

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

STRAUMANN USA, LLC,
Petitioner,

v.

SMART DENTURE CONVERSIONS, LLC,
Patent Owner.

IPR2025-00956
Patent 11,937,992 B1

Before MICHAEL J. FITZPATRICK, ERIC C. JESCHKE, and
RYAN H. FLAX, *Administrative Patent Judges*.

FLAX, *Administrative Patent Judge*.

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

I. INTRODUCTION

Smart Denture Conversions, LLC (“Patent Owner”) is the owner of U.S. Patent 11,937,992 B1 (Ex. 1001, “the ’992 patent”). Paper 5, 1 (Patent Owner Mandatory Notices). On April 30, 2025, Straumann USA, LLC (“Petitioner”) filed a Petition for *inter partes* review challenging the patentability of claims 1–12 of the ’992 patent. Paper 2, 1 (“Pet.”). On August 29, 2025, Patent Owner filed a Preliminary Response to the Petition. Paper 9 (“Prelim. Resp.”). Patent Owner requested discretionary denial (Paper 8); however, on September 19, 2025, the Acting Director referred the case to the Board. Paper 11.

Under 37 C.F.R. § 42.4(a), we have authority to determine whether to institute trial in an *inter partes* review. We institute an *inter partes* review only if the information presented in the petition filed under 35 U.S.C. § 311, and any preliminary response filed under § 313, shows that there is a reasonable likelihood that Petitioner would prevail with respect to at least one of the claims challenged in the petition. 35 U.S.C. § 314.

After reviewing the parties’ submissions in view of the existing record, we conclude that Petitioner demonstrates a reasonable likelihood it would prevail in showing that at least one challenged claim of the ’992 patent is unpatentable under the presented grounds. *See* Pet. Therefore, we *grant* institution of *inter partes* review. Our reasoning is discussed below.

A. REAL PARTIES-IN-INTEREST

Petitioner states that “[t]he real parties-in-interest are Petitioner Straumann USA, LLC and its affiliates Institut Straumann AG and JJGC Indústria e Comércio de Materiais Dentários S.A.” Pet. 3. Patent Owner

raises no objection and itself identifies “Smart Denture Conversions, LLC is the real party-in-interest.” Paper 5, 2.

B. RELATED MATTERS

Petitioner states, “Smart Denture Conversions, LLC (‘Patent Owner’) sued Petitioner for alleged infringement of the ’992 patent on April 23, 2024, and served the complaint on June 10, 2024. Patent Owner filed a supplemental complaint on February 4, 2025, alleging infringement of U.S. Patent No. 12,156,781, which issued from a continuation of the ’992 patent. The case is captioned as *Smart Denture Conversions, LLC v. Straumann USA, LLC*, 1:24-cv-00507-JCB (D. Del.).” Pet. 3–4.

Patent Owner identifies the same district court proceeding, and further states:

Also at issue in this matter is related U.S. Patent No. 12,156,781, and Petitioner Straumann USA, LLC has filed a petition for Post-Grant Review of this patent in Post Grant Review Case PGR2025-00054.

U.S. Patent No. 11,937,992 is related to the following patent applications: U.S. Patent Application No. 18/827,656, filed September 6, 2024; U.S. Patent Application No. 18/829,490, issued on June 3, 2025 as U.S. Patent No. 12,318,266; U.S. Patent Application No. 18/424,696 issued as U.S. Patent No. 12,156,781 on December 3, 2024; U.S. Patent Application No. 17/691,108, issued on June 3, 2025 as U.S. Patent No. 12,318,265; and U.S. Patent Application No. 16/596,361, issued on April 26, 2022 as U.S. Patent No. 11,311,354

Paper 5, 2.

C. THE ’992 PATENT AND RELEVANT BACKGROUND

The ’992 patent, titled “SCREW-ATTACHED PICK-UP DENTAL COPING SYSTEM AND METHODS,” issued on March 26, 2024, from

U.S. Application 18/328,730 (“the ’730 application”), which was filed on June 3, 2023. Ex. 1001, codes (10), (21), (22), (45), (54). The ’992 patent indicates priority as follows:

Continuation of application No. 17/691,108, filed on Mar. 9, 2022, and a continuation of application No. 16/596,361, filed on Oct. 8, 2019, now Pat. No. 11,311,354.

Provisional application No. 62/818,082, filed on Mar. 13, 2019, provisional application No. 62/774,402, filed on Dec. 3, 2018, provisional application No. 62/742,942, filed on Oct. 9, 2018.

Id. at codes (60), (63).

The ’992 patent indicates it relates generally to:

A temporary alignment system and method for holding a dental coping to an implant abutment using the same threads in the abutment that are used for definitive attachment are disclosed. The disclosed temporary fasteners initially orient and hold a coping against an abutment with a force along the same axis as the semi-definitive screw. The aligned coping can be picked-up in a closed-tray impression process without unscrewing the temporary fastener. Embodiments include threaded posts that release copings from the abutment through axial forces. Some embodiments include a threaded post with separable cap that is picked-up with the coping. Methods for converting an existing prosthesis for screw attachment to implants in a single visit and digital capture of the converted prosthesis are described.

Id. at Abstr.

Parts of such a system are illustrated at, *inter alia*, Figures 5, 9, and 75, which are reproduced below—for clarity, we annotate these figures to

label reference numbers with the corresponding elements as described in the Specification:

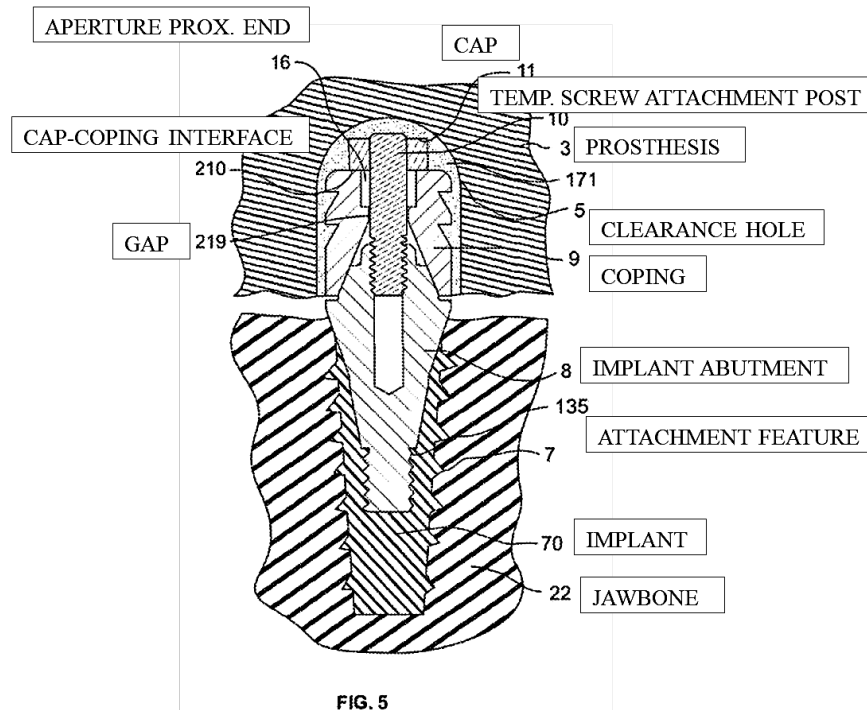


Figure 5 represents a step in a process also represented by Figures 3, 4, and 6–9, and illustrates “a side cross-sectional view of the embodiment of FIG. 4 attached to the jaw and prosthesis prior to the pick-up process.” Ex. 1001, 8:40–42. Figure 5 shows, in cross-section, jawbone 22 in which is embedded implant 70, and there-into-which is embedded implant abutment 8 having attachment feature 135. *Id.* at 12:43–14:64. Above jawbone 22 is prosthesis 3 with clearance hole 5, inside of which is coping 9 and temporary screw having attachment post 10 and cap 11, which meets coping 9 at cap-coping interface 210; the temporary screw is partially inside implant abutment 8, and pick-up material 171 is provided inside clearance hole 5 between prosthesis 3 and coping 9. *Id.* “After the pick-up material 171 has set up, the prosthesis 3, coping 9 and temporary screw cap 10 are

