NOTE: This disposition is nonprecedential.

United States Court of Appeals for the Federal Circuit

KIRSCH RESEARCH AND DEVELOPMENT, LLC,
Appellant

v.

GAF MATERIALS LLC,
Appellee

2022-2063

Appeal from the United States Patent and Trademark Office, Patent Trial and Appeal Board in No. IPR2021-00192.

Decided: May 2, 2024

AMY HAYDEN, Russ August & Kabat, Los Angeles, CA, argued for appellant. Also represented by MARC A. FENSTER, JONATHAN MA, BENJAMIN T. WANG.

JOHN NEUKOM, Debevoise & Plimpton LLP, San Francisco, CA, argued for appellee. Also represented by EDWARD TULIN, Gish PLLC, New York, NY.

Before PROST, BRYSON, and STARK, *Circuit Judges*.

STARK, *Circuit Judge*.

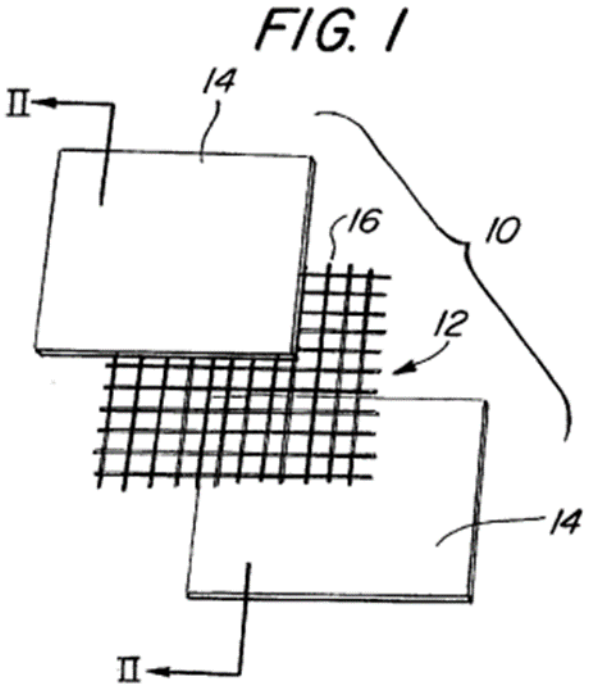
Patent owner Kirsch Research and Development, LLC ("Kirsch") appeals a final written decision of the U.S. Patent Trial and Appeal Board ("Board") in an *inter partes* review ("IPR") that found all claims of its U.S. Patent No. 6,308,482 ("'482 patent") unpatentable over prior art. We affirm.

I

Kirsch's '482 patent, "Reinforced Roof Underlayment and Method of Making the Same," "relates generally to a weather-resistive barrier for a roofing structure, and specifically to a reinforced roof underlayment having an improved strength and durability to provide a waterproof layer resistive to deterioration from external elements." '482 patent 1:13-17. The patent describes a reinforced "roofing underlayment . . . positioned between a roof support structure and an overlayment" (e.g., shingles). *Id.* at 2:46-48. The underlayment has "an interwoven scrim with at least one layer of waterproof material affixed thereto," where "[t]he scrim comprises a mesh of interwoven strands of thermoplastic having a tensile strength sufficient to resist tearing." *Id.* at 2:36-39.

In an exemplary embodiment of the underlayment, two "layers of waterproof material 14 [are] affixed to both sides

of the reinforcing scrim 12," as shown in Figure 1, reproduced below. *Id.* at 3:63-64.



The layer of "waterproof material 14 is preferably a layer of thermoplastic film which is extruded over each side of the scrim 12, so that the reinforcing scrim 12 is sandwiched between the two thermoplastic layers 14." *Id.* at 3:67-4:3. The specification describes this sandwiching arrangement as the preferred embodiment, *id.* at 3:66-4:5, but also notes that "certain applications may allow the reinforcing scrim 12 to have only one of its sides coated with a thermoplastic layer 14." *Id.* at 4:6-8. Furthermore, while the underlayment "is preferably formed by co-extruding layers of thermoplastic film 14 over the reinforcing scrim 12, . . . it is understood that the thermoplastic layers 14 may be affixed to the reinforcing scrim 12 using an adhesive or any other manner of attachment." *Id.* at 4:10-15.

