we determine that the information presented shows a reasonable likelihood that Petitioner would

prevail in establishing that at least one of the challenged claims of the '956 patent is unpatentable on grounds asserted in the Petition.

ORDER

Accordingly, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review is instituted for claims 1–18 of the '956 patent on the unpatentability grounds asserted in the Petition; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) 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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