pulled off as an assembly off the patient's jaw." *Id.* at 14:56–58. “The post 10 is subsequently removed to make the abutment threads 18 available for holding the prosthesis in proper alignment with a definitive screw.” *Id.* at 14:62–64.

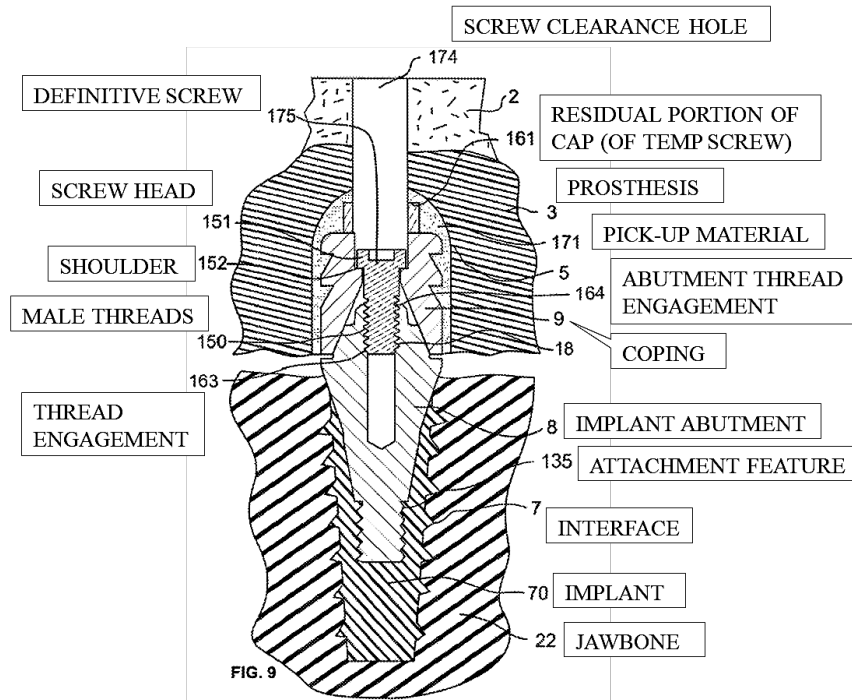
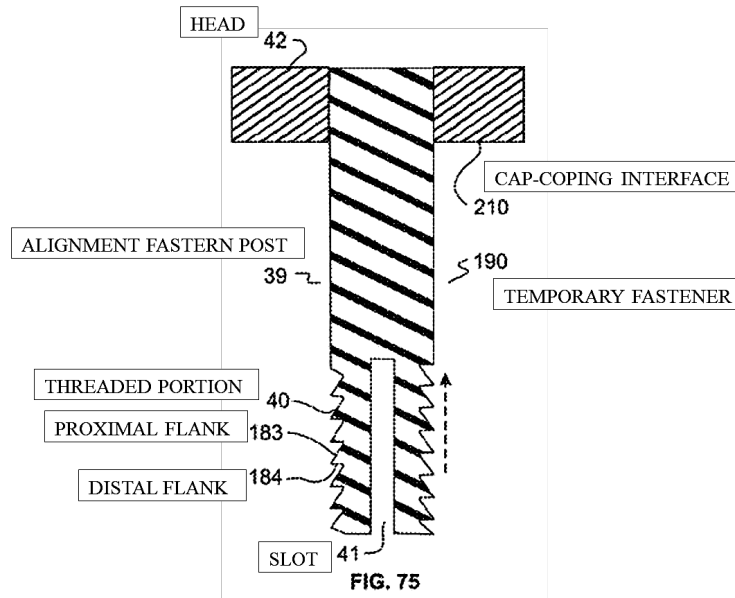


Figure 9 represents a subsequent step in the same process and shows a “side cross-sectional view of the embodiment of FIG. 8 showing the definitive screw holding the prosthesis to the implant.” Ex. 1001, 8:51–53. Figure 9, in addition to showing elements also shown in Figure 5 above, shows temporary screw replaced by definitive screw 175, which is provided in screw clearance hole 174 in prosthesis 3 and residual portion of cap 161 of the temporary screw. *Id.* at 15:23–26. Definitive screw 175 has male threads 150 filling female threads of abutment 8 at thread engagement 163 and abutment thread engagement 164. *Id.* at 15:26–30. Definitive screw

175 has head 151, which is shown abutting shoulder 152 of coping 9. *Id.* at 15:36–46.



Several embodiments of temporary screws are disclosed in the '992 patent and Figure 75 “is a cross-sectional view of a temporary screw embodiment incorporating a split post that has deflecting sections with screw threads shaped to facilitate axial separation without unscrewing the post threads.” Ex. 1001, 11:26–29. Figure 75 shows temporary fastener 190 with alignment fastener post 39, threaded portion 40, and head 42. *Id.* at 23:14–15. Threaded portion 40 has slot 41 and asymmetric threads with proximal flank 183 and distal flank 184. *Id.* at 23:15–18. “[A]s shown in FIG. 75 an alignment fastener post 39 may contain a separable threaded or serrated portion 40 that engages the screw threads in the abutment for pick-up, but that will release with axial force after.” *Id.* at 23:10–14. Further,

This asymmetric threading still allows the temporary attachment post portion 39 to be inserted through rotation like other temporary screw 20 embodiments for alignment for

coping pick-up. The post 39 may be subsequently extracted with a separation force in the axial direction. Although the threads could be designed to provide engagement with the implant abutment threads through axial motion in the opposite direction to the arrow 25 shown in FIG. 75, rotation to a design torque on engagement is generally preferred.

Id. at 23:18–27.

The '992 patent's independent claim 1 is reproduced below:

1. A dental system comprising:

an implant abutment having threads;

a definitive screw having an axis with a length measured along the axis and a width measured perpendicular to the axis, the definitive screw having a proximal head end having a tool interface and a distal post portion having threads configured to engage the threads of the implant abutment;

a coping having a proximal end with an aperture, wherein the aperture is larger than the distal post portion of the definitive screw and smaller than the proximal head end of the definitive screw; and

a temporary screw having an axis with a length measured along the axis and a width measured perpendicular to the axis, the temporary screw comprising:

a proximal head portion with a width larger than the aperture of the coping; and

a distal shaft portion with threads in a pattern that is shaped differently from a pattern of the threads of the definitive screw,

wherein the temporary screw is rotatable in a distal direction whereby the distal shaft portion of the temporary screw engages the threads of the implant abutment to a predetermined torque which causes the proximal head portion of the temporary screw to hold the coping in alignment with the implant abutment, and wherein an axial force in a proximal direction from pick-up processing releases the coping and the temporary screw from the implant abutment.