As illustrated in Figure 3, reproduced below, the underlayment may also include additional layers, including "a slip-resistant surface 30" that "prevent[s] a person from slipping" and a "radiant barrier layer 32 preferably compris[ing] a metalized layer" that "reflect[s] solar energy." *Id.* at 4:24-38.

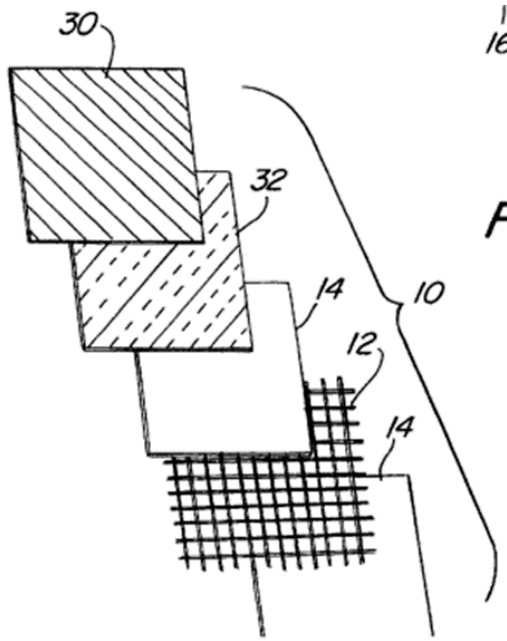


FIG. 3

Representative claim 1 recites:

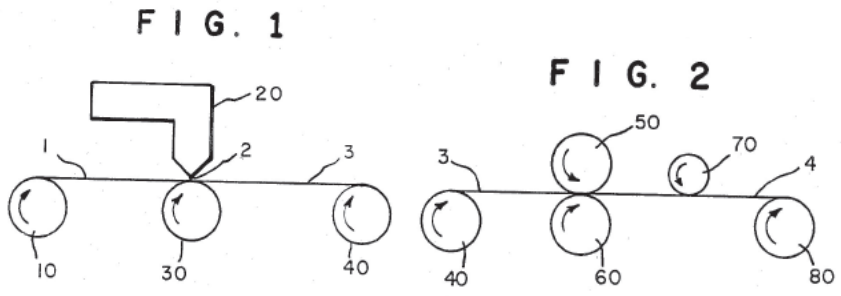
1. A roofing underlayment positioned between a roof support structure and an overlayment, comprising:

    a reinforcing scrim of interwoven strands for supporting tensile forces in multiple directions; and

    at least one layer of thermoplastic material *affixed to a side of the reinforcing scrim by extrusion lamination* for providing a weather-resistant barrier.

Id. at 7:21-27 (emphasis added).

GAF Materials LLC ("GAF") petitioned for IPR of all claims of the '482 patent based on several prior art references including, as relevant here, U.S. Patent No. 4,684,568 to Lou ("Lou"). Lou describes "a process for making a coated fabric that would be suitable for use . . . as a roofing-tile underlayment." J.A. 5193 at 1:37-40. This process "includes the steps of applying a continuous coating of polypropylene to a surface of a vapor-and-liquid-permeable, base sheet of synthetic organic fibers and then calendering [i.e., using rollers to flatten] the coated surface." *Id.* at 1:46-49. Lou further provides that "[a]lthough the coating and calendering steps are depicted as separate operations in the drawing, the steps can be performed as a continuous process." *Id.* at 2:50-52. The coating and calendering steps are illustrated in Lou's Figures 1 and 2, respectively, reproduced below:



J.A. 5192.

In its petition, GAF argued that the '482 patent's "affixed . . . by extrusion lamination" limitation was a product-by-process claim element that "would not have been expected to impart any distinctive structural or functional characteristics to the final underlayment product." J.A. 1030. Hence, in GAF's view, the challenged claims of the '482 patent could be found anticipated even if no prior art disclosed the claimed process. GAF's petition further

argued that "Lou also discloses the process step of affixing the thermoplastic material by extrusion lamination" by describing an extruder depositing "a thin continuous coating [of polypropylene polymer] on the surface of sheet 1," which is then "pressed by a calendaring nip formed by heated roll 50 and unheated backup roll 60." J.A. 1031.

Kirsch, in its patent owner response, argued against GAF's product-by-process interpretation of claim 1, contending that "extrusion lamination is not a process limitation because a product made by extrusion lamination exhibits particular structural features, such as superior bonding of the layers." J.A. 1217. Kirsch further pointed to a claim construction order issued in the Eastern District of Texas, which found that "extrusion lamination" was not a product-by-process limitation. *See* J.A. 1219; *see also* J.A. 6763-64.

