

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ARTHREX, INC.,
Petitioner,

v.

P TECH, LLC,
Patent Owner.

IPR2022-01043
Patent 9,814,453 B2

Before JEFFREY N. FREDMAN, MICHELLEN. WORMMEESTER, and
CYNTHIA M. HARDMAN, *Administrative Patent Judges*.

HARDMAN, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

This is a Final Written Decision in an *inter partes* review challenging the patentability of claims 1–20 (all claims) of U.S. Patent No. 9,814,453 B2 (“the ’453 patent,” Ex. 1001). We have jurisdiction under 35 U.S.C. § 6.

Petitioner Arthrex, Inc. has the burden of proving unpatentability of the challenged claims by a preponderance of the evidence. 35 U.S.C. § 316(e). Having reviewed the parties’ arguments and cited evidence, for the reasons discussed below, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 1–20 are unpatentable.

A. *Procedural History*

Petitioner filed a Petition for *inter partes* review of claims 1–20 of the ’453 patent. Paper 1 (“Pet.”). Patent Owner P Tech, LLC did not file a Preliminary Response. In view of the then-available preliminary record, we instituted an *inter partes* review. Paper 6 (“Inst. Dec.”).

After institution, Patent Owner filed a Response. Paper 11 (“PO Resp.”). Petitioner filed a Reply. Paper 14 (“Reply”). Patent Owner filed a Sur-reply. Paper 18 (“Sur-reply”).

On September 5, 2023, we held an oral hearing, the transcript of which is of record. Paper 21 (“Tr.”).

B. *Real Parties in Interest*

Petitioner and Patent Owner each identify themselves as the real parties in interest. Pet. xvi; Paper 4 (Patent Owner Mandatory Notices), 2.

C. *Related Matters*

The parties identify *P Tech, LLC v. Arthrex, Inc.*, 1-21-cv-00968 (D. Del.), as a related matter. Pet. xvi; Paper 4, 2. The parties also identify several *inter partes* reviews relating to other patents asserted in the same

district court proceeding, namely IPR2022-00717, IPR2022-00786, IPR2022-00787, and IPR2022-01066, which respectively concern U.S. Patent Nos. 9,579,129, 9,999,449, 10,376,259 and 10,881,440. Pet. xvi; Paper 4, 2.

D. The '453 Patent (Ex. 1001)

The '453 patent, titled “Deformable Fastener System,” relates to an instrument and method for guiding and positioning surgical implants within the body.¹ Ex. 1001, code (54), 2:60–62.

The '453 patent explains that “[p]roper and more rapid healing of broken or fractured bones . . . may be facilitated by applying constant pressure to the bone,” and thus “physicians may insert pins, screws, or bolts in the area of the fracture in order to apply compression and stabilization to the fracture.” *Id.* at 1:36–40. The patent asserts, however, that “inserting screws through or around fractures can be complex and time-consuming,” including because “the process of inserting a screw typically involves multiple steps conducted from multiple incisions.” *Id.* at 141–48. Thus, the patent states that “a need exists for a method and device which can provide guided positioning and flexible or rigid fixation of tissue and/or an implant within the body while accessing the procedure site from a small skin portal.” *Id.* at 2:53–56.

¹ The '453 patent claims priority to a continuation application filed on October 5, 2005. Ex. 1001, code (63). Patent Owner contends that the priority date for the challenged claims is October 5, 2005, and Petitioner does not dispute this contention. PO Resp. 16; *see generally* Pet.; Reply. For purposes of this Decision, we use a priority date of October 5, 2005.

The '453 patent discloses an instrument that “may provide for the placement of a biocompatible implant within tissue and/or may provide for dynamic and rigid fixation of tissue.” *Id.* at 2:60–64. “The guidance and positioning device may be an all-in-one system for creating a passage in tissue, positioning fasteners or other implants, and tensioning an elongated fastening member, like a suture, thread, wire, or pin.” *Id.* at 4:54–57.

The “implant guidance and positioning device includes a body member connected with a hook,” where “[t]he hook may have a lumen extending therethrough.” *Id.* at 2:64–67. “The device may further include a pushrod for positioning a fastener and suture in the lumen of the hook.” *Id.* at 3:3–5.

We reproduce below Figure 4 of the '453 patent:

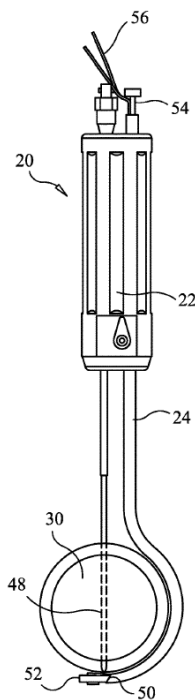


FIG. 4

Figure 4, reproduced above, illustrates an exemplary embodiment of the guidance and positioning device, comprising a cylindrical handle 22, hook

24, flexible pushrod 54, fastener 52, and suture 56. *See id.* at 5:2–5, 12:48–52. Figure 4 also depicts bone passage 48. *See id.* at 12:48–52. The patent explains that “[w]ith the fastener 52 and suture 56 on the distal end of the flexible pushrod 54, the pushrod 54 is moved distally through the lumen of the hook 24 until the fastener 52 is positioned generally next to the distal opening of the bone passage 48.”² *Id.*

The fastener 52 “may be connected with the pushrod 54 or may be loosely fitted with the distal end of the pushrod 54. A suture 56 is looped through or connected with the fastener 52 such that one, two, or more sections, legs, strands or portions of the suture 56 extend from the fastener 52.” *Id.* at 6:37–42. The fastener can be deformable, bendable, hollow, and/or knotless. *Id.* at 11:29–36.

E. The Challenged Claims

Petitioner challenges all twenty claims of the ’453 patent. Claims 1, 10, and 15 are independent. Claim 1, reproduced below with bracketed numbering added,³ is illustrative of the independent claims:

1. [1.P] A deformable fastener system comprising:
 - [1.1] a flexible hollow fastener fabricated solely from a plurality of biocompatible fibers;
 - [1.2] a suture extending through the hollow fastener such that two legs of the suture extend from the hollow fastener to

² Throughout this Decision, we omit bolding of reference numbers in quotes from the challenged patent and prior art references.

³ For ease of reference, we adopt the bracketed numbering Petitioner uses in the Petition to refer to various limitations of the independent claims. *See* Pet. xii–xiv.

enable a user to tension the suture, [1.3] wherein at least a portion of the suture is fabricated with polyethylene; and

[1.4] an introducer having a pushrod configured to engage the fastener and position the fastener relative to a body tissue, [1.5] wherein the hollow fastener and suture are positioned on the distal end of the pushrod, and

[1.6] wherein the hollow fastener is configured to deform from a first configuration to a second configuration to provide an anchor for the suture as the suture is tensioned relative to the body tissue; and

[1.7] wherein the hollow fastener includes a polymeric material.

Ex. 1001, 27:22–39. Dependent claims 2–7 depend directly from claim 1 and add additional features. For example, claim 2 further requires that “the suture includes at least a portion of polyester,” and claim 5 further recites that “the pushrod is flexible.” *Id.* at 27:40–41, 27:46.

Independent claim 8 is similar to claim 1, but lacks the requirement (recited in limitation [1.3]) that “at least a portion of the suture is fabricated with polyethylene.” *See id.* at 27:53–28:8. Dependent claims 9–13 and 19 depend directly from claim 8 and recite additional features. For example, claims 9–11 recite additional features of the suture, and claim 12 further recites that “the pushrod is flexible.” *Id.* at 28:9–14, 28:15.

Independent claim 14 recites a method of using a deformable fastener system. *Id.* at 28:19–36. Dependent claims 15–18 and 20 depend directly from claim 14 and add additional features, including features similar to those recited in the dependent claims highlighted above. *Id.* at 28:37–51, 28:54–56.

Of particular note, dependent claims 3, 19, and 20 recite that the “hollow fastener” is “knotless.” *Id.* at 27:42–43, 28:52–56.

F. Asserted Grounds of Unpatentability

We instituted trial based on the following grounds of unpatentability:

Ground	Claim(s) Challenged	35 U.S.C. § ⁴	Reference(s)/Basis
1	8, 11, 13, 14, 16, 18–20 ⁵	102	Fumex ⁶
2	1, 3, 4, 6–11, 13–16, 18–20	103	Fumex
3	1–4, 6, 9, 10, 15	103	Fumex, Grafton ⁷
4	5, 12, 17	103	Fumex, Bonutti '395 ⁸
5	5	103	Fumex, Grafton, Bonutti '395
6	3, 19, 20	103	Fumex, Bonutti '875 ⁹
7	1, 7	103	Bonutti '717 ¹⁰ , Fumex
8	1, 7	103	Bonutti '717, Fumex, Grafton

⁴ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended several provisions of 35 U.S.C., including §§ 102 and 103. Because the October 5, 2005, priority date we apply herein for the challenged claims (*see supra* n.1) is before the effective date of the applicable AIA amendments, we refer to the pre-AIA versions of 35 U.S.C. §§ 102 and 103.

⁵ Although the Petition indicates that claims 9 and 15 are challenged under Ground 1 (*see, e.g.*, the chart on page 2 of the Petition and the heading on page 23 of the Petition), the Petition does not provide argument for claims 9 and 15 under this Ground. Accordingly, we exclude claims 9 and 15 from Ground 1. *See* Inst. Dec. 7 n.5.

⁶ Fumex, US 6,511,498 B1, issued Jan. 28, 2003. Ex. 1004.

⁷ Grafton, US 2003/0050666 A1, published March 13, 2003. Ex. 1005.

⁸ Bonutti, US 6,238,395 B1, issued May 29, 2001. Ex. 1006.

⁹ Bonutti et al., US 5,735,875, issued April 7, 1998. Ex. 1007.

¹⁰ Bonutti, US 5,718,717, issued February 17, 1998. Ex. 1016.

Inst. Dec. 7–8, 28; Pet. 2–3. Petitioner supports its contentions with the Declaration of Steve E. Jordan, M.D. (Ex. 1002), among other evidence. Patent Owner supports its contentions with the Declaration of Robert A. Pedowitz, M.D., Ph.D. (Ex. 2001), among other evidence.

We note that in its Patent Owner Response, Patent Owner states that “[i]n an effort to reduce the issues for consideration by the Board,” it is only addressing claims 3, 19, and 20 (and not claims 1, 2, and 4–18). Our discussion herein primarily focuses on dependent claims 3, 19, and 20, which recite that the claimed “hollow fastener” is “knotless.” Nevertheless, because Petitioner bears the burden of proof on unpatentability of all claims (*see* 35 U.S.C. § 316(e)), we also address Petitioner’s unpatentability arguments relating to claims 1, 2, and 4–18.

II. ANALYSIS

A. *Legal Standards*

“In an IPR [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016); 37 C.F.R. § 42.104(b). This burden of persuasion never shifts to the patent owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review). To prevail, the petitioner must demonstrate unpatentability by a preponderance of the evidence. 35 U.S.C. § 316(e).