Id. at 25:36–64. Claims 2–8 and 10–12 each depends directly from independent claims 1 or 9. *Id.* at 25:65–27:26.

D. PETITIONER’S ASSERTED GROUNDS FOR UNPATENTABILITY

Petitioner asserts the following grounds for unpatentability:

Ground	Claims Challenged	35 U.S.C. § ¹	Reference(s)/Basis
1	1–6, 8, 9, 11, 12	102(a)(1)	Kofford ²
2	4, 7, 12	103	Kofford, Poovey ³
3	7, 10	102(a)(1)	Kofford
4	1, 3, 5–7, 9–12	103	Bernhard, ⁴ Poovey, Gracco ⁵
5	4, 8	103	Bernhard, Poovey, Gracco, Derey ⁶
6	2	103	Bernhard, Poovey, Gracco, Ruetschi ⁷

¹ The earliest possible indicated priority date of the ’992 patent is after the relevant AIA revisions to the Patent Act took effect on March 16, 2013. 35 U.S.C. § 100 (note); *see* Ex. 1001, code (60). For the purposes of this Institution Decision, AIA §§ 102 and 103 apply.

² B.D. Kofford and C.A. Rudisill, US 11,311,354 B2, issued Apr. 26, 2022. Ex. 1013 (“Kofford”).

³ J.P. Poovey, US 2016/0045290 A1, pub. Feb. 18, 2016. Ex. 1005 (“Poovey”).

⁴ N. Bernhard et al., US 2017/0202649 A1, pub. July 20, 2017. Ex. 1003 (“Bernhard”).

⁵ A. Gracco et al., *Effects of thread shape on the pullout strength of Miniscrews*, 142(2) AM. J. ORTHOD. & DENTOFACIAL ORTHOP. 186–90 (2012). Ex. 1006 (“Gracco”).

⁶ O. Derey and E. Dorany, WO 2013/030839 A1, pub. Mar. 7, 2013. Ex. 1008 (“Derey”).

⁷ DE 3808238 A1 (Ex. 1021); we cite to the certified English Translation. Ex. 1022 (“Ruetschi”).

Pet. 5–6. In support of these grounds for unpatentability, Petitioner submits, *inter alia*, the Declaration of John B. Brunski, PhD. Ex. 1002. In support of its positions at this stage of the proceeding, Patent Owner submits, *inter alia*, the Declaration of Karl R. Leinsing, MSME, PE. Ex. 2010. The qualifications of these witnesses to testify as to the subject matter of their declarations stand uncontested, on this record.

II. DISCUSSION AND ANALYSIS

A. LEGAL STANDARDS ON PATENTABILITY

“In an [*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) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to 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).⁸

An *inter partes* review may be instituted if the information presented in the petition, in view of the patent owner’s preliminary response and the preliminary record, shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least one of the claims challenged in the petition. 35 U.S.C. § 314.

⁸ At times, we may refer to Patent Owner’s arguments as unpersuasive; however, this is in the context of the record as a whole. We do not shift the ultimate burden from Petitioner.

“[A] prior art reference will anticipate if it ‘disclose[s] each and every element of the claimed invention . . . arranged or combined in the same way as in the claim.’” *Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1341 (Fed. Cir. 2016) (quoting *In re Gleave*, 560 F.3d 1331, 1334 (Fed. Cir. 2009) (alterations by Federal Circuit)). “However, a reference can anticipate a claim even if it ‘d[oes] not expressly spell out’ all the limitations arranged or combined as in the claim, if a person of skill in the art, reading the reference, would ‘at once envisage’ the claimed arrangement or combination.” *Id.* (quoting *Kennametal, Inc. v. Ingersoll Cutting Tool Co.*, 780 F.3d 1376, 1381 (Fed. Cir. 2015) (alteration by Federal Circuit); *In re Petering*, 301 F.2d 676, 681 (CCPA 1962)).

The Supreme Court, in *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398 (2007), reaffirmed the framework for determining obviousness set forth in *Graham v. John Deere Co.*, 383 U.S. 1 (1966). The *KSR* Court summarized the four factual inquiries set forth in *Graham* (383 U.S. at 17–18) that are applied in determining whether a claim is unpatentable as obvious under 35 U.S.C. § 103(a) as follows: (1) determine the scope and content of the prior art; (2) ascertain the differences between the prior art and the claims at issue; (3) resolve the level of ordinary skill in the art;⁹ and (4) consider objective evidence indicating obviousness or non-obviousness.¹⁰ *KSR*, 550 U.S. at 406.

“The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.”

⁹ See *infra* Section II.B.

¹⁰ At this stage of the proceeding, there is no evidence of objective indicia of obviousness or non-obviousness.

Id. at 416. “[W]hen the question is whether a patent claiming the combination of elements of prior art is obvious,” the answer depends on “whether the improvement is more than the predictable use of prior art elements according to their established functions.” *Id.* at 417.

B. ORDINARY SKILL IN THE ART

Petitioner contends:

A person of ordinary skill in the art (POSA), as of both the earliest claimed effective filing date of October 9, 2018 and the actual effective filing date of June 3, 2023, would have at least a bachelor’s degree in mechanical engineering, biomedical engineering, materials science engineering, or an equivalent degree, plus at least five years of experience working with (researching, developing and/or designing) dental implants and prostheses, including familiarity and experience with fasteners (threaded and otherwise) used to connect prostheses, implants and related components. A POSA could also have less formal education but commensurately more practical experience, or vice versa. *Id.*, ¶¶128–130.

Pet. 31 (citing Ex. 1002).

Patent Owner states:

For purposes of this preliminary response, Patent Owner asserts that a POSA would be an individual having a bachelor’s degree in mechanical engineering or equivalent technical degree with a least three years of experience in the field, such as experience with the design of bone implants, anchors, and/or screws. Leinsing Decl. ¶ 35. A person with a higher technical engineering degree and two years of experience in a related field would also qualify as a POSA. A POSA with such qualifications may consult with a dentist, oral surgeon, prosthodontist, or periodontist who has experience with dental implants and prosthetics on patients. Leinsing Decl. ¶ 35.

Prelim. Resp. 14 (citing Ex. 2010).

These two proposed definitions of the ordinarily skilled artisan share many consistencies, for example, the types of degrees and experience such a person would have had, but differ in the number of years of experience. Petitioner proposes the ordinarily skilled artisan would have had *at least five years* of experience and Patent Owner proposes *at least three years* (which would necessarily include five years, too). Patent Owner also proposes that the ordinarily skilled artisan would have *consulted* a dentist, oral surgeon, prosthodontist, or periodontist with experience in dental implants and prosthetics.