Over the course of the IPR proceedings, and particularly after the Board in its institution decision advised the parties that "certain of Patent Owner's arguments . . . appear to present a potentially closely related issue of claim construction," J.A. 1162, the parties' dispute over the scope of the "affixed . . . by extrusion lamination" limitation evolved. The issue was thoroughly briefed, including in several responses, replies, and expert reports filed by each party, and was argued during the oral hearing before the Board.

In its final written decision, the Board found that the parties' dispute over the proper interpretation of the "extrusion lamination" limitation "present[ed] an implied issue of claim construction" which it must resolve. J.A. 12. To do so, the Board first rejected GAF's contention that the "extrusion lamination" limitation is a product-by-process claim element, noting that this conclusion was "consistent with the claim construction orders entered by the U.S. District Court" in litigation involving the '482 patent. J.A. 20. Because GAF has not challenged on appeal the Board's

decision not to construe the term as a product-by-process limitation, it is undisputed before us that the "extrusion lamination" term is *not* a product-by-process limitation.

The Board then addressed what it understood to be the parties' competing proposed constructions. Kirsch contended that the extrusion lamination limitation of claim 1 requires an extruded molten polymer (i.e., the claimed thermoplastic material) to "join (referred to in the art as 'laminating') different structures together." J.A. 16. Therefore, according to Kirsch, claim 1 requires at least three distinct layers: the scrim, the thermoplastic material, and a third layer joined to the scrim by the thermoplastic material. Kirsch frequently refers to this third layer as either the "slip-resistant layer" or "metallized layer" (i.e., the radiation barrier layer) described in the specification. *See* J.A. 16 ("[T]he polymer melt is used to laminate the reinforcing scrim with a top layer . . . such as a slip-resistant material . . . or a metallized layer."). GAF countered that only two layers are necessary – the scrim and the thermoplastic material – because the thermoplastic material itself is both a layer and a binder. *See* J.A. 18 ("[T]he experts agree on how extrusion lamination is defined in terms of requiring . . . binding that extrudate/polymer melt to at least a substrate/other layer.") (internal quotation marks omitted).

Understanding that the parties principally disputed whether the "extrusion lamination" term of claim 1 would read on a two-layer product, as GAF argued, or would only cover products containing three or more layers, which was Kirsch's contention, the Board sided with GAF. Reviewing both the intrinsic and extrinsic evidence, the Board rejected Kirsch's argument "that the recitation in claim 1 of 'extrusion lamination' requires that the recited roofing underlayment must include an additional layer besides the scrim and the thermoplastic material." J.A. 20. The Board further reasoned that while "claim 1 does not exclude the presence of additional layers in the roofing underlayment[,]

. . . we find nothing in the language of the claims or in the specification of the '482 patent that *requires* claim 1 to include such additional layer." *Id.* (emphasis in original). According to the Board, a two-layer product was also consistent with the addition of the "extrusion lamination" limitation during prosecution because it "specifies *how* the recited thermoplastic material must be affixed . . . but does not alter the recited function of the thermoplastic material." J.A. 22 (internal quotation marks omitted; emphasis in original). Lastly, the Board credited GAF's expert, Mr. Kaczkowski, who opined that extrusion coating would be considered by a person of ordinary skill in the art as being a type of extrusion lamination "if, for example, it results in the extrudate being permanently bonded to the substrate." J.A. 23 (internal quotation marks omitted). On this basis, the Board disagreed with Kirsch's insistence that extrusion coating and extrusion lamination are mutually exclusive processes. *Id.*

Applying its interpretation of the "extrusion lamination" limitation, as permitting a two-layer embodiment and not being mutually exclusive from extrusion coating, the Board found that all claims of the '482 patent were either anticipated by Lou or obvious over combinations that included Lou. Specifically, the Board found that Lou disclosed the "affixed . . . by extrusion lamination" limitation because "Lou's method extrudes molten polymer[,] . . . uses pressure, not merely a coating process, and expressly provides that the coating and calendering steps can be performed as a continuous process." J.A. 38. In the Board's view, by describing a process of extruding polymer onto a sheet and applying heat and pressure, Lou disclosed embodiments "substantially the same as embodiments described in the specification of the '482 patent" and, hence, satisfied the proper construction of "extrusion lamination." *Id.*

Kirsch timely appealed. We have jurisdiction under 28 U.S.C. § 1295(a)(4)(A).