To show anticipation under 35 U.S.C. § 102, each and every claim element, arranged as in the claim, must be found in a single prior art reference. *See* 35 U.S.C. § 102 (2006); *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359 (Fed. Cir. 2008). To find anticipation, the prior art need not

use the same words as the claims. *In re Gleave*, 560 F.3d 1331, 1334 (Fed. Cir. 2009). Moreover, in evaluating an alleged anticipatory prior art reference, it is permissible to consider not only the literal teachings of the reference, but also the inferences a person of ordinary skill in the art would draw from the reference. *Eli Lilly and Co. v. Los Angeles Biomedical Res. Inst.*, 849 F.3d 1073, 1074–75 (Fed. Cir. 2017).

A claim is unpatentable as obvious under 35 U.S.C. § 103 if the differences between the claimed subject matter 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. 35 U.S.C. § 103(a) (2006); *see also KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved based on 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) any objective indicia of nonobviousness.¹¹ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). An obviousness determination requires finding a reason to combine accompanied by a reasonable expectation of achieving what is claimed in the patent-at-issue. *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367 (Fed. Cir. 2016). “[A]ny 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.” *KSR*, 550 U.S. at 419–20.

¹¹ Patent Owner does not present any objective indicia of nonobviousness in this proceeding.

B. Level of Ordinary Skill in the Art

We consider the grounds of unpatentability in view of the understanding of a person of ordinary skill in the art (sometimes abbreviated herein as “POSITA”). *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). Factors pertinent to determining the appropriate level of skill in the art include:

(1) the educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of active workers in the field The patent’s purpose can also be informative.

Best Medical Int’l, Inc. v. Elekta Inc., 46 F.4th 1346, 1353 (Fed. Cir. 2022) (citations omitted).

After considering the above factors and Petitioner’s proposed level of skill in the art, for purposes of our Institution Decision, we defined a person of ordinary skill in the art as someone having a medical degree and at least two years of experience performing surgeries with implantable medical devices, such as suture anchors. Inst. Dec. 10.

Patent Owner and its expert Dr. Pedowitz agree with our analysis in the Institution Decision, and employ our definition of a person of ordinary skill in the art. PO Resp. 16; Ex. 2001 (Pedowitz Decl.) ¶ 21. After institution, Petitioner did not dispute our definition. *See generally* Reply. Accordingly, and for the reasons discussed in our Institution Decision, we maintain our definition of a person of ordinary skill in the art as someone having a medical degree and at least two years of experience performing surgeries with implantable medical devices, such as suture anchors. *See* Inst. Dec. 8–10.

Based on their statements of qualifications and curricula vitae, we find Petitioner's expert Dr. Jordan and Patent Owner's expert Dr. Pedowitz qualified to provide technical opinions from the perspective of a person of ordinary skill in the art in this proceeding. *See* Ex. 1002 (Jordan Decl.) ¶¶ 2–9 (Dr. Jordan's statement of qualifications); Ex. 1003 (Dr. Jordan's curriculum vitae); Ex. 2001 (Pedowitz Decl.) ¶ 2 (Dr. Pedowitz's statement of qualifications), Appendix A (Dr. Pedowitz's curriculum vitae).

C. Claim Construction

We interpret a claim “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b).” 37 C.F.R. § 42.100(b). Under this standard, we construe the claim “in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” *Id.*

“[T]he ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention” and “after reading the entire patent” and its prosecution history. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313, 1321 (Fed. Cir. 2005) (en banc). The specification is usually dispositive, and is the single best guide to the meaning of a disputed term. *Id.* at 1315. Although extrinsic evidence including expert and inventor testimony, dictionaries, and learned treatises can be consulted, it is less significant than the intrinsic record. *Id.* at 1312–17.

Petitioner addresses the construction of two claim terms, “passage” and “knotless” fastener. Pet. 15–17. At institution, and in the absence of input from Patent Owner, we preliminarily construed “knotless” fastener,

and determined that we need not construe “passage” (or any other term).
Inst. Dec. 11.

After institution, Patent Owner addressed Petitioner’s construction of “passage,” and offered a construction of “knotless” fastener that differs from our preliminary construction. PO Resp. 16–19. We address both terms below.

1. Passage

Independent claim 14 recites a step of “inserting a deformable hollow fastener into a passage in a bone.” Ex. 1001, 28:21–22. Petitioner asserts that for purposes of this proceeding, it adopts Patent Owner’s “apparent construction” of the term “passage” in the co-pending litigation, which is “an opening into which something can be placed.” Pet. 11–12. Petitioner does not attempt to demonstrate that the Specification supports this construction, and in fact suggests that the intrinsic record signals a narrower construction, where the passage must “traverse[] the entire bone.” *See id.* at 11 (citing Ex. 1001, Figs. 2, 4, 5, 7–9); *see also* Ex. 1002 (Jordan Decl.) ¶ 39 (“I have been asked to apply a definition of ‘passage’ that is consistent with P Tech’s interpretation of that term in the related litigation. I have not been asked to consider or analyze the propriety of that interpretation.”).

Patent Owner asserts that “[a] POSITA would understand the plain and ordinary meaning of ‘passage’ to be ‘an opening into which something can be placed’ as asserted by Petitioner.” PO Resp. 19 (citing Ex. 2001 (Pedowitz Decl.) ¶ 46). Like Petitioner and Dr. Jordan, neither Patent Owner nor Dr. Pedowitz attempts to demonstrate that the Specification supports this construction or otherwise explains why this construction is appropriate. *See id.*

In the absence of any meaningful claim construction analysis of this term from the parties, and because we find that for purposes of resolving the disputes at issue in this Decision, a construction of “passage” is unnecessary, we decline to construe this term. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those 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)).

2. “Knotless” Fastener

Dependent claims 3, 19, and 20 recite a “hollow fastener” that is “knotless.” Ex. 1001, 27:42–43, 28:52–56. The construction of the term “knotless,” as applied to the hollow fastener, is dispositive in this case. *See* Sur-reply 1 (“It is undisputed that the claim construction of a ‘knotless’ fastener will decide this case.”); Reply 21 (asserting that “Patent Owner has not disputed that Fumex meets Petitioner’s proposed construction of ‘knotless.’”).

a) *Brief Overview of the Parties’ Proposed Constructions*

Petitioner asserts that the Specification “uses the term ‘knotless’ only once in a laundry list of fastener options, but does not define it.” Pet. 12 (citing Ex. 1001, 11:29–36). Petitioner contends that “[t]he term ‘knotless,’ as used in reference to a fastener, means a suture-restraining structure that can be retained in place without tying a knot at the site where the fastener is secured in place.” *Id.* (citing Ex. 1002 (Jordan Decl.) ¶¶ 40–48). Petitioner contends that this proposed construction “is consistent with the specification and prosecution history, as well as how those skilled in the art, including

orthopedic surgeons, identified ‘knotless’ fasteners at the relevant time.”
Id. at 12–13.

Patent Owner asserts that a person of ordinary skill in the art “would have understood that a ‘knotless fastener’ was not a term of art at the time of the invention of the ‘453 Patent,” and that “Patent Owner coined the term ‘knotless’ in describing its fasteners.” PO Resp. 16 (citing Ex. 2001 (Pedowitz Decl.) ¶ 38). To elaborate, Patent Owner seeks to ascribe different meanings to the term “knotless” depending on context. Patent Owner acknowledges a so-called “legacy art-specific meaning” of “knotless” in the context of “knotless suture anchors.” PO Resp. 17; Sur-reply 2. According to Patent Owner, in this context, “knotless” “defines *suture* fixation to a fastener without knot tying.” Sur-reply 15 (emphasis added); *see also* PO Resp. 17 (“[K]notless suture anchors’ were known by a POSITA to employ devices and methods that achieve reduction and fixation of tissue to bone without creation of suture knots (*i.e.*, knotless suture constructs).”); Ex. 2001 (Pedowitz Decl.) ¶ 38 (same); Sur-reply 6 (arguing that “the art-specific meaning of ‘knotless suture anchor’” was directed to “avoid[ing] surgical knot tying between two fasteners”), 9–10 (suggesting that the “legacy term of art” referred to retaining a suture in place without tying a knot).

Patent Owner contends that in contrast, the challenged claims relate to retaining or anchoring a *fastener* in bone (as opposed to retaining a suture in a fastener), and thus the “legacy art-specific meaning” of “knotless” in the context of “knotless suture anchors” is inapplicable. *See, e.g.*, Sur-reply 2, 6. Patent Owner further asserts that the inventors coined the term “knotless,” when used in the context of fasteners that anchor in bone, as

meaning “a fastener that can be retained relative to body tissue without a knot,” where “knot” means “an interlacing, twining, looping, etc. of a cord, rope, or the like, drawn tight into a knob or lump, for fastening, binding, or connecting two cords together or a cord to something else.” PO Resp. 16–18 (citing, *e.g.*, Ex. 2001 (Pedowitz Decl.) ¶¶ 37–38, 43; Ex. 2003 (Webster’s Dictionary¹²), 4).

Critically, Patent Owner’s proposed construction excludes the concept of “tying” that is recited in Petitioner’s proposed construction (i.e., Petitioner’s proposed construction recites, in part, “without *tying* a knot”). Patent Owner contends that the concept of “tying” a knot is “unduly restricted in scope,” because “tying is not required of a ‘knot’” per the definition of “knot” in Webster’s Dictionary. PO Resp. 20 (citing Ex. 2001 (Pedowitz Decl.) ¶ 41); *see also id.* at 18–19 (arguing that “[t]he Blackwell hitch, an exemplary knot illustrated along with the definition . . . does not involve tying”). In other words, unlike Petitioner’s proposed construction, Patent Owner’s proposed construction does not require elimination of *knot tying*; instead, it more broadly eliminates any *knot* in a fastener, including a preformed knot. *See* Tr. 7:20–25.

b) Analysis

There are two main issues in dispute regarding the construction of “knotless,” i.e., (1) whether, in the context of the claimed hollow fasteners, a “knotless” fastener means “a suture-restraining structure that can be retained in place without *tying* a knot at the site where the fastener is secured in place” (as Petitioner proposes), or whether “knotless” has a broader meaning

¹² Random House Webster’s Unabridged Dictionary (2001) (Ex. 2003).

that implicates eliminating **any** knot in the fastener, including preformed knots (as Patent Owner proposes); and (2) whether we should adopt Patent Owner’s proposed construction of “knot” as meaning “an interlacing, twining, looping, etc. of a cord, rope, or the like, drawn tight into a knob or lump, for fastening, binding, or connecting two cords together or a cord to something else.” *See* Tr. 7:13–8:6 (Petitioner’s counsel explaining the key differences between the parties’ proposed constructions). After considering all of the arguments and evidence of record, for the reasons discussed below, we find that Petitioner’s proposed construction better aligns with the intrinsic and extrinsic evidence of record.