At this point, we find little meaningful difference between the two proposed definitions. In fact, neither does Patent Owner's witness, Mr. Leinsing, who states that his "opinions would not change under either definition." Ex. 2011 ¶ 40. Thus, at this stage, we accept and use Petitioner's proposed definition of the ordinarily skilled artisan, which, unlike Patent Owner's, does not implicate reliance on the knowledge of people other than the individual ordinarily skilled artisan. Petitioner's definition appears to comport with the level of skill in the art reflected in the prior art of record and the '992 patent. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) ("the prior art itself [may] reflect[] an appropriate level" of the ordinary level of skill in the art) (quoting *Litton Indus. Prods., Inc. v. Solid State Sys. Corp.*, 755 F.2d 158, 163 (Fed. Cir. 1985)). This parties may further developed this issue at trial, if desired.

C. CLAIM CONSTRUCTION

Our claim construction positions herein are preliminary and for the purpose of clarifying the proceeding. Further argument by the parties is

permitted, but should be explicitly made and set forth in a designated section of briefing, if made.

The Board interprets claim terms in an *inter partes* review using the same claim construction standard that is used to construe patent claims in a civil action in federal district court. 37 C.F.R. § 42.100(b). In construing claims, district courts and the Board here, by default, give claim terms their ordinary and customary meaning, which 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.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc).

The Petition indicates that

None of the claim terms of claims 1–12 needs to be construed to determine the patentability issues presented in this petition. The petition applies the ordinary meaning of the claim language as it would be understood by a POSA after reading the ’992 patent. *Id.*, ¶131. Petitioner will propose a construction if Patent Owner argues or the Board determines that one is required for any term.

Pet. 31–32 (citing Ex. 1002).

Patent Owner presents no express position on claim construction at this point. *See generally* Prelim. Resp.

On this record, we find that the claim language itself, in view of how the terms are discussed in the written description, is sufficiently clear. At this stage of the proceeding, we do not expressly construe any claim terms. If either party intends to argue claim construction at trial, they must do so in a clearly designated section of their briefing and expressly identify such arguments. Claim construction arguments should not be relegated to patentability arguments on the facts.

D. PETITIONER’S ASSERTED PRIOR ART

We review and summarize Petitioner’s asserted prior art references below.

1. Kofford (Ex. 1013)

Petitioner asserts that Kofford is prior art under 35 U.S.C. § 102.

Pet. 15.

Kofford, titled “SCREW-ATTACHED PICK-UP DENTAL COPING SYSTEM AND METHODS,” issued as US 11,311,354 B2 on April 26, 2022, from U.S. Application 16/596,361 (“the ’361 application”), which was filed on October 8, 2019. Ex. 1013, codes (10), (21), (22), (45), (54).

Kofford discloses that its invention relates to the following:

A temporary alignment system and method for holding a dental coping to an implant abutment using the same threads in the abutment that are used for definitive attachment are disclosed. The disclosed temporary fasteners initially orient and hold a coping against an abutment with a force along the same axis as the semi-definitive screw. The aligned coping can be picked-up in a closed-tray impression process without unscrewing the temporary fastener. Embodiments include threaded posts that release copings from the abutment through axial forces. Some embodiments include a threaded post with separable cap that is picked-up with the coping. Methods for converting an existing prosthesis for screw attachment to implants in a single visit and digital capture of the converted prosthesis are described.

Id. at Abstr.

Kofford has the same disclosure as the ’992 patent and is referenced therein for priority purposes. *Compare* Ex. 1001, *with* Ex. 1013 (Kofford) *and* Ex. 1012 (the ’361 application); *see also* Ex. 1001, code (63), 1:7–17.

2. Bernhard (Ex. 1003)

Petitioner asserts that Bernhard is prior art under 35 U.S.C. § 102. Pet. 31. Patent Owner does not dispute that Bernhard is prior art. *See generally* Prelim. Resp.

Bernhard (US 2017/0202649 A1), titled “PROVISIONAL PROSTHETIC SYSTEMS AND METHODS OF USING SAME,” is the July 20, 2017, publication of U.S. Application 15/328,867, which was filed under the PCT on July 24, 2015. Ex. 1003, codes (21), (22), (43), (54).

Bernhard discloses its invention relates to the following:

Provisional prosthetic systems and methods of coupling such provisional prosthetic systems to a dental implant are disclosed. The provisional prosthetic system can include at least one dental component having a provisional connection feature and a prosthesis. A clinician can couple the prosthesis to the dental component using a bonding agent. The clinician can then drill a hole through the prosthesis. The hole can be configured to receive a fastener to securely fasten the prosthesis and dental component to the implant.

Id. at Abstr.

Bernhard discloses a dental system for a prosthetic that includes an abutment implanted into a patient’s jaw, a coping over that abutment and held thereto provisionally via a snap-fit connection, which can be separated by a separation force in a direction away from the abutment, but may also be additionally held by a screw temporarily. *Id.* ¶¶ 66, 76, 82, 105, 126, 130, 135, Figs. 1, 8, 12. A “snap-fit” connection between an abutment and coping “advantageously allow[s] the abutment 120 and other dental component (e.g., coping 130) to be easily removed via application of a separation force,” which “can facilitate preparation of the provisional prosthesis system 100 for final installation to the patient’s jaw.” *Id.* ¶ 75.

3. Poovey (Ex. 1005)

Petitioner asserts that Poovey is prior art under 35 U.S.C. § 102.

Pet. 31. Patent Owner does not dispute that Poovey is prior art. *See generally* Prelim. Resp.

Poovey (US 2016/0045290 A1), titled “DENTAL IMPLANT SYSTEM COMPRISING MEANS FOR PREVENTING ROTATION OF THE SUPERSTRUCTURES AND METHODS OF FORMING AND INSTALLING,” is the February 18, 2016, publication of U.S. Application 14/778,930, which was filed under the PCT on March 21, 2014. Ex. 1005, codes (21), (22), (43), (54).

Poovey discloses its invention relates to the following:

Dental implants for fixed and removable prosthetic devices, having application to single tooth replacement, e.g., caps and crowns, and multiple tooth replacement using one or more implants, e.g., bridges, and multiple implants for full and partial prosthetic devices. Dental implants comprise a non-cylindrical implant and an abutment configured to mate with the implant in a non-rotatable fashion. Further, dental reconstruction and abutment installation methods utilizing the dental implant systems and instruments are disclosed. Also provided are impression taking procedures, and impression copings that produce an accurate fit between the dental prosthesis and the dental implant.

Id. at Abstr.

Poovey discloses temporary screws used during the process of installing dental implants that can have flexible threads or thread coatings that are heat labile plastic or silicone, which can be threaded into an implant to secure coping and then pulled out of the implant without unscrewing and without much force (along with coping) for removal, which improves accuracy of the related impression for the permanent prosthesis, is easier for

the dentist to work with, and more comfortable for the patient. *See id.* at Fig. 13, ¶¶ 21–23, 40, 66–70, 79, 81–84.

4. Gracco (Ex. 1006)

Petitioner asserts that Gracco is prior art under 35 U.S.C. § 102. Pet. 31. Patent Owner does not dispute that Gracco is prior art. *See generally* Prelim. Resp.

Gracco is an article published in 2012 in the American Journal of Orthodontics & Dentofacial Orthopedics, titled “Effects of thread shape on the pullout strength of miniscrews.” Ex. 1006, 186 (we cite to the original pagination of the reference).