II

Kirsch raises three issues on appeal. First, Kirsch argues that the Board committed procedural error by resolving a claim construction dispute without providing Kirsch adequate notice and an opportunity to be heard. Second, Kirsch challenges the Board's construction of the "affixed . . . by extrusion lamination" claim term. Finally, Kirsch contends that the Board's finding that the '482 patents are anticipated by Lou is not supported by substantial evidence. We address, and reject, each of Kirsch's arguments in turn.

A

Kirsch argues that the Board abused its discretion by construing the "extrusion lamination" limitation despite not being expressly asked to do so in GAF's petition. We disagree. IPR proceedings are governed by the Administrative Procedure Act ("APA"), 5 U.S.C. § 551 *et seq*. Under the APA, we must "hold unlawful and set aside agency action, findings, and conclusions found to be . . . arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law," made "without observance of procedure required by law," or "unsupported by substantial evidence." 5 U.S.C. § 706(2). An IPR petitioner is required to identify in its petition any claim term for which it proposes a construction. *See* 35 U.S.C. § 312; 37 C.F.R. § 42.104(b)(3). GAF acknowledges that it did not explicitly argue in its petition for construction of the "extrusion lamination" term. This is not dispositive of the parties' dispute, however.

Instead, as Kirsch acknowledges, *see* Appellant Br. at 41, under certain circumstances "the Board may adopt a claim construction of a disputed term that neither party proposes without running afoul of the APA." *Qualcomm Inc. v. Intel Corp.*, 6 F.4th 1256, 1262 (Fed. Cir. 2021). In particular, the Board is permitted to adopt a claim construction when both parties "dispute[] the meaning and

scope of [a limitation] during the IPR proceeding," even if no party expressly requests construction. *Google LLC v. EcoFactor, Inc.*, 92 F.4th 1049, 1057 (Fed. Cir. 2024). As long as the parties are "afforded both notice and opportunity to address" the proper interpretation of such a disputed claim term, the Board's construction does not violate the APA. *See id.*

Here, it was clear from GAF's petition and Kirsch's response that the parties had a dispute over the proper construction of the "extrusion lamination" term. And Kirsch was provided ample notice of and opportunity to address the issue of the term's proper construction. In addition to the parties debating the proper interpretation of the term in their regular briefing (i.e., petition, patent owner response, reply) and at the oral hearing, the Board additionally permitted each party to submit an extra brief specifically addressing the proper construction of extrusion lamination. This was consistent with the notice the Board provided the parties at least as early as the institution decision, when it observed that "certain of [Kirsch's] arguments . . . appear to present a potentially closely related issue of claim construction, underdeveloped on the present record, with respect to the term 'extrusion lamination.'" J.A. 1162. The Board therefore advised that "[t]he parties should address this term, in accordance with our Rules, during trial to the extent they believe it necessary." *Id.*

Kirsch's suggestion that it was surprised by the Board's treatment of the claim construction dispute is unpersuasive. Kirsch itself had flagged the claim construction issue in its patent owner response, writing: "Although [GAF] and [its expert] Mr. Kaczkowski do not offer any claim constructions in this IPR, it is clear that both have a different definition of 'extrusion lamination' than how a POSITA would understand the term." J.A. 1225-26. Consistent with Kirsch's statement notifying the Board that it had a claim construction dispute before it, Kirsch's counsel explicitly told the Board at oral hearing that the "extrusion

lamination" term "needs to be construed," adding that Kirsch "took the position in our papers that it should be construed as the plain and ordinary meaning which . . . requires multiple layers." J.A. 1588 at 33:13-16. Plainly, again, Kirsch had notice and an opportunity to be heard on the claim construction dispute.