(1) Whether the construction of “knotless” requires eliminating knot “tying”

We begin by analyzing whether “knotless” means eliminating “**tying**” a knot in connection with the claimed fasteners. To set the stage for our analysis, we note that Patent Owner essentially concedes that in at least one context—namely, the context of retaining a suture within a fastener—a person of ordinary skill in the art would have understood that the “art-specific” meaning of “knotless” is “without tying a knot.” *See, e.g.*, PO Resp. 17 (“[K]notless suture anchors’ were known by a POSITA to employ devices and methods that achieve reduction and fixation of tissue to bone without creation of suture knots (*i.e.*, knotless suture constructs).”); Ex. 2001 (Pedowitz Decl.) ¶ 38 (same); Sur-reply 6 (arguing that “the art-specific meaning of ‘knotless suture anchor’” was directed to “avoid[ing] surgical knot tying between two fasteners”), 9–10 (suggesting that the “legacy term of art” referred to retaining a suture in place without tying a knot), 15

(“[T]he legacy term defines suture fixation to a fastener without knot tying.”).

As noted above, however, Patent Owner attempts to draw a distinction between these known “knotless suture anchors” and the claimed “knotless” fasteners. According to Patent Owner’s expert Dr. Pedowitz, the claimed fasteners “pertain to a method of *fastener retention* within bone,” rather than *suture retention* in a fastener. Ex. 2001 (Pedowitz Decl.) ¶ 38 (emphasis added). Patent Owner and Dr. Pedowitz assert that in this context (i.e., methods of fastener retention within bone), a person of ordinary skill in the art “would have understood that a ‘knotless fastener’ was not a term of art at the time of the invention of the ‘453 Patent.” *Id.*; PO Resp. 17–18. Instead, Patent Owner argues that it “coined” a new meaning of the term “knotless” in the context of the claimed fasteners, i.e., “a fastener that can be retained relative to body tissue without a knot,” where “knot” means “an interlacing, twining, looping, etc. of a cord, rope, or the like, drawn tight into a knob or lump, for fastening, binding, or connecting two cords together or a cord to something else.” PO Resp. 17–18.

Against this backdrop, the question we must decide is whether the so-called “legacy” understanding in the art of the term knotless, as it admittedly applies to suture retention in knotless suture anchors, also applies to the claimed fasteners. *See* Tr. 9:3–9. In analyzing this question, we begin with the language of the claims themselves. *See Philips*, 415 F.3d at 1314 (“[T]he claims themselves provide substantial guidance as to the meaning of particular claim terms.”).

As an initial matter, Patent Owner does not persuade us that each of challenged claims 3, 19, and 20 relates **only** to *fastener retention*, to the

exclusion of *suture retention*, such that a person of ordinary skill in the art would have discarded the so-called “legacy” meaning of “knotless” as irrelevant to the claims. *See* Sur-reply 2 (Patent Owner arguing that “Dr. Pedowitz distinguished the art-specific meaning of the legacy term ‘knotless suture anchor,’ which is directed to *suture retention* and is *not* directed to *fastener retention* in body tissue such as bone.”), 5–6 (Patent Owner arguing that “[T]he **context** for claim construction is **retention of a fastener in body tissue**, particularly in bone, wherein a suture extending through the fastener is used to deform the fastener **to anchor the fastener within the body tissue.**”).

Specifically, independent claim 1 (from which challenged claim 3 depends) recites a suture extending through a flexible hollow fastener, “wherein the hollow fastener is configured to deform from a first configuration to a second configuration *to provide an anchor for the suture* as the suture is tensioned relative to the body tissue.” Ex. 1001, 27:22–37 (emphasis added). Similarly, independent claim 8 (from which challenged claim 19 depends) recites a suture extending through a flexible hollow fastener, “such that two legs of the suture extend from the hollow fastener to enable a user to tension the suture to deform the hollow fastener from a first configuration to a second configuration *to anchor the suture within the body.*” Ex. 1001, 27:53–28:5 (emphasis added).

Given the plain language of these claims, which include recitation of a deformable fastener to *anchor the suture*, Patent Owner does not persuade us that a person of ordinary skill in the art would have considered the so-called “legacy” meaning of “knotless” so inapt as to recognize that Patent Owner “coined” a new, different meaning of this term in the context of the

claimed fasteners. *See also* Tr. 15:2–17 (Petitioner’s counsel disputing that the challenged claims relate only to fastener retention (and not suture retention)).

Additionally, Patent Owner’s expert Dr. Pedowitz acknowledged that the term “suture anchor” is interchangeable with the claim term “fastener.” *See* Ex. 1018 (Pedowitz Depo. Tr.), 19:22–20:11 (cited at Reply 2 n.1); Tr. 10:7–16 (Petitioner’s counsel asserting that “[i]f suture anchor and fastener are one and the same, then it’s only consistent with [Petitioner’s] construction that knotless suture anchor and knotless fastener should also be one and the same.”). This further undercuts Patent Owner’s effort to create a distinction between use of the term “knotless” in the context of “knotless suture anchors” versus in the context of the claimed fasteners.

Turning to how the term “knotless” is used in dependent claims 3, 19, and 20, we note that although each of these claims recites that the “hollow fastener” is “knotless,” the claims do not otherwise provide insight into the meaning of “knotless.” *See* Ex. 1001, 27:42–43, 28:52–56. Patent Owner appears to suggest that a person of ordinary skill in the art would have grasped that Patent Owner intended to use the term “knotless” in a different way than the so-called “legacy” meaning because “the ‘knotless’ claims depend[] from fastener system or method claims that do not recite a second fastener for creating a knotless suture construct.” PO Resp. 17. However, “to deviate from the plain and ordinary meaning of a claim term to one of skill in the art, the patentee must, with some language, indicate a clear intent to do so in the patent.” *Hill-Rom Servs., Inc. v. Stryker Corp.*, 755 F.3d 1367, 1373 (Fed. Cir. 2014). We find that the structure of the claims fails to

provide sufficient clarity to indicate an intent to deviate from the known (“legacy”) meaning of “knotless.”

We next turn to the Specification. *See Philips*, 415 F.3d at 1315 (“[C]laims must be read in view of the specification, of which they are a part.”) (citations omitted). As Petitioner correctly states, the Specification recites the term “knotless” only once, in a “list of possible characteristics that a fastener used in the invention may have.” Reply 1; *see also id.* at 4; Ex. 1002 (Jordan Decl.) ¶ 41 (“‘[K]notless’ appears in the specification only once, in a laundry list of fastener properties purportedly compatible with the deformable fastener system, without any explanation.”); Ex. 1001, 11:29–36 (“[T]he fasteners may be . . . one-piece, Morse taper single piece, multi-component, solid, hollow, polygon-shaped, pointed, locking and unlocking, self-introducing, knotless, and combinations thereof”). This single usage of “knotless” in the Specification does not indicate that the inventors intended to “coin” a special meaning for this term.

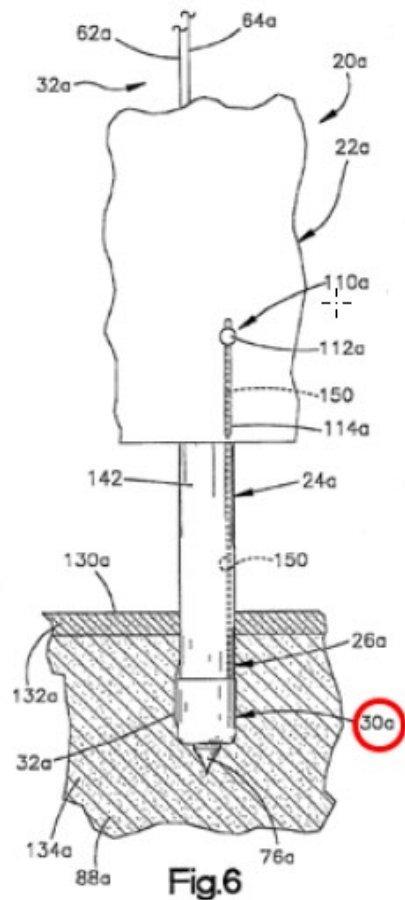
The only other portion of the Specification the parties call to our attention is column 15, lines 34 through 53, which is “[t]he only disclosure in the ’453 Patent regarding a knot.” Ex. 1002 (Jordan Decl.) ¶ 42; PO Resp. 19; Ex. 2001 (Pedowitz Decl.) ¶ 42; Reply 4–5, 18. This portion of the Specification refers to sections of suture that “may be secured with a knot *or* a fastener.” Ex. 1001, 15:34–54 (emphasis added). We agree with Petitioner that the Specification here “describes the use of a fastener to retain suture portions as an alternative to a surgeon tying a knot.” Reply 18; *see also id.* at 4–5; Ex. 1002 (Jordan Decl.) ¶ 42. We also agree with Petitioner that this disclosure “support[s] Petitioner’s position that knotless refers to a suture anchor that can be retained in place without tying a knot.” Reply 18.

In its Sur-reply, Patent Owner argues that this portion of the Specification describes an “unclaimed embodiment of the Patent that is irrelevant to the ‘453 claims.”¹³ Sur-reply 20; *see also id.* at 3 (“[T]his unclaimed embodiment involves a fastener for capturing one or more sutures without tying a knot, which is inapt to the ‘knotless’ fastener claim term at issue here.”), 16 (“Dr. Jordan’s statements that a suture fastener can be ‘knotless’ when used as an alternative to a knot are also out of context as these statements relate to how a fastener can be used to capture a suture, not how a fastener is retained in bone without a knot.”), 20 (“Retaining suture with a fastener as an alternative to a surgeon tying a knot (Ex. 1001, 15:34-53) concerns suture fixation, and not fixation of a fastener in bone without a knot.”). By these statements, we understand Patent Owner to be conceding that this portion of the Specification uses the term “knotless” in accordance with the so-called “legacy” meaning (i.e., “without tying a knot”). This again supports Petitioner’s construction, and undercuts any argument that the Specification demonstrates that Patent Owner coined a new meaning of the term “knotless.”

In sum, nothing in the Specification suggests that Patent Owner “coined” a special meaning for the term “knot” or “knotless.” Instead, the Specification’s use of these terms is consistent with the plain and ordinary meaning of the term to a person of ordinary skill in the art.

¹³ We note that in its Patent Owner Response, Patent Owner took an inconsistent position regarding this portion of the Specification. Instead of asserting that it is “irrelevant to the ‘453 claims,” Patent Owner stated (without any explanation) that this portion of the Specification is consistent with its proposed construction of “knot.” *See* PO Resp. 19.

We next consult the prosecution history. *See Philips*, 415 F.3d at 1317. During prosecution, the Examiner deemed a prior art anchor to be a knotless fastener. *See, e.g.*, PO Resp. 17–18; Sur-reply 7; Ex. 1002 (Jordan Decl.) ¶¶ 43–48. We reproduce below Patent Owner’s annotated graphic of the prior art fastener cited by the Examiner:



PO Resp. 18. The graphic above is Figure 6 of US 2001/0002440 A1, (“Bonutti ’440,” Ex. 1017). This figure depicts anchor inserter 20a, with a red circle highlighting suture anchor 30a. *See* Ex. 1017 (Bonutti ’440) ¶ 106. The Examiner characterized anchor 30a in Bonutti ’440 as “knotless,” but did not indicate what he understood “knotless” to mean. *See* Ex. 1009 (prosecution history of U.S. Patent Application No. 13/871,892),

556 (with reference to anchor 30a in Bonutti '440, stating, “[t]he fastener is knotless (e.g. Fig. 6)” and “is configured to deform and provide an anchor for the suture”).