Gracco discloses a study, which it summarizes as follows:

Introduction: The aim of this study was to determine the effects of variations in thread shape on the axial pullout strength of orthodontic miniscrews. **Methods:** A total of 35 miniscrews, 7 of each design being considered, were tested by performing pullout tests on a synthetic bone support. We used self-tapping and self-drilling miniscrews having a diameter of 2 mm and a thread shaft length of 12 mm (the longest and the largest supplied by the manufacturer). A buttress reverse thread shape served as the control design and was tested against 4 experimental designs, each manufactured with a modification in thread shape while maintaining all other characteristics. The experimental groups had the following thread designs: buttress, 75° joint profile, rounded, and trapezoidal. **Results:** The control group with a buttress reverse thread shape had consistently higher pullout strength values than did the other designs. A statistically significant reduction in pullout force was found between the buttress reverse and the buttress thread miniscrews. **Conclusions:** Thread design influenced the resistance to pullout of the orthodontic miniscrews. The buttress reverse thread shape provided the greatest pullout strength.

Id. (Abstr.).

Gracco discloses the following types of screw threads for dental miniscrews:

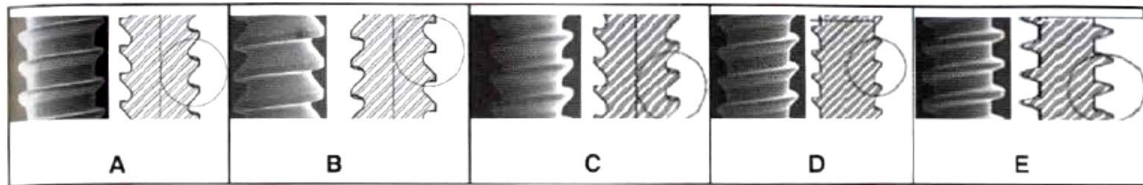


Fig 1. Schematic illustrations of miniscrew thread-designs: **A**, buttress reverse thread shape (control); **B**, buttress thread; **C**, 75° joint profile thread; **D**, rounded thread; **E**, trapezoidal thread.

Id. at 187. Gracco’s Fig. 1, above, shows five types of dental miniscrew threads, including a buttress reverse thread with threads inclined away from the screw’s tip, and also

(1) buttress thread, opposite to the buttress reverse, with thread peaks inclined toward the miniscrew tip (Fig 1, B); (2) 75° joint profile thread, with the threads joining the shaft at an angle of 75' (Fig 1, C); (3) rounded thread, with the thread peaks rounded (Fig 1, D); and (4) trapezoidal thread, with the thread profile trapezoidal (Fig 1, E).

Id.

Gracco discloses “that thread shape affects the miniscrew’s mechanical stability” and “[a] significant reduction in pullout force was found between the buttress reverse and the buttress thread miniscrews. This result could be explained by the geometry of the thread that was inclined toward the tip, thus reducing the resistance to removal in an axial direction.”

Id. at 189.

5. Derey (Ex. 1008)

Petitioner asserts that Derey is prior art under 35 U.S.C. § 102. Pet. 31. Patent Owner does not dispute that Derey is prior art. *See generally* Prelim. Resp.

Derey (WO 2013/030839 A1), titled “A METHOD FOR ATTACHING AND DETACHING DENTAL CONSTRUCTIONS AND A DEVICE THEREOF,” is the March 7, 2013, publication of PCT Application PCT/IL2012/050339, which was filed on August 30, 2012. Ex. 1008, codes (10), (21), (22), (43), (54).

Derey discloses its invention relates to the following:

The present invention relates to a flexible holding device for connecting a construction to an implant in a ridge of a mouth comprising: (a) a head for holding the construction from the inside of said construction; (b) more than one leg for holding the internal thread of said implant from the inside; and (c) a body, attached to said head and attached to said legs, for attaching said construction to said implant.

Id. at Abstr.

6. Ruetschi (Ex. 1021; Ex. 1022)

Petitioner asserts that Ruetschi is prior art under 35 U.S.C. § 102.

Pet. 31. Patent Owner does not dispute that Ruetschi is prior art. *See generally* Prelim. Resp.

Ruetschi (DE 3808238 A1), titled “Screwing tool with torque limiting device,” is the October 27, 1988, publication of German Application DE 8705205.9, which was filed on March 9, 1988. Ex. 1021, codes (11), (22), (43), (54) (we cite to the certified English translation).

Ruetschi discloses its invention relates to the following:

A screw-in tool 1 for surgical applications has a handle 2 for receiving a shaft 3 which is connected to a driver 4 and is rotatably mounted in the handle 2. A device for limiting the tightening torque is provided between the shaft 3 and the handle 2 in the form of a helical spring 5 which is frictionally wound around a portion 31 of the shaft 3 and one end 51 of which is fixedly connected to the handle 2. As a result of the elastic deformation of the helical spring, the static friction between the

handle 2 and the shaft 3 is increased or reduced as a function of the direction of rotation and the torque exerted on the handle 2 and, when a maximum torque is exceeded, changes into a sliding friction between the handle 2 and the shaft 3.

Id. at Abstr.

E. GROUND 1—ASSERTED ANTICIPATION OF CLAIMS 1–6, 8, 9, 11, AND 12 BY KOFFORD

Under Ground 1, Petitioner asserts that Kofford anticipates independent claims 1 and 9, and dependent claims 2–6, 8, 11, and 12. Pet. 44–51 (citing Ex. 1002 ¶¶ 163–239; Ex. 1013, 5:17–28, 5:46–49, 11:21–24, 12:38–46, 13:9–15, 13:40–52, 14:25–26, 14:30–39, 14:65–15:7, 17:42–53, 20:8–24, 20:64–66, 22:9–24, 22:28–41, 22:44–45, 23:67–24:1, Figs. 1, 2, 4–6, 9, 59, 60, 74, 75; Ex. 1015, 296–98, 301).

Petitioner’s challenge under Ground 1 foundationally depends on its assertion that the challenged claims are not entitled to any priority date earlier than the actual filing date of the ’992 patent, i.e., June 3, 2023. *Id.* at 32–43 (citing Ex. 1001, 25:48–55, 25:62–64, 26:7–19, 26:26–28, 26:48–54, 26:65–27:8; Ex. 1002 ¶¶ 136–148, 150, 152–162; Ex. 1006, Fig. 1(A), Ex. 1012, 65, 67, 78, 97, 100, Figs. 9, 75; Ex. 1015, 295–299; Ex. 1017 ¶ 39; Ex. 1019, 4, 5; *Amgen Inc. v. Sanofi*, 598 U.S. 594, 610 (2023); *D Three Enters., LLC v. SunModo Corp.*, 890 F.3d 1042 (Fed. Cir. 2018); *Synthes USA, LLC v. Spinal Kinetics, Inc.*, 734 F.3d 1332, 1344–45 (Fed. Cir. 2013); *Anascape, Ltd. v. Nintendo of Am., Inc.*, 601 F.3d 1333 (Fed. Cir. 2010); *ICU Med., Inc. v. Alaris Medical Sys., Inc.*, 558 F.3d 1368 (Fed. Cir. 2009); *Liebel-Flarsheim Co. v. Medrad, Inc.*, 481 F.3d 1371 (Fed. Cir. 2007); *Tronzo v. Biomet, Inc.*, 156 F.3d 1154 (Fed. Cir. 1998); *Ex parte Gunaratnam*, 2017 Pat. App. LEXIS 10614, *5–8 (PTAB Oct. 26, 2017); *Ex parte Vargas*, 2007 Pat. App. LEXIS 3682, *10–15 (BPAI Sept. 13, 2007);

Ex parte Deacon, 2005 Pat. App. LEXIS 2281, *21–26 (BPAI June 2, 2005)). Only if Petitioner is correct on this priority issue would Kofford, which is cited in the '992 patent for priority purposes, be prior art.