Kirsch raises one additional procedural objection. It argues that the Board failed to include a "pressing" requirement in its construction of the "extrusion lamination" term. Kirsch contends that both parties agreed that the proper construction of "extrusion lamination" includes a "pressing" requirement (e.g., extruding the thermoplastic material onto the scrim and pressing them together to bind them), yet the Board omitted it without explanation. We perceive no error. Instead, we understand the Board's construction as implicitly including a pressing requirement. This seems evident from, for example, the Board's recognition that both parties' experts agreed "extrusion lamination" includes "extrusion coating" that results in a permanent bonding of "extrudate/polymer melt to at least a substrate/other layer," when such permanence is accomplished "through at least the act of pressing." J.A. 18. When the Board credited one of these experts to later conclude that "extrusion coating" is a type of "extrusion lamination" when it "results in the extrudate being permanently bonded to the substrate," J.A. 23, the Board also embraced the expert's agreed-upon pressure requirement. That the Board understood its construction to include a pressure requirement is further confirmed by its subsequent conclusion that Lou, which teaches extrusion and pressing (referred to in Lou as calendering), anticipates the challenged claims. J.A. 26.

B

We next consider whether the Board properly construed the disputed claim term. We conclude that it did.

We review the Board's claim construction de novo and any subsidiary factual findings based on extrinsic evidence for substantial evidence. *See Google*, 92 F.4th at 1054. Claim terms are generally given their plain and ordinary meaning, which is the meaning understood by one of ordinary skill in the art when read in the context of the claims, specification, and prosecution history. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1313-14 (Fed. Cir. 2005) (en banc). Substantial evidence is "such relevant evidence as a reasonable mind might accept as adequate to support a conclusion." *Consol. Edison Co. of N.Y. v. N.L.R.B.*, 305 U.S. 197, 229 (1938).

Addressing the parties' disputes, the Board construed "at least one layer of thermoplastic material affixed to a side of the reinforcing scrim by *extrusion lamination*" (emphasis added) as (i) requiring only two layers (a scrim and a thermoplastic material) while permitting a third or additional layers, and (ii) not being mutually exclusive from "extrusion coating." We agree with the Board that both the intrinsic and extrinsic evidence support its construction.

The plain language of claim 1 is sufficiently broad to encompass embodiments that contain only two layers – a scrim and thermoplastic material – and does not require a third layer (e.g., a slip-resistant layer or radiant barrier layer) joined to the scrim. Claim 1 is a "comprising" claim that recites the following necessary structures: "a reinforcing scrim . . . and *at least one layer* of thermoplastic material affixed to *a* side of the reinforcing scrim by extrusion lamination for providing a weather-resistant barrier." '482 patent 6:23-27 (emphasis added). Clearly, this language requires at least a reinforcing scrim layer and at least one layer of thermoplastic material; equally clearly, this language permits additional layers of thermoplastic material

and, being a comprising claim, additional layers generally. But no language in claim 1 *requires* any such additional layers.

The specification, which never uses the terms "extrusion lamination" or "extrusion coating," is largely unhelpful in arriving at the proper construction of "extrusion lamination." The specification describes only multilayer embodiments, but not in a manner that excludes a two-layer embodiment.[1] At least some of these multilayer embodiments contain third (and more) layers that are expressly claimed in claims depending from claim 1. *See, e.g.*, *id.* at 6:28-35 (claim 2 adding "a layer of slip-resistant material" and claim 4 adding "a radiant barrier layer"); J.A. 1229 (Kirsch's patent owner preliminary response arguing that "the polymer melt is used to laminate the reinforcing scrim with . . . a slip-resistant material . . . or a metallized layer [i.e., radiant barrier layer]"); *see also Philips*, 415 F.3d at 1315 ("[T]he presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim.").

As the Board observed, if we adopted Kirsch's proposed construction, which would *require* claim 1 to include one or more of these types of third layers, claims 2 and 4 "would make little sense." J.A. 21.

Next, we consider the prosecution history. Claim 1 as originally proposed did not include the "extrusion lamination" language. *See* J.A. 5033 at 11:3-8. During

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[1] During oral argument, GAF's counsel conceded that all figures in the specification show only multilayer (i.e., more than two layers) embodiments. Oral Arg. at 24:05-25, available at: https://oralarguments.cafc.uscourts.gov/default.aspx?fl=22-2063_03072024.mp3.

prosecution, claim 1 was amended to include the disputed term in an effort to overcome a rejection based on prior art that employed a calendering process. In remarks accompanying the amendment, Kirsch distinguished extrusion lamination, "which *bonds* the various layers together," from the prior art calendering, which "*affixes* the various layers together." J.A. 5071 (emphasis added). We agree with the Board that this amendment, and the applicant's explanation of it, focuses on "*how* the recited 'thermoplastic material' must be 'affixed'" rather than how many layers must be affixed together, and therefore contains "nothing to suggest that a person of ordinary skill in the art would have understood that amendment to add a requirement of an additional layer of thermoplastic material, separate and apart from the 'at least one layer of thermoplastic material' already recited in the original claim." J.A. 22. In sum, then, we agree with the Board that a skilled artisan would view the intrinsic evidence, taken as a whole, as supporting the Board's construction of "extrusion lamination" (requiring only two or more layers) and not the narrower construction advocated by Kirsch (requiring at least three layers).