The parties agree that anchor 30a in Bonutti '440 is indeed knotless, and both argue that the Examiner's statement supports their proposed construction. *See* PO Resp. 17–18; Ex. 2001 (Pedowitz Decl.) ¶ 39; Sur-reply 7; Ex. 1002 (Jordan Decl.) ¶¶ 43–48. The Examiner, however, did not explain his understanding of the term knotless. Accordingly, we are unable to ascertain the precise meaning the Examiner had in mind in using this term. *See Philips*, 415 F.3d at 1317 (recognizing that the prosecution history “often lacks the clarity of the specification and thus is less useful for claim construction purposes”).

Nevertheless, we find that the prosecution history better supports Petitioner's proposed construction, rather than Patent Owner's. This is because there is no express signal in the Specification (or in the prosecution history) that Patent Owner “coined” a new usage of the term; indeed, the Examiner did not reference any purportedly new usage. We thus find it unlikely that the Examiner understood or was using Patent Owner's new (and unstated) meaning of the term. Instead, Patent Owner recognizes a so-called “legacy” meaning of the term “knotless,” and there is no suggestion in the prosecution history that the Examiner was applying anything other than this known meaning.

In sum, the Specification and prosecution history use the terms “knotless” and “knot” in ways consistent with their known meanings in the art. “[T]o deviate from the plain and ordinary meaning of a claim term to one of skill in the art, the patentee must, with some language, indicate a clear

intent to do so in the patent.” *Hill-Rom Servs., Inc.*, 755 F.3d at 1373. The Specification and prosecution history are devoid of any clear intention to deviate from the so-called “legacy” meaning of “knotless,” as admittedly used in the context of “knotless suture anchors.” We see nothing in the intrinsic record that supports Patent Owner’s argument that it “coined” a different meaning for this term in connection with the claimed fasteners. We agree with Petitioner that “it strains logic that [inventor] Dr. Bonutti would include ‘knotless’ within a lengthy list of characteristics that a fastener could take on—and without any further explanation, definition, or stated benefits—if he intended ‘that it wasn’t the way the term might commonly have been used at that time.’” Reply 5–6 (quoting Ex. 1018 (Pedowitz Depo. Tr.), 20:15–22); *see also* Ex. 1018 (Pedowitz Depo. Tr.), 24:6–26:1, 27:12–18 (Dr. Pedowitz unable to identify any other portions of the Specification that use or define the term “knotless”), 27:19–24 (admitting that the Specification does not identify any benefits of a “knotless fastener” (per Patent Owner’s proposed construction)).

At the hearing, Patent Owner’s counsel appeared to backtrack from the position that Patent Owner coined a new term. *See* Tr. 48:14–49:7 (“Well, Dr. Pedowitz is the one who used the word coined So I don’t think this is a case where somebody truly coined a term in the patent law sense.”). But the “coined” argument very clearly appears in Patent Owner’s Response. *See* PO Resp. 17 (“[H]ere, Patent Owner coined the term ‘knotless’ in describing its fasteners.”). In any event, we agree with Patent Owner’s counsel that this is not a case where the inventor “coined a term in the patent law sense.” Tr. 49:6–7. Again, the intrinsic record lacks the necessary clear intention to deviate from the plain and ordinary meaning of

“knotless” to one of skill in the art. *See Hill-Rom Servs., Inc.*, 755 F.3d at 1373; *Thorner v. Sony Comput. Entm’t Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012) (“To act as its own lexicographer, a patentee must clearly set forth a definition of the disputed claim term other than its plain and ordinary meaning.”).

As suggested above, the extrinsic evidence of record demonstrates that persons of ordinary skill in the art understood “knotless” to have a particular meaning. *See Philips*, 415 F.3d at 1318 (indicating that extrinsic evidence can be useful to establish that a term has a particular meaning in the pertinent field). The parties agree that, in at least one context (suture retention in knotless suture anchors), the term “knotless” had a plain and ordinary meaning to persons of ordinary skill in the art of “without tying a knot.” *See, e.g.*, PO Resp. 17 (“‘[K]notless suture anchors’ were known by a POSITA to employ devices and methods that achieve reduction and fixation of tissue to bone without creation of suture knots (*i.e.*, knotless suture constructs).”); Ex. 2001 (Pedowitz Decl.) ¶ 38 (same); Sur-reply 6 (noting “the art-specific meaning of ‘knotless suture anchor,’” which was directed to “avoid[ing] surgical knot tying between two fasteners”), 15 (“[T]he legacy term defines suture fixation to a fastener without knot tying . . .”), 9–10 (suggesting the same); Pet. 12–13; Ex. 1002 (Jordan Decl.) ¶ 48.

Understanding “knotless” to mean “without tying a knot” is consistent with what was known at the time of the invention regarding knot-tying during surgery. As Patent Owner’s expert Dr. Pedowitz admitted, in the types of surgical procedures that were relevant to the challenged patent, a person of ordinary skill in the art would have known that knot-tying was challenging and time-consuming. *See* Ex. 1018 (Pedowitz Depo. Tr.),

27:25–29:2; *see also* Ex. 1007 (Bonutti ’875), 6:47–49 (“It is difficult to tie a suture knot to itself or to slide it down through deep tissue in a limited working area”); Reply 6. In contrast, neither the prior art nor the Specification identify any reason to remove “*any* ‘interlacing, twining, looping, or connecting’ of two suture sections,” as called for by Patent Owner’s proposed construction. *See* Reply 6 (quoting Ex. 2001 (Pedowitz Decl.) ¶ 41) (emphasis added); Ex. 1018 (Pedowitz Depo. Tr.), 27:19–24 (admitting that the Specification does not identify any benefits of a “knotless fastener” (per Patent Owner’s construction)).

In its Reply, Petitioner discusses Exhibits 1019–1023, which it newly filed together with its Reply. Petitioner argues that Exhibits 1019–1023 are prior art references that describe surgical procedures similar to those in the challenged patent, all of which (1) use the term “knotless suture anchor” to mean the elimination of surgical knot tying; and (2) have a “knot” under Patent Owner’s dictionary definition, but are nevertheless described as “knotless.” Reply 6–7, 20; *see also id.* at 7–15 (chart describing Exs. 1019–1023). Patent Owner argues that these references are irrelevant to claim construction because they use “knotless” consistent with the allegedly inapt “legacy art-specific meaning” of *suture retention* without tying a knot, as opposed to describing *fastener retention* in body tissue without a knot. *See* Sur-reply 10.

The parties’ arguments concerning the disclosures of Exhibits 1019–1023 consist largely of quoted excerpts from the references; Petitioner’s chart also includes out-of-context quotes from Dr. Pedowitz’s deposition. *See* Reply 7–15; Sur-reply 10–18. Neither party describes the relevant disclosures in these exhibits in sufficient detail for us to evaluate the parties’

respective arguments regarding the how the disclosed devices and surgical methods operate. *See DeSilva v. DiLeonardi*, 181 F.3d 865, 867 (7th Cir. 1999) (“[A] brief must make all arguments accessible to the judges . . .”). Additionally, Petitioner fails to adequately explain how Dr. Pedowitz’s quoted testimony supports its proposed construction or refutes Patent Owner’s proposed construction.

Nevertheless, Patent Owner admits that Exhibits 1019–1023 describe “knotless suture anchors,” where “knotless” is used consistent with the so-called “legacy” meaning of knotless (i.e., “without tying a knot” in the suture). *See, e.g.*, Tr. 34:12–16 (Patent Owner’s counsel acknowledging that “all of the prior art that was discussed there, we’re talking about a suture anchor and it being knotless, and the desire to be knotless is so that the surgeon doesn’t have to tie a knot when they’re trying to secure tissue in the operating room.”), 48:8–12 (“They’re called a knotless suture anchor because the surgeon doesn’t have to tie a knot [in the suture] in the surgery room when you use these . . . because in each of them, the suture is secured to the fastener without a knot.”). Accordingly, these references support that in at least certain contexts (suture retention in “knotless suture anchors”), persons of ordinary skill in the art recognized a plain and ordinary meaning of the term “knotless” as meaning “without tying a knot.”

Patent Owner argues that “[i]n Reply, Petitioner attempts to newly adopt the art-specific meaning of ‘knotless suture anchor’ as its construction.” Sur-reply 2; *see also id.* at 4, 9–10. Patent Owner’s argument is unclear, because other than offering to delete certain words from its proposed construction, Petitioner did not change its proposed claim

construction on Reply.¹⁴ Additionally, Petitioner argued in the Petition that its construction is consistent with how persons of ordinary skill in the art understood the term “knotless.” *See* Pet. 12–13. We do not understand Petitioner to have introduced a new, third construction into the record, as Patent Owner suggests, or to have changed theories regarding claim construction.¹⁵ *See* Sur-reply 4.

Additionally, Patent Owner itself introduced the concept of “knotless suture anchors.” *See, e.g.*, PO Resp. 17. It is appropriate for Petitioner to respond to Patent Owner’s arguments, including to clarify its own claim construction arguments, *e.g.*, by arguing that this so-called “legacy” understanding is consistent with its proposed construction. *See, e.g.*, Reply 6; *Axonics, Inc. v. Medtronic, Inc.*, 75 F.4th 1374, 1380 (Fed. Cir. 2023) (“[U]nder the Board’s rules and consistent with the Supreme Court’s decision in *SAS* [*SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348 (2018)], a

¹⁴ On Reply, Petitioner proposed to delete the portion of its construction reciting “at the site where the fastener is secured in place.” *See* Reply 3 n.2. Petitioner argued that Dr. Pedowitz took issue with this phrase, but it “is not critical to Petitioner’s argument or the relevant dispute.” *See id.* Because this proposal does not resolve any dispute between the parties (*see* Sur-reply 8, 9 (acknowledging Petitioner’s purported deletion, but arguing that Petitioner’s proposed construction still fails)), we retain this language per Petitioner’s original proposal in the Petition.