Patent Owner opposes Ground 1 (and Grounds 2 and 3) based on its contention that Kofford is not prior art because the challenged claims are entitled to priority to earlier patent applications pre-dating (and including) Kofford. Prelim. Resp. 30–45 (citing, *inter alia*, Ex. 1001; Ex. 1012, 20, 38, 71–72, 78, 97, 100; Ex. 1002 ¶ 156; Ex. 1015, 32–33, 40, 61, 94, 208–09, 296–97; Ex. 2010 ¶¶ 96–120, 123–131; *Anascape*, 601 F.3d 1333; *Lockwood v. Am. Airlines, Inc.*, 107 F.3d 1565 (Fed. Cir. 1997); *Fujikawa v. Wattanasin*, 93 F.3d 1559 (Fed. Cir. 1996); *Eiselstein v. Frank*, 52 F.3d 1035 (Fed. Cir. 1995); *Ex parte Gunaratnam*, Appeal No. 2016-006720, 2017 WL 5499118, at *1 (PTAB Oct. 26, 2017); *Ex parte Vargas*, Appeal No. 2006-3416, 2007 WL 2823700, at *1 (BPAI Sept. 13, 2007)).

1. Priority¹¹

Petitioner challenges whether any of the '922 patent's claims should be accorded priority to any of (collectively “the priority applications”) U.S. Application 17/691,108 (“the '108 application”), the '361 application,¹² U.S. Provisional Application 62/818,082 (“the '082 provisional”), U.S. Provisional Application 62/774,402 (“the '402 provisional”), and U.S. Provisional Application 62/742,942 (“the '942 provisional”), asserting that

¹¹ For the purposes of this Institution Decision, we focus on independent claim 1 when addressing patentability and address independent claims 1 and 9 when considering the parties' positions on priority.

¹² As noted above, the '361 application issued as Kofford. *See* Ex. 1013, code (21).

none of these prior related applications includes written description support under 35 U.S.C. § 112(a) for the full scope of the following limitations recited by independent claims 1 and 9:

different thread limitations

“a temporary screw . . . with threads in a pattern that is shaped *differently* from a pattern of the threads of the definitive screw” (claim 1);

“a temporary screw. . . comprising: a post comprising male threading, wherein the male threading has a male threading profile that is *different* from the male threading profile of the shaft of the definitive screw” (claim 9);

axial force release limitations

“wherein an *axial force* in a proximal direction from pick-up processing *releases* the coping and the temporary screw from the implant abutment” (claim 1); and

“wherein threads of the male threading of the post *release* from threads of the female threading of the implant abutment with a predetermined *axial pick-up force* in a proximal direction in response to and/or during pick-up processing” (claim 9).

Pet. 32–41 (citing, *inter alia*, Ex. 1001, 25:48–55, 26:48–54, Figs. 9, 75; Ex. 1002 ¶¶ 136–148; Ex. 1006; Ex. 1015, 295–99); *see also id.* at 41–43 (presenting similar arguments specifically directed to dependent claims 3–5, 7, and 10).¹³

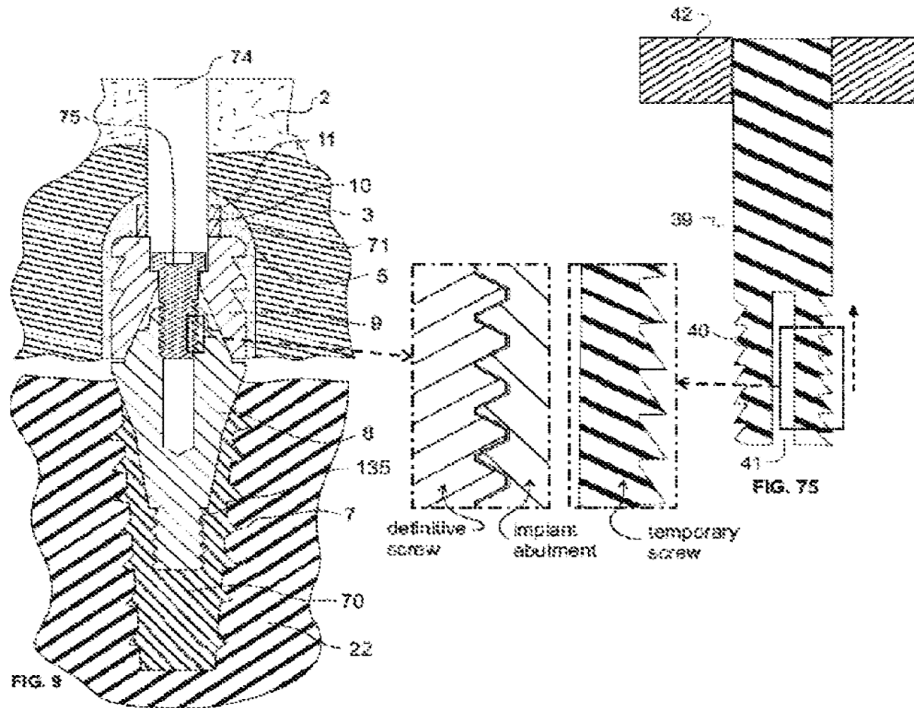
To summarize Petitioner’s positions, regarding the above-labeled *different thread limitations*, Petitioner asserts that these limitations are broad in scope and cover “any difference in the ‘shape’ of the ‘pattern’ (claim 1) or ‘profile’ (claim 9) of the treads of the temporary screw and the definitive

¹³ The Petition also includes a one-sentence argument that the full scope of the independent claims is not enabled; however, we do not analyze that argument in this Decision. *See* Pet. 37.

screw.” *Id.* at 33–37. However, asserts Petitioner, the disclosures of the priority applications (taken cumulatively) describe only one temporary screw embodiment with a different thread pattern/profile compared to the disclosed definitive screw(s)—that is, the embodiment illustrated at Fig. 75 of the ’992 patent (i.e., Fig. 75 of Kofford/the ’361 application and Fig. 43 of the provisional applications) and described in the associated portion of the written Specification. *Id.*

To support its priority argument, Petitioner points to Patent Owner’s positions expressed in prosecuting the ’992 patent—Patent Owner compared the then-application’s Fig. 75’s temporary screw threads to Fig. 9’s definitive screw (the figures are the same in Kofford) to explain to the Examiner how the *different thread patterns* function in the definitive and temporary screws. Pet. 34–35; *see* Ex. 1015, 293–99 (Patent Owner, in remarks in response to a rejection and in support of claim amendments). Petitioner’s point is that Patent Owner previously identified only the very same disclosure in the Specification as Petitioner now identifies as the description of the *different threads* of the definitive and temporary screws. Patent Owner argues that the definitive screw threads (“a continuous symmetrically helical form as is well known to those of skill in the art”) “essentially fill the female abutment threads.” Ex. 1015, 296–99. Patent Owner argued that, although the temporary screw’s threads “can engage the female abutment threads 18 without or with distortion,” as they “fit[] within the profile of the abutment threading” when engaged, “the threading shape is different.” *Id.* Patent Owner argued that the temporary screw thread’s “asymmetric” profile does not fill the abutment’s threads, but leaves “open space” and “has less surface area contact,” and “less material volume within

the engagement depth with the implant abutment.” *Id.* Patent Owner included the below-reproduced drawings in the Office Action Response to illustrate its prosecution points:



The image above shows Fig. 9 (left) and Fig. 75 (right) from the application that issued as the '992 patent (which are also Figs. 9 and 75 of Kofford/the '361 application) and, therebetween, an inset figure enlarging portions of each of Figs. 9 and 75 to show how the symmetrical threads of the definitive screw (labeled) fill the symmetrical threads of the implant abutment (labeled) as compared with the asymmetrical shape of the threads of the temporary screw (labeled), which would not. *Id.* at 296.