The extrinsic evidence the Board considered only adds to our confidence in this conclusion. The Board relied on GAF's expert for its findings on the relationship between "extrusion lamination" and "extrusion coating." Substantial evidence supports the Board's determination that a person of skill in the art would understand the "extrusion lamination" of claim 1 not to be mutually exclusive from what such an artisan would understand to be "extrusion coating." The Board was free to credit, as it did, the testimony of GAF's expert, Mr. Kaczkowski, who explained that "an extrusion coating process, which results in the extrudate being permanently bonded to the substrate[,] would be understood, by a person of ordinary skill in the art, to be extrusion lamination." J.A. 6523 at 28:17-20; *see* J.A. 23; *see also Yorkey v. Diab*, 601 F.3d 1279, 1284 (Fed. Cir. 2010) ("We defer to the Board's findings concerning the

credibility of expert witnesses."). Kirsch's contention that its own evidence could support the opposite conclusion does not alter our holding. To the contrary, where, as here, two "inconsistent conclusions may be reasonably drawn from the evidence in record, [the Board's] decision to favor one conclusion over the other is the epitome of a decision that must be sustained upon review for substantial evidence." *Elbit Sys. of Am., LLC v. Thales Visionix, Inc.*, 881 F.3d 1354, 1356 (Fed. Cir. 2018).

Lastly, Kirsch argues that the Board erred in finding that its adopted construction was consistent with the construction adopted by the Eastern District of Texas. In evaluating the same "extrusion lamination" limitation from the same patent claim, the district court held that the proper construction was "by being melted in an extruder, and forced onto the reinforcing scrim through a die of the extruder." J.A. 6764. This construction is fully consistent with the Board's construction, as it results in a claim scope that encompasses a two-layer product in which the thermoplastic material has been "melted in an extruder, and forced onto the reinforcing scrim through a die of the extruder," and affixed to no additional layers. The district court's construction also does not exclude extrusion coating, as it includes "coating a surface with a polymer that is extruded," which is the construction of "extrusion coating" provided by Kirsch's own expert. J.A. 6660. Finally, we are also unpersuaded by Kirsch's speculative contention that the Board overlooked pertinent context from the district court litigation.

Thus, again, the intrinsic and extrinsic evidence support the Board's construction of "extrusion lamination," which neither limits the scope of claim 1 to embodiments containing three or more layers nor renders extrusion lamination and extrusion coating mutually exclusive.

C

Applying its construction, which we have now adopted as well, the Board found that prior art reference Lou anticipates the challenged claims of the '482 patent. We find substantial evidence supports the Board's conclusion. *See HTC Corp. v. Cellular Commc'ns Equip., LLC*, 877 F.3d 1361, 1368 (Fed. Cir. 2017) (holding anticipation, including whether prior art discloses every limitation, is question of fact reviewed for substantial evidence).

Most of Kirsch's challenges to the Board's conclusion are dependent on our accepting its position on claim construction, and, hence, are of no consequence now that we have adopted that construction. The only additional argument made by Kirsch concerns whether Lou discloses "pressing." As we have explained, we understand the Board's construction as implicitly including a "pressing" requirement. However, the Board's finding that Lou met this requirement because "Lou also uses pressure, not merely a coating process," is supported by substantial evidence. J.A. 38; *see also* J.A. 5193 at 2:50-51 (Lou stating "the coating and calendering steps . . . can be performed as a continuous process"); *In re NTP, Inc.*, 654 F.3d 1279, 1297 (Fed. Cir. 2011) (holding "what a reference teaches" is question of fact). Kirsch itself has recognized that calendering "uses hydraulic heat *and pressure* to join layer[s] together." J.A. 1217 (emphasis added). Therefore, Kirsch's appellate challenge fails.

III

We have considered Kirsch's remaining arguments and find them unpersuasive. For the foregoing reasons, we affirm.

AFFIRMED