¹⁵ Patent Owner also argues that because Petitioner presents no expert testimony to rebut Dr. Pedowitz’s opinion that the so-called “legacy art-specific meaning of ‘knotless suture anchor’” does not apply in the context of the claimed fasteners, we should disregard certain arguments in Petitioner’s Reply. *See* Sur-reply 2, 4, 15–16, 21–22. On the full trial record, we do not find that rebuttal expert testimony is necessary, including because we find Patent Owner’s arguments and Dr. Pedowitz’s opinions to be unavailing, as discussed herein.

petitioner is entitled to respond to new arguments made in a patent owner response.”); *Apple Inc. v. Andrea Elecs. Corp.*, 949 F.3d 697, 706–07 (Fed. Cir. 2020) (“[T]he petitioner in an inter partes review proceeding may introduce new evidence after the petition stage if the evidence is a legitimate reply to evidence introduced by the patent owner.”); *Chamberlain Group, Inc. v. One World Techs., Inc.*, 944 F.3d 919, 925 (Fed. Cir. 2019) (“Parties are not barred from elaborating on their arguments on issues previously raised.”).¹⁶

Finally, on Sur-reply, Patent Owner contends that the phrase “without tying a knot” in Petitioner’s proposed construction renders the construction “fatally flawed.” Sur-reply 1. This is because, Patent Owner contends, the phrase is meaningless given that “all bone anchors are retained in place in bone without tying a knot.” *Id.*; *see also id.* at 8–9 (citing Ex. 1018 (Pedowitz Depo. Tr.) 12:16–25, which states, “[S]ince these are anchors that go within bone, it’s literally impossible to tie a knot at the site where the fastener is secured. I don’t know how one would tie a knot within bone.”), 21, 22. Patent Owner did not make this argument in its Patent Owner Response such that Petitioner had an opportunity to respond to it in the Reply, and thus this argument is untimely and forfeited. *See, e.g.*, Inst. Dec. 28 (“The Board will deem forfeited any issue not raised by Patent Owner in a timely response to the Petition.”); *Ford Motor Co. v. Safe*

¹⁶ Petitioner also argues that Patent Owner’s proposed construction of “knotless” is inconsistent with Patent Owner’s infringement contentions in the underlying litigation. *See* Reply 16–17. Patent Owner disputes this contention. *See* Sur-reply 3, 19–20. We decline to interpret or comment on Patent Owner’s alleged infringement positions in the co-pending litigation.

Driving Techs. LLC, IPR2022-00086, Paper 25 at 85 (PTAB May 15, 2023) (refusing to consider new arguments raised for the first time in Sur-Reply).

However, even if we were to consider this argument, it is unavailing for two reasons. First, of claims 3, 19, and 20, only claim 20 is specific to fastener retention in bone. Claims 3 and 19 more broadly encompass other types of tissue. Specifically, in claim 3, the “hollow fastener is configured to deform . . . to provide an anchor for the suture as the suture is tensioned relative to *the body tissue*.”¹⁷ Ex. 1001, 27:34–37 (emphasis added). Similarly, in claim 19, the hollow fastener is deformable “to anchor the suture *within the body*.” *Id.* at 27:55–28:5 (emphasis added). Patent Owner does not argue that it is impossible to tie a knot in *all* body tissue. Thus, Patent Owner’s argument is unavailing for at least claims 3 and 19. Second, even if Patent Owner is correct that the phrase “without tying a knot” would be meaningless in the context of anchoring a fastener in bone, “courts may not redraft claims, whether to make them operable or to sustain their validity.” *Chef Am., Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 1374 (Fed. Cir. 2004) (citation omitted). “[W]e construe the claim as written.” *Id.*

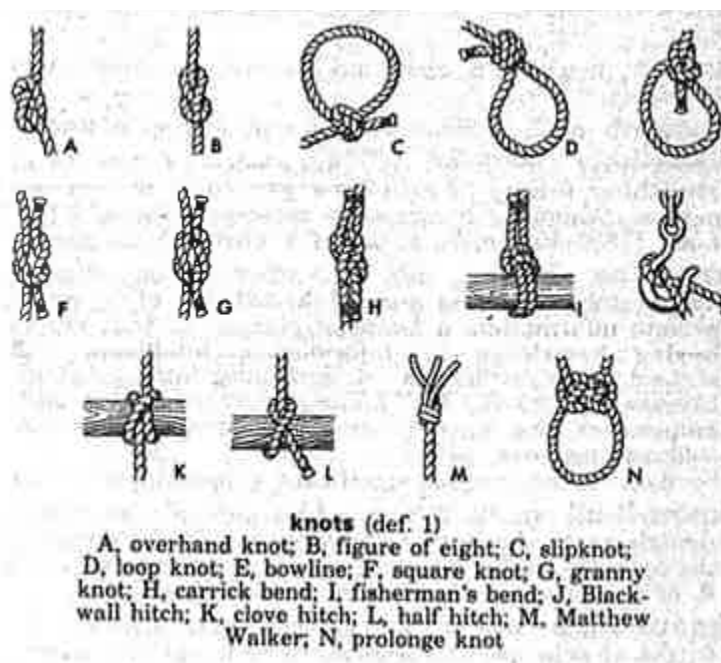
In sum, on the full trial record, we are presented with a situation where the parties agree that, at least in certain contexts (suture retention in “knotless suture anchors”), there was a plain and ordinary meaning of the term “knotless” as meaning “without tying a knot.” Patent Owner contends that it “coined” a different, broader meaning of this term in connection with the challenged claims. For the reasons discussed above, we find that Patent

¹⁷ The Specification states that “[e]xamples of body tissue include bone, collagen, cartilage, ligaments, or tissue graft material like xenograft, allograft, autograft, and synthetic graft material.” Ex. 1001, 11:41–44.

Owner's argument that it coined a new meaning lacks credibility. We see no indication that the term "knotless" in the context of the '453 patent or claimed knotless fasteners carries a meaning different than the admitted understanding of "knotless" in the context of "knotless suture anchors," as meaning "without tying a knot."

(2) Whether "knot" means "an interlacing, twining, looping, etc. of a cord, rope, or the like, drawn tight into a knob or lump, for fastening, binding, or connecting two cords together or a cord to something else"

We now turn to the second key claim construction issue we need to resolve, i.e., whether to adopt Patent Owner's proposed construction of "knot" as meaning "an interlacing, twining, looping, etc. of a cord, rope, or the like, drawn tight into a knob or lump, for fastening, binding, or connecting two cords together or a cord to something else." See PO Resp. 18 (quoting Ex. 2003 (Webster's Dictionary), 4). The dictionary from which Patent Owner quotes its definition of knot includes the following image:



The image above, which we reproduce from Webster's Dictionary, depicts fourteen different types of "knots," labelled A–N. Patent Owner specifically calls our attention to the "Blackwall hitch" (example J, right side of middle row). PO Resp. 18. In the image above, the Blackwall hitch is shown as a hook with a rope looped around it.

We find on the complete trial record that Patent Owner's proposed construction of "knot" is unsupported. First, Patent Owner contends that its dictionary definition of "knot" is consistent with the Specification, but fails to adequately explain the basis for this statement. PO Resp. 19 (citing Ex. 1001, 11:36, 15:34–53); *see also* Ex. 2001 (Pedowitz Decl.) ¶ 42. Patent Owner cites column 11, line 36 of the Specification, which merely uses the word "knotless" without any further elaboration. PO Resp. 19. Patent Owner also cites column 15, lines 34 through 53. *See id.* As discussed above (*see supra* Section II.C.2.b.1), this portion of the Specification refers to sections of suture that "may be secured with a knot *or* a fastener."

Ex. 1001, 15:34–54 (emphasis added). Patent Owner fails to explain—and we are unable to ascertain—how this paragraph is purportedly consistent with Patent Owner’s proffered dictionary definition of the term “knot.” In any event, Patent Owner later disavows this portion of the Specification as “inapt to the ‘knotless’ fastener claim term at issue here.” Sur-reply 3; *see also id.* at 20 (“Retaining suture with a fastener as an alternative to a surgeon tying a knot (Ex. 1001, 15:34-53) concerns suture fixation, and not fixation of a fastener in bone without a knot.”).

Patent Owner appears to rely on the dictionary definition to support an argument that “knots” do not necessarily require tying. Specifically, in calling out the Blackwall hitch, Patent Owner argues that although the dictionary deems it a knot, it “does not involve tying.” PO Resp. 18; Ex. 2001 (Pedowitz Decl.) ¶ 41 (same). However, as Dr. Jordan testifies, in the context of the types of surgeries relevant here, a person of ordinary skill in the art would not have described a hitch as a knot. Specifically, when Dr. Jordan was asked whether a jumble of half-hitches anchored in a bone passage would be characterized as a knot, he responded:

In the traditional sense, I wouldn’t characterize it as a knot. I would characterize it as an anchor, much like any configuration that deforms and then becomes in a different shape and can’t passage back out. But the half[hitches]¹⁸ are considered knots, but it’s not the ordinary term for a knot.

In the normal practice of surgery that sort of thing has been done and it’s not what we dictate in an operative note as a

¹⁸ The deposition transcript uses the phrase “half inches” instead of “half hitches.” Both parties confirmed that “half inches” is a typographical error, and that “half hitches” is the correct term. *See* Tr. 17:11–15, 50:24–51:4. Patent Owner’s counsel explains that a “half hitch” is “a loop that’s drawn tight in a bow.” *Id.* at 51:3–4.

knot was tied. We would say, the anchor was deployed and fixed to the tissue with resistance or another description, depending on what you do.

Ex. 2002 (Jordan Depo. Tr.), 40:7–41:17. Counsel further asked, “You’d agree, wouldn’t you, that that collection of half[hitches] that kept the suture from being pulled from the bone is a knot?,” and Dr. Jordan replied: “Yes. But as I described it, we don’t normally talk about it like that. But I agree, you used what was normally known as a knot to fix the suture to the bone.” *Id.* at 41:19–42:4. In other words, although Dr. Jordan acknowledged that in general parlance a hitch is characterized as a knot, in the context of surgeries like those relevant here, a person of ordinary skill in the art would not have considered a hitch a knot. *See id.*; Reply 21 n.6.

For the above reasons, we find that Patent Owner’s proffered dictionary definition of “knot” to be inapt, because it does not represent the plain and ordinary meaning of the term “knot” is used in the relevant art. *Cf. Phillips*, 415 F.3d at 1322 (“[A] general-usage dictionary cannot overcome art-specific evidence of the meaning’ of a claim term.” (quoting *Vanderlande Indus. Nederland BV v. Int’l Trade Comm’n*, 366 F.3d 1311, 1321 (Fed. Cir. 2004))). Accordingly, we do not adopt Patent Owner’s proposed dictionary definition of “knot.” Moreover, we determine that the term “knot,” which does not even appear in the challenged claims, does not need a construction separate from the construction of “knotless.”

c) Conclusion – Construction of “Knotless” Fastener

On the full trial record, for the reasons discussed above, we adopt Petitioner’s interpretation of “knotless,” as used in reference to a fastener, as

meaning a suture-restraining structure that can be retained in place “without tying a knot at the site where the fastener is secured in place.”

3. *Conclusion on Claim Construction*

For the reasons discussed above, we construe “knotless” as specified above in Section II.C.2.c. We determine that no other claim terms, including “passage,” need a construction in order to resolve the disputes at issue in this proceeding. *See Realtime Data, LLC*, 912 F.3d at 1375.

D. *Overview of the Asserted Prior Art*

1. *Fumex (Ex. 1004)*

Fumex is a U.S. patent that teaches surgical bone anchoring devices, which require “only the prior boring of a single hole with any wall shape, without requiring tapping, and permitting fixation of organs such as tendons and ligaments, or suspension of the cervix of the uterus, using a surgical thread or a suture thread without the need to use a means of the screw or piton type.” Ex. 1004, 2:3–8.