And, regarding the *axial force release limitations*, Petitioner makes a similar argument: the claims recite a functional element directed to a relationship between the claimed temporary screw and implant abutment, i.e., the temporary screw releases from the implant abutment via axial force

(it is pulled out), which broadly implicates a variety of screw structures to allow such functionality; however, the Specification (of the '992 patent and Kofford/the '361 application) describes but one relevant structure, i.e., a temporary screw with a split post, as illustrated in Fig. 75. Pet. 37–41 (citing, *inter alia*, Ex. 1001, 25:62–64, 26:65–27:2; Ex. 1002 ¶¶ 143–148; Ex. 1012 at 67, 78, 97, 100, Fig. 75).

Petitioner's argument is that the broad, genus claim limitations (*differently shaped threads* and *axial force release*) are not fully supported by the Specification's disclosure of one species of structures within that genus. Thus, the priority applications' disclosures (which are no more descriptive of these limitations than the Specification of the '992 patent itself) do not satisfy 35 U.S.C. § 112(a) and, therefore, the claims are not entitled to priority to Kofford/the '361 application or any other priority application.

Patent Owner disputes this, taking the position that the priority applications do support the claim limitations at issue and, so, Kofford is not prior art. *See* Prelim. Resp. 30–44.

Regarding the *different thread limitations*, Patent Owner argues that the structure depicted in the '922 patent's and Kofford's/the '361 application's Fig. 75 (and variously as Fig. 43 in the priority applications) is not the only disclosure of a temporary screw (Patent Owner also refers to it as a “fastener”) with a *different* thread than a definitive screw and points to the '361 application's statements that: (1) the disclosed inventive concepts “are not meant to be restricted to a temporary attachment post with standard screws that both engage and disengage the threads in the implant abutment through rotations”; (2) “[a]lternative approaches for engaging a temporary

attachment post with abutment threads through axial insertion without rotation are considered to be part of this disclosure”; (3) an “opposite direction” axial rotation for engaging the temporary screw in the abutment is contemplated; and (4) the temporary screw may have “an interference fit between the bottom of the post with the threads.” *Id.* at 33–37 (citing Ex. 1012, 97, 100). Regarding the *axial force limitations*, Patent Owner again points to the disclosure of “an interference fit” for the temporary screw in the implant abutment. *Id.* at 37–39 (citing Ex. 1012, 97).

We have considered each party’s arguments and the record as presently developed and are, at this point, persuaded by Petitioner’s position.

Upon initial consideration, the concept at issue here creates some cognitive dissonance: a prior related patent/application that is indicted on the face of a challenged patent to be a priority reference is also asserted as prior art against that patent’s claims. However, on closer consideration of the unique facts presented, this circumstance slots congruently into the scenario contemplated by our reviewing court in several decisions, where it confirmed that “[a] disclosure in a parent application that merely renders the later-claimed invention obvious is not sufficient to meet the written description requirement,” i.e., there are different requirements when considering unpatentability over the prior art and written description under 35 U.S.C. § 112. *Tronzo*, 156 F.3d at 1158; *see also Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1352 (Fed. Cir. 2010) (en banc); *Lockwood*, 107 F.3d at 1572. Thus, it is possible for a later-filed application to reference a prior related patent application/patent for priority for its claims, but also for that prior related application/patent to be unavailable for such priority due to insufficient § 112 support for the later claims, and then for

that referenced-priority application/patent to be appropriately asserted as prior art against the later-filed claims. That appears to be the case here based on the present record.

The independent claims recite a temporary screw and a definitive screw where the temporary screw has “threads in a pattern that is *shaped differently* from a pattern of the threads of the definitive screw” (for claim 1, italics added) or where the temporary screw has “a male threading profile that is *different* from the male threading profile of the shaft of the definitive screw” (for claim 9, italics added). Thus, the threads of the claimed temporary screw need only be “different” in pattern or profile compared to the definitive screw. This is a broad concept and provides a generic claim element.

Regarding the *different thread* claim limitations, the Specification of the '992 patent itself, as well as the other preceding applications to which priority is indicated (Exs. 1009–1013), discloses a single embodiment where a temporary screw has threads that are *different* from the threads of a definitive screw, which is illustrated at Fig. 75 (i.e., Fig. 43 in the '942 and '402 provisionals—Ex. 1009 and Ex. 1010 (note, the '082 provisional does not include this figure or discussion)) and described at column 23, lines 3–34 of the '992 patent (Ex. 1001) and pages 39–40 of the '361 application (Ex. 1012, 97–98). Such disclosure describes a temporary screw with asymmetrical, steeply angled (serrated in appearance, i.e., they are generally increasingly wider distally relative to proximally) buttress threads (different from the definitive screws with symmetrical threads). The purpose of this design is so the temporary screw, after being screwed in (rotated axially one way or the other), “may be subsequently extracted with a separation force in

the axial direction,” i.e., pulled out rather than screwed out. Ex. 1001, 23:18–23; Ex. 1012, 97–98. No other *different* temporary screw threads, relative to definitive screw threads, are described.¹⁴ Thus, a single species is described, whereas a larger genus is claimed.

“For a claim in a later-filed application to be entitled to the filing date of an earlier application under 35 U.S.C. § 120 (1994), the earlier application must comply with the written description requirement of 35 U.S.C. § 112, ¶ 1 (1994),” (and AIA § 112(a)). *Tronzo*, 156 F.3d at 1158 (citing *Lockwood*, 107 F.3d at 1571); *see also Dynamic Drinkware*, 800 F.3d at 1378 (discussing requirements for claiming priority to earlier application).

According to Federal Circuit precedent, such as *Tronzo*, 156 F.3d 1154, the requirements for sufficient written description support are more stringent in some respects than those for obviousness (or enablement), meaning that, although a single species disclosed in the prior art falling within a more generic scope of a claim may render that claim obvious (or enabled), (dependent on the facts) disclosure in a specification of only a single species as being the claimed invention will provide written description support (under § 112) for only that single species rather than the

¹⁴ The disclosure of the ’361 application does state that such disclosure is “not meant to be restricted,” mentions the possibility of reversing the threads of the temporary screw (from what is shown in Fig.75) so it is screwed in by rotation in the opposite direction, mentions “[f]urther permutations,” and mentions “an interference fit” between a temporary screw and abutment, but none of these statements actually describes any structures, and certainly not sufficient common structure, to fully describe a representative number of thread types that could be considered *different* per the claim language. Ex. 1012, 96–98, 100; *see Ariad*, 598 F.3d at 1350 (discussing requirements of providing adequate written description support of genus claims).

broader genus. *Id.* at 1158; *see also Ariad*, 598 F.3d at 1352; *Eli Lilly*, 119 F.3d at 1567; *Lockwood*, 107 F.3d at 1571–72; *University of Rochester v. G.D. Searle & Co.*, 358 F.3d 916, 921 (Fed. Cir. 2004) (“[A]n invention may be enabled even though it has not been described.”). So, when a claim limitation is broad and covers a wide range of embodiments, unless the specification is commensurate in scope in its description of such embodiments, it will not provide adequate written description support for that broad limitation under § 112, and such written description support is required for priority purposes for later claims to earlier-filed applications. *Id.* at 1158–60.