Fumex teaches the anchoring device “comprises a deformable tubular sleeve, associated with means capable of deforming it between a first stretched position of small diameter and a second folded position of greater diameter.” *Id.* at 2:14–17. Fumex teaches the “means capable of deforming the sleeve are made up of a thread passing through the deformable tubular sleeve along its axis and forming a closed loop.” *Id.* at 2:25–28. Fumex teaches the “closure of the loop can be obtained by simple crossing of the two strands of the thread, on either side of the deformable sleeve.” *Id.* at 2:41–43. Fumex explains that

by exerting a traction on the strands of the thread in diverging directions, the sleeve is folded until it presents approximately the form of a ball which, because its diameter is greater than that of the sleeve, is compressed against the walls of the hole into which the sleeve has been introduced. By reason of this pressure, the device is then held firmly in the hole bored in the bone.

Id. at 3:10–17.

Figure 1 of Fumex, reproduced below, is “a diagrammatic view of a fixation thread according to the present invention, introduced into a U-shaped sleeve, before tightening and deformation.” *Id.* at 5:21–23.

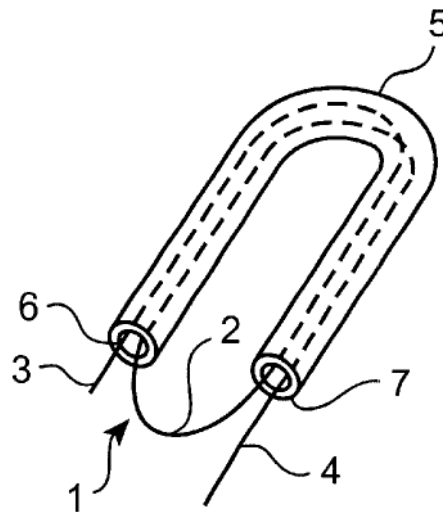
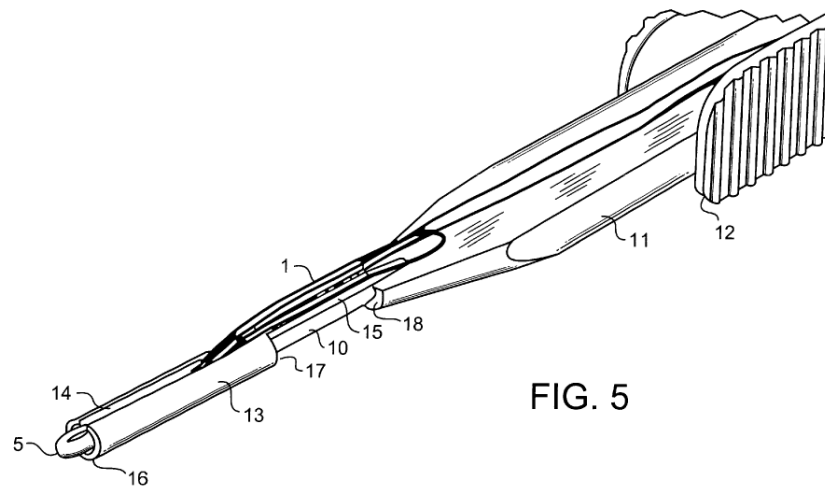


FIG. 1

Figure 1 of Fumex, above, “shows the anchoring device of the present invention, which comprises a suture thread (1) forming, in its middle part, a closed loop (2) which is capable of being tightened by simple traction on one of the two strands (3, 4) of the thread (1).” *Id.* at 5:39–43. Figure 1 further shows that the “[t]he thread (1) forming the loop (2) passes into the sleeve (5) via its end (6), emerges via the other end (7), once again enters via the

end (6) and emerges via the end (7) in such a way as to form a complete loop in the sleeve.” *Id.* at 5:44–47.

Figure 5 of Fumex, reproduced below, depicts “a perspective view of an ancillary instrument permitting semi-automatic positioning of an anchoring device.” *Id.* at 5:32–34.



As shown in Figure 5, “the ancillary instrument comprises a rod (10) intended to support the loop of the suture thread (1) in the sleeve (5), via the center of its loop (2), to ensure its positioning in the hole bored in the bone (not shown).” *Id.* at 6:50–57. Fumex describes operation of the instrument to insert the sleeve as follows:

After the hole has been bored in the bone using a conventional instrument, the rod (10) bearing the loop-shaped thread (1) and the sleeve (5) is introduced into the hole in such a way that the distal edge (16) abuts against the bone, at the edge of the hole. The rod (10) is then inserted, which results in the sliding of the cylindrical element (13) along the rib (15) until the proximal edge (17) of the cylindrical element (13) comes to bear against the shoulder (18) situated at the base of the rod (10). The sliding distance is determined so as to correspond to the depth of the hole bored in the bone. In this

position, the sleeve (5) is entirely inserted in the hole bored in the bone.

Id. at 6:64–7:8.

2. *Grafton (Ex. 1005)*

Grafton is a U.S. patent publication that teaches “high strength surgical suture materials, and more particularly . . . braided suture blends of ultrahigh molecular weight polyethylene and polyester having high strength and excellent tie down characteristics.” Ex. 1005 ¶ 2. Grafton teaches that the “preferred suture includes a multifilament cover formed of a plurality of fibers of ultrahigh molecular weight polyethylene braided with fibers of polyester. The cover surrounds a core of twisted fibers of ultrahigh molecular weight polyethylene.” *Id.* ¶ 6.

3. *Bonutti '395 (Ex. 1006)*

Bonutti '395 is a U.S. patent publication that teaches a “method of securing sections of a fractured bone.” Ex. 1006, 1:36–40. “Sections of a fractured bone are held against movement relative to each other by a force transmitting member, such as a suture, which extends through a passage in the bone.” *Id.*

Figure 5 of Bonutti '395, reproduced below, depicts “the manner in which a suture extends between suture anchors through a nonlinear passage.” *Id.* at 2:8–10.

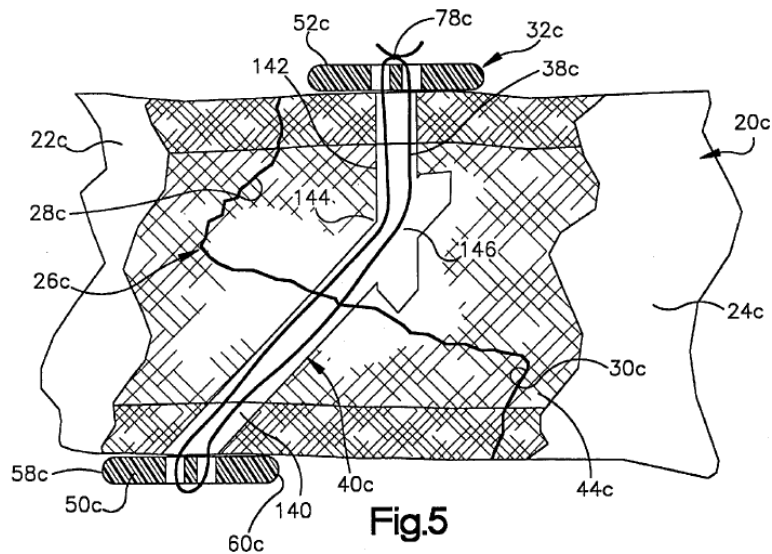


Figure 5, above, shows a situation where “suture 38c is disposed in a passage 40c having a nonlinear configuration. . . . The flexible suture 38c extends around the bend 144 along a nonlinear path between the suture anchors 50c and 52c.” *Id.* at 10:41–48. Bonutti ’395 teaches that to position the suture in the nonlinear passage, a “flexible pusher member applies force against the trailing end 60c of the anchor 50c and pushes the anchor around the bend . . . of the passage 40c.” *Id.* at 11:27–30.

4. *Bonutti ’875 (Ex. 1007)*

Bonutti ’875 is a U.S. patent that teaches “surgical devices such as implants or suture fastenings.” Ex. 1007, 1:18–19. Bonutti ’875 teaches “heat bonded fastenings for sutures or K-wires, in which a variety of different suture anchors are usable, including expandable distal suture anchors.” *Id.* at 2:2–5.

Bonutti '875 teaches that it may be

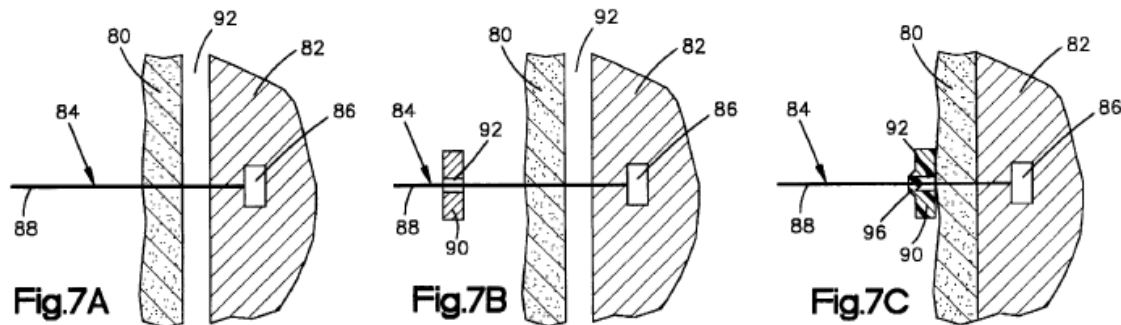
difficult to tie a suture knot to itself or to slide it down through deep tissue in a limited working area . . . [and that] mechanical tying or crimping of sutures or K-wires, especially of polymers or biodegradables which are generally smooth, does not produce connections which are as strong as desirable, and suture connections sometimes may come untied as a result.

Id. at 6:47–57. Accordingly, Bonutti '875's "suture fastenings are easier to form and stronger than conventional tied knots." *Id.* Bonutti '875 teaches an embodiment where "surgical connections for holding adjoining tissues together are secured by melting a fastener or anchor on the end of a suture, rather than by tying or by clipping the anchor on the end of the suture." *Id.* at 6:59–62. Bonutti '875 teaches that advantages of heat bonded fastenings include that

a melted anchor provides a stronger bond than the mechanical interlock of a suture knot, because it will not unravel or come apart as a surgical knot may. It takes less time to fasten than it does to tie a suitable knot. There is improved contact between the tissues being joined because of the better suture connection. The straight line suture fastening also avoids buckling of the tissue edges caused by force vectors not extending in the direction of the suture.

Id. at 7:6–13.

Figure 7 of Bonutti '875, reproduced below, depicts a bonded suture fastening:



Bonutti '875 states:

As illustrated in FIG. 7, two pieces of tissue 80 and 82 are to be joined using a suture 84. A distal anchor 86 is located on the end of the suture 84. The suture is then inserted through the tissues 82 and 80 so that a free end 88 of the suture 84 protrudes at the proximal end. A fastener 90 having an opening 92 therein is slid over the wire 84 and pulled down tight as shown in FIG. 7C to close the gap 94 between the tissues 80 and 82.

The fastener 90 is made of a heat bondable plastic material. (The suture can also be made of heat bondable plastic material which is bonded to secure the connection.) The fastener 90 is then bonded at an area 96 to the protruding free end 88 of the suture 84. In FIG. 7C, it can be seen that the fastener 90 is bonded to the suture 84 without significant deformation of the suture.

Ex. 1007, 7:37–51.

5. *Bonutti '717 (Ex. 1016)*

Bonutti '717 is a U.S. patent that relates to suture anchors formed from material that absorbs body liquid. Ex. 1016, code (54), 1:23–25, 2:45–53. As the material expands, “an improved interlock is formed between the anchor and body tissue.” *Id.* at 2:50–52. Bonutti '717 explains that a suture extends from the anchor. *Id.* at 1:24–25.

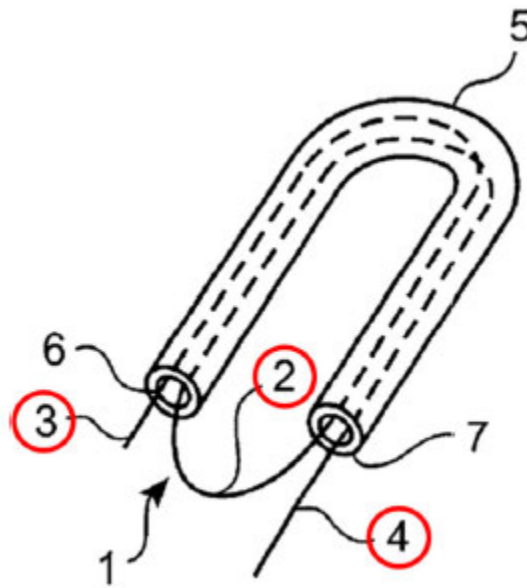
Bonutti '717 also describes an inserter assembly for positioning the suture anchor in body tissue. *Id.* at 12:45–64, Fig. 11.

E. Ground 1: Alleged Anticipation

Petitioner argues that Fumex anticipates claims 8, 11, 13, 14, 16, and 18–20. Pet. 23–38. Patent Owner does not challenge Petitioner's arguments that Fumex anticipates claims 8, 11, 13, 14, 16, and 18. *See* PO Resp. 1–2. Instead, Patent Owner argues only that Fumex does not anticipate dependent claims 19 and 20, which recite that the claimed hollow fastener is “knotless.” *See id.*

We find on the full trial record that Petitioner demonstrates by a preponderance of the evidence that Fumex anticipates claims 8, 11, 13, 14, 16, and 18, for the reasons discussed in the Petition and in Dr. Jordan's Declaration. *See* Pet. 23–36; Ex. 1002 (Jordan Decl.) ¶¶ 91–108. We adopt this reasoning as our own.

We also find on the full trial record that Fumex anticipates claims 19 and 20, for the reasons discussed in the Petition and in Dr. Jordan's Declaration. *See* Pet. 37–38; Ex. 1002 (Jordan Decl.) ¶¶ 111–15. To explain, we reproduce below Petitioner's annotated version of Fumex's Figure 1:



Pet. 38. Petitioner’s annotated version of Fumex’s Figure 1 shows tubular sleeve 5 with a suture looped through it. Petitioner highlights suture ends 3, 4 and suture loop 2. *Id.* Petitioner explains that “[t]he suture is passed through the tubular sleeve such that loop 2 is formed,” but “neither strand 3, 4 extending from the sleeve is passed through the loop to form a knot.” *Id.* at 37 (citing Ex. 1004 (Fumex), 5:38–57, Fig. 1; Ex. 1002 (Jordan Decl.) ¶¶ 112–13). “Instead, the sleeve is deformed into a ball by ‘exerting a traction on the strands of the thread in diverging directions,’ anchoring the suture to bone.” *Id.* (quoting Ex. 1004 (Fumex), 5:38–57; citing *id.* at 3:7–17, 5:38–57 (tensioning the suture causes “compression of the sleeve, whose surface forms undulations because of the compressibility of the material from which it is made”), 6:7–16 (“sleeve (5) is deformed until it adopts the shape of a ball” that is “unable to come out of the hole through which it has been introduced”)). As Dr. Jordan explains, “[i]t is the deformation of the fastener into a ball shape that secures the fastener, not the tying of a knot.” Ex. 1002 (Jordan Decl.) ¶ 112.

Patent Owner argues that “Fumex does not disclose a flexible hollow fastener that is ‘knotless’ as Patent Owner and Dr. Pedowitz have construed this term in this Proceeding.” PO Resp. 20; Ex. 2001 (Pedowitz Decl.)

¶¶ 37, 41, 59, 60, 62. Patent Owner explains that “[u]nder [its] claim construction, Fumex’s suture anchor is knotted because it has looping of a cord (e.g., suture) drawn tight into a knob or lump (e.g., a ball) for fastening the cord to something else (e.g., the sleeve) according to the definition of a knot.” PO Resp. 20–21 (citing Ex. 1004 (Fumex), 5:44–47; Ex. 2001 (Pedowitz Decl.) ¶ 59¹⁹).

Patent Owner also argues that “Dr. Jordan’s testimony is consistent with the Fumex bone anchor being a knotted fastener,” because Dr. Jordan referred to Fumex as forming a “knot.” *See id.* at 21. Specifically, Patent Owner argues that “Dr. Jordan testified that by deforming Fumex’s bone anchor to the second configuration by sliding the suture within the limits of the closed loop, there will be ‘a bigger **knot**’ closer to the cortical bone,” as follows:

Q: What does it mean to be “able to slide on the threads within the limits of the loop?”

A: So the sleeve that’s around the looped thread is able to slide. In other words, you can hold one thread and pull the other, and it deforms it. So it slides on it. It bunches up. As it bunches up, because mass doesn’t change, it won’t be as far down but it will be **a bigger knot** closer to the cortical bone, so it changes its configuration. And the way to do that is, it slides on the loop as you pull one of the limbs.

¹⁹ Patent Owner also cites “Ex 2001, ¶ 86,” but this citation is unclear because Dr. Pedowitz’s Declaration does not contain a paragraph numbered 86. PO Resp. 20–21.

PO Resp. 21 (quoting Ex. 2002 (Jordan Depo. Tr.), 19:21–20:8) (emphasis Patent Owner’s). Patent Owner argues that “Dr. Jordan’s testimony is consistent with the Fumex bone anchor being a knotted fastener.” *Id.* (citing Ex. 2001 (Pedowitz Decl.) ¶ 60).

In accordance with our construction of the term “knotless” fastener, we agree with Petitioner that because Fumex’s sleeve can be retained in place without tying a knot at the site where it is secured in place, Fumex discloses a “knotless” fastener as recited in claims 19 and 20. *See* Pet. 37–38; Ex. 1002 (Jordan Decl.) ¶¶ 111–15. We adopt Petitioner and Dr. Jordan’s reasoning as our own. *See id.*

We note that Patent Owner does not dispute that a knot is *not* tied in connection with securing Fumex’s fastener.²⁰ *See, e.g.,* Sur-reply 21 (arguing that “Fumex’s bone anchor retains the anchor in place in bone – not by **tying** a knot – but by forming a knot by **pulling on one or both strands of the suture**”). Instead, Patent Owner’s argument for why Fumex fails to teach a “knotless” fastener is based on its proposed claim construction. *See* PO Resp. 20 (“Fumex does not disclose a flexible hollow fastener that is ‘knotless’ as Patent Owner and Dr. Pedowitz have construed this term in this Proceeding.”); Sur-reply 1 (“It is undisputed that the claim construction of a ‘knotless’ fastener will decide this case.”),²³ (“If Patent Owner’s construction of “knotless” fastener is adopted, then claims 19 and 20 of the

²⁰ In this regard, although Dr. Jordan referred to a “bigger knot” when discussing Fumex, he did not describe Fumex as requiring **tying** of a knot. *See* Ex. 2002 (Jordan Depo. Tr.), 19:21–20:8. Our construction requires elimination of knot-**tying**; it does not encompass the elimination of any structure that could be considered a “knot” in the general sense of the word. *See* Reply 21 n.6; Tr. 16:10–17:10.

‘453 Patent are not anticipated by Fumex, which fails to disclose a knotless fastener.”); *see also* Reply 21 (asserting that “Patent Owner has not disputed that Fumex meets Petitioner’s proposed construction of ‘knotless.’”).

Because we reject Patent Owner’s proposed construction of “knotless” (*see supra* Section II.C.2), Patent Owner’s argument that Fumex fails to teach a “knotless” fastener is unavailing.

In sum, for the reasons discussed above, we determine that Petitioner has shown by a preponderance of the evidence that Fumex anticipates claims 8, 11, 13, 14, 16, and 18–20.

F. Ground 2 – Alleged Obviousness Over Fumex

Petitioner asserts that claims 1, 3, 4, 6–11, 13–16, and 18–20 are unpatentable as obvious over Fumex. *See* Pet. 38–58. Patent Owner does not challenge Petitioner’s arguments that Fumex would have rendered claims 1, 4, 6–11, 13–16, and 18 obvious. *See* PO Resp. 1–2. Instead, Patent Owner argues only that Fumex would not have rendered dependent claims 3, 19, and 20 obvious.

On the full trial record, we find that Petitioner establishes by a preponderance of the evidence that claims 1, 3, 4, 6–11, 13–16, and 18–20 are unpatentable as obvious over Fumex. *See* Pet. 38–58; Ex. 1002 (Jordan Decl.) ¶¶ 116–62. We adopt Petitioner and Dr. Jordan’s reasoning as our own.

Turning to Patent Owner’s arguments, Patent Owner first argues that Fumex would not have rendered dependent claims 3, 19 and 20 obvious given that Fumex allegedly fails to teach or suggest the “knotless” limitation recited in these claims. *See* PO Resp. 1–2, 22. As discussed above in

connection with our anticipation analysis, Patent Owner's argument is unavailing. *See supra* Section II.E.

Patent Owner also argues that Fumex would not have rendered claim 3 obvious because Fumex does not teach limitation [1.3] of claim 1 (from which claim 3 depends). *See* PO Resp. 23. Claim limitation [1.3] recites "wherein at least a portion of the suture is fabricated with polyethylene." *See* Ex. 1001, 27:27–28.

In the Petition, for limitation [1.3], Petitioner concedes that "Fumex does not expressly disclose polyethylene suture." Pet. 42. Nevertheless, Petitioner argues that a person of ordinary skill in the art would have had reasons to use a polyethylene suture with Fumex's sleeve, including because it was a known, commercially available material of the type (i.e., non-absorbable suture threads) disclosed in Fumex, and because a person of ordinary skill in the art would have known that the strength of a braided polyethylene suture would have been beneficial in certain surgical procedures, e.g., where a strong repair was needed, where the tissues being repaired were dense, or where a weight-bearing joint was involved. *See id.* (citing, e.g., Ex. 1004 (Fumex), 2:46–48 (teaching use of non-absorbable suture thread)), 44; Ex. 1002 (Jordan Decl.) ¶¶ 127–33).

Patent Owner acknowledges that "Fumex discloses two species of thread materials – polyester and polyamide," but argues that "[n]either of these species would have taught or suggested polyethylene to a POSITA." PO Resp. 23 (citing Ex. 2001 (Pedowitz Decl.) ¶ 70; *Eli Lilly & Co. v. Barr Labs., Inc.*, 222 F.3d 973, 986 (Fed. Cir. 2000)).

Patent Owner's argument is unavailing. Petitioner provided several persuasive reasons why a person of ordinary skill in the art would have had

reason to use a polyethylene suture with Fumex’s sleeve, including the reasons summarized above. *See also* Pet. 42–45; Ex. 1002 (Jordan Decl.) ¶¶ 127–33. Patent Owner’s argument “is limited to the express teachings of Fumex, and does not address the obviousness of using a suture that comprises polyethylene in the Fumex system.” Reply 22. We agree with Petitioner that Patent Owner did not address, let alone undermine, the rationales Petitioner presented in the Petition. *See* Reply 22–23.

On Sur-reply, Patent Owner for the first time argues that a person of ordinary skill in the art would not have assumed that polyethylene sutures would be effective with the Fumex fastener, because they are purportedly “much more slippery than standard sutures.” Sur-reply 23 (citing Ex. 1018 (Pedowitz Depo. Tr.), 89:14–25, 90:14–91:14). Because Patent Owner did not make this argument in its Patent Owner Response such that Petitioner had an opportunity to respond to it in the Reply, it is untimely and forfeited. *See, e.g.,* Inst. Dec. 28; *Ford Motor Co.*, IPR2022-00086, Paper 25 at 85.

In sum, for the reasons discussed above, we determine that Petitioner has shown by a preponderance of the evidence that claims 1, 3, 4, 6–11, 13–16, and 18–20 are unpatentable as obvious over Fumex.

G. Ground 3 – Alleged Obviousness Over Fumex and Grafton

Petitioner asserts that claims 1–4, 6, 9, 10, and 15 would have been obvious over Fumex and Grafton. Pet. 52–59. In brief, Petitioner concedes that Fumex does not expressly disclose a polyethylene suture, but asserts that it does teach the use of any non-absorbable suture thread. *Id.* at 53 (citing Ex. 1004 (Fumex), 2:46–48; Ex. 1002 (Jordan Decl.) ¶ 164). Petitioner cites Grafton’s description of a suture that includes braided strands of polyethylene and polyester, and asserts that a person of ordinary

skill in the art would have chosen such a suture for applications requiring a relatively high suture strength. *See id.* at 53–55 (citing, e.g., Ex. 1005 (Grafton), Abstr., ¶¶ 5, 6, Fig. 1; Ex. 1002 (Jordan Decl.) ¶¶ 164–65, 167–69).

Patent Owner does not dispute Petitioner’s contentions regarding the obviousness of claims 1, 2, 4, 6, 9, 10, and 15 in view of Fumex and Grafton. *See* PO Resp. 24. Instead, Patent Owner argues only that, with respect to claim 3, “Grafton does not suggest a cure for the deficiency of Fumex with respect to its lack of a ‘knotless’ fastener.” *Id.* This argument is unavailing, because Petitioner does not rely on Grafton as teaching or suggesting the “knotless” limitation. *See generally* Pet. 52–59.

We find on the full trial record that Petitioner demonstrates by a preponderance of the evidence that claims 1–4, 6, 9, 10, and 15 are unpatentable as obvious over Fumex and Grafton, for the reasons discussed in the Petition and in Dr. Jordan’s Declaration. *See* Pet. 52–59; Ex. 1002 (Jordan Decl.) ¶¶ 164–80. We adopt this reasoning as our own.

H. Ground 6 – Alleged Obviousness Over Fumex and Bonutti ’875

For Ground 6, Petitioner asserts that claims 3, 19, and 20 are unpatentable as obvious over Fumex and Bonutti ’875. Pet. 66–73. Petitioner presents this Ground in the event Patent Owner argues “that use of a knot *anywhere* in the system would preclude *the fastener* from being ‘knotless.’” *Id.* at 67. Patent Owner responds that it “does not make such an argument so Ground 6 is moot.” PO Resp. 24.

We need not reach this Ground, because Petitioner offered it contingent on an argument Patent Owner did not make. Additionally, we have already found claim 3 unpatentable under Grounds 2 and 3, and claims

19 and 20 unpatentable under Grounds 1 and 2, and thus need not reach this alternative ground for this additional reason. *See SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1359 (2018) (holding that a petitioner “is entitled to a final written decision addressing all of the claims it has challenged”); *Bos. Sci. Scimed, Inc. v. Cook Grp. Inc.*, 809 F. App’x 984, 990 (Fed. Cir. 2020) (nonprecedential) (recognizing that the “Board need not address issues that are not necessary to the resolution of the proceeding” and, thus, agreeing that the Board has “discretion to decline to decide additional instituted grounds once the petitioner has prevailed on all its challenged claims”).

I. Grounds 4, 5, 7, 8

For Ground 4, Petitioner asserts that claims 5, 12, and 17 are unpatentable as obvious over Fumex and Bonutti ’395. Pet. 60–65. In brief, these claims recite that the pushrod is flexible. Petitioner asserts that “[w]hile Fumex contemplates bone hole shapes beyond simple straight passages, Fumex does not expressly state that the rod is flexible.” Pet. 61 (citing, e.g., Ex. 1004 (Fumex), 2:1–8, 6:64–65). Petitioner asserts that “flexible pushrods were known,” such as the flexible pusher member disclosed in Bonutti ’395, and that a person of ordinary skill in the art would have used such a flexible rod in surgical applications in which the bone or tissue passage was not linear. *Id.* (citing, e.g., Ex. 1006 (Bonutti ’395), 1:20–22, 10:23–12:8; Ex. 1002 (Jordan Decl.) ¶¶ 183–85).

For Ground 5, Petitioner asserts that dependent claim 5 is unpatentable as obvious over Fumex, Grafton, and Bonutti ’395. Pet. 66. Like Ground 4 discussed above, this Ground relies on Bonutti ’395 for its disclosure of a flexible pushrod. *Id.* It also relies on Grafton for its teaching

of the limitation, recited in independent claim 1, of a polyethylene suture. *Id.*; Ex. 1002 (Jordan Decl.) ¶¶ 197–99.

For Ground 7, Petitioner asserts that claims 1 and 7 are unpatentable as obvious over Bonutti '717 and Fumex. Pet. 74–81. According to Petitioner, Bonutti '717 “describes an inserter assembly for expandable suture anchors,” which “generally works by ejecting suture anchors into body tissue, where the anchor expands to secure itself in place.” *Id.* at 76 (citing Ex. 1016 (Bonutti '717), 1:24–26, 2:45–48, 13:14–36, Fig. 11; Ex. 1002 (Jordan Decl.) ¶ 222). Petitioner asserts that a person of ordinary skill in the art would have recognized that Fumex’s flexible sleeve is another expandable suture anchor that could be delivered by Bonutti '717’s inserter assembly, and that using Fumex’s sleeve would have been a simple design choice. *Id.*; Ex. 1002 (Jordan Decl.) ¶¶ 223–24. With regard to the limitation of claim 7 reciting that “the distal portion of the introducer is configured to penetrate an imperforate surface of the body,” Petitioner cites Bonutti '717 teaching that the inserter has a pointed tip “to form an opening in an imperforate outer side surface 114f of the patient’s body tissue 22f.” Pet. 80 (quoting Ex. 1016 (Bonutti '717), 13:3–26; citing *id.* at Fig. 11; Ex. 1002 (Jordan Decl.) ¶ 238).

For Ground 8, Petitioner asserts that claims 1 and 7 would have been obvious over Bonutti '717, Fumex, and Grafton. Pet. 81. Petitioner relies on its arguments for Ground 7, and additionally cites its arguments from Ground 3, which incorporate Grafton’s teaching of using a braided polyethylene/polyester suture. *Id.*; Ex. 1002 (Jordan Decl.) ¶¶ 239–40.

In its Patent Owner Response, Patent Owner did not address any of claims 1, 2, and 4–18. *See* PO Resp. 1 (“In an effort to reduce the issues for

consideration by the Board, claims 1–2 and 4–18 are not being addressed in the Patent Owner’s Response.”).

We are persuaded on the full trial record that Petitioner has shown by a preponderance of the evidence that claims 1, 2, and 4–18 are unpatentable as obvious, for the reasons discussed in the Petition and in Dr. Jordan’s Declaration with respect to Grounds 4, 5, 7, 8. *See* Pet. 60–66, 74–81; Ex. 1002 (Jordan Decl.) ¶¶ 181–99, 218–40. We adopt Petitioner’s and Dr. Jordan’s reasoning as our own.

III. CONCLUSION²¹

Based on the full trial record, we conclude that Petitioner has demonstrated by a preponderance of the evidence that claims 1–20 are unpatentable.

In summary:

Claim(s)	35 U.S.C. §	Reference(s)/ Basis	Claim(s) Shown Unpatentable	Claim(s) Not Shown Unpatentable
8, 11, 13, 14, 16, 18–20	102	Fumex	8, 11, 13, 14, 16, 18–20	
1, 3, 4, 6–11, 13–16, 18–20	103	Fumex	1, 3, 4, 6–11, 13–16, 18–20	

²¹ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this Decision, we draw Patent Owner’s attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. *See* 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. §§ 42.8(a)(3), (b)(2).

Claim(s)	35 U.S.C. §	Reference(s)/ Basis	Claim(s) Shown Unpatentable	Claim(s) Not Shown Unpatentable
1–4, 6, 9, 10, 15	103	Fumex, Grafton	1–4, 6, 9, 10, 15	
5, 12, 17	103	Fumex, Bonutti '395	5, 12, 17	
5	103	Fumex, Grafton, Bonutti '395	5	
3, 19, 20	103	Fumex, Bonutti '875 ²²		
1, 7	103	Bonutti '717, Fumex	1, 7	
1, 7	103	Bonutti '717, Fumex, Grafton	1, 7	
Overall Outcome			1–20	

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Petitioner has demonstrated by a preponderance of the evidence that claims 1–20 of U.S. Patent No. 9,814,453 B2 are unpatentable; and

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

²² As explained above (*see supra* Section II.H), we do not reach this ground.

IPR2022-01043
Patent No. 9,814,453 B2

For PETITIONER:

Megan S. Woodworth
Justin J. Oliver
Robert E. Bugg
VENABLE LLP
mswoodworth@venable.com
joliver@venable.com
rebugg@venable.com

For PATENT OWNER:

Robert M. Evans, Jr.
Michael J. Hartley
Kathleen Markowski Petrillo
LEWIS RICE LLC
revans@lewisrice.com
mhartley@lewisrice.com
kpetrillo@lewisrice.com