Here, the first claim limitation at issue is broad, i.e., *different* thread pattern/profile between a definite and a temporary screw, and the Specification’s and priority applications’ disclosure is narrow and specific, asymmetric buttress style threads in a temporary screw and symmetrical threads in a definite screw (are different). Any apparent predictability in or maturity of the relevant field here must be contrasted with the fact that the Specification, considering the ’992 patent itself or any of the identified priority applications, never once even discusses the (claimed) concept of specifically *differing* the thread style between a temporary and a definitive screw. Any *differences* in thread style are not called out by the disclosure, but are described and can be discerned only in relation to the respective threads’ functionality, i.e., Fig. 75’s temporary screw 190 has buttress-style threading so it can be pulled out rather than unscrewed from the abutment; Fig. 9’s definitive screw 75 has male threads that fill the female threads of the abutment 8 for a secure permanent engagement. Ex. 1001, 15:23–30, 21:25–44, 23:3–36; Ex. 1012, 97–98, Figs. 9, 75.

And, although it is possible for a single disclosed species to provide written description support for a claimed genus, “a sufficient description of a genus . . . requires the disclosure of either a representative number of species falling within the scope of the genus or structural features common to the members of the genus so that one of skill in the art can ‘visualize or recognize’ the members of the genus.” *Ariad*, 598 F.3d at 1350; *see also Synthes USA, LLC v. Spinal Kinetics, Inc.*, 734 F.3d 1332, 1344 (Fed. Cir. 2013). That does not appear to be the case here—the present record does not support that the described asymmetrical buttress, serrated style of *different* temporary screw threading (relative to that of the definitive screw and regardless of the direction of the threads for rotation) is sufficiently representative of the genus’s “different” thread patterns/profiles. *See, e.g.*, Ex. 1006 (a buttress style thread does not function the same as a buttress reverse or 75° joint profile or rounded, or trapezoidal thread).

Petitioner cites *Tronzo* as analogous to the facts presented here. Although there are some differences between the facts presented here and those in *Tronzo*, we find that precedent pertinent on this record.

In *Tronzo*, the Federal Circuit found that a parent patent application cited in an asserted patent for priority reasons did not contain adequate written description of aspects of the claimed invention and, so, the patent was not entitled to priority. *Tronzo*, 156 F.3d at 1157–60. The invention in the *Tronzo* patent was an acetabular cup prosthesis, i.e., a pelvis cup for an artificial hip, and the claims recited that cup, in terms of its shape, generically, without specifically reciting any certain shape. *Id.* at 1156. However, the Federal Circuit found that the parent (priority) application’s specification described only one shape of such a cup—a conical cup (which

could have some variation)—and also distinguished prior art shapes as inferior to the conical shape, which “ma[d]e clear that the [related priority patent] disclose[d] *only* conical shaped cups and nothing broader.” *Id.* at 1159. Because the specification relied upon for priority was so specific, the later claims directed to generic cup shapes were too broad to be supported by the prior specification under 35 U.S.C. § 112 (no written description) or to be accorded priority thereto.

The facts here are very similar to *Tronzo*’s in that only one specific embodiment and structure in the priority applications is arguably disclosed to describe a temporary screw with a *different* thread than a definitive screw—Fig. 75 of the ’992 patent and the ’361 application. It is true that, unlike the facts of *Tronzo*, the priority applications here do not expressly *distinguish* the thread shape of Fig. 75 from other shapes of threads that may be similar to or different from the threads of a definitive screw, other than to identify the temporary screw’s shape as having the advantage of being insertable by screwing-in and removable by pulling-out. *See, e.g.*, Ex. 1012, 97–98. And, it is also true that, here, the priority application’s disclosure makes a reference to one other (reversed) thread pattern and makes a vague reference to an interference fit for a temporary screw, but these are not explained or expanded upon so as to identify any structure that might differ from what is shown in Fig. 75 or be a temporary screw thread *different* from a definitive screw’s thread. *See id.* at 97–98, 100. Moreover, although the claims here are directed to *differences* between the threads of a temporary and a definitive screw, the disclosure of the priority applications never discuss or even allude to this subject, so any description of thread *differences* as claimed can be identified only by first considering the claim language and

then evaluating the specifications to compare the various disclosed screws. Therefore, we find on this record that the facts here are so similar to those of *Tronzo* that the result should be the same.

Under our reviewing court's precedent, on this record we preliminarily find the claims are not supported under 35 U.S.C. § 112(a) by a written description in any priority application and no priority earlier than the '992 patent's actual filing date of June 3, 2023, can be accorded to independent claims 1 and 9. Therefore, Kofford, which was filed on October 8, 2019, and issued on April 26, 2022, is prior art to challenged independent claims 1 and 9.¹⁵

2. Petitioner's Position on Kofford's Anticipation

Petitioner asserts under Ground 1 that claims 1–6, 8, 9, 11, and 12 are anticipated by Kofford because it discloses an embodiment within the scope of the claims. Pet. 44–51 (citing Ex. 1002 ¶¶ 163–239; Ex. 1013, 11:21–24, 12:38–44, 14:65–15:1, 22:32–36, Figs. 1, 2, 4, 5, 9, 75). We focus on independent claim 1 for the purposes of this Decision. All challenged claims should be addressed at trial unless arguments thereover are waived.

Petitioner maps the limitations of independent claim 1 to the disclosure of Kofford. *Id.* at 44–46 (citing Ex. 1002 ¶¶ 166–183; Ex. 1013, 5:24–28, 5:46–49, 11:21–24, 12:38–46, 13:9–15, 13:40–52, 14:25–26, 14:30–36, 14:65–15:7, 22:28–45, 23:67–24:1, Figs. 1, 2, 4–6, 9, 75; Ex. 1015, 296–97). On this record, we find no gaps in Petitioner's identification of each claim limitation in the disclosure of Kofford.

¹⁵ Despite this finding made on the current record, the prior art status of Kofford remains an open issue for trial.

3. Patent Owner's Positions on Ground 1

Patent Owner's single-sentence argument contesting the merits of Petitioner's Ground 1 states, "[b]ecause Kofford is not prior art, Petitioner's anticipation arguments fail." Prelim. Resp. 44. In arguing in support of this position on priority, Patent Owner states that the priority applications, but primarily the '361 application (which is identical to Kofford in its disclosure), "support and enable the claims' scope." Prelim. Resp. 32–33, n.5; *see also* Ex. 1012 (the '361 application) and Ex. 1013 (Kofford); *see also* Ex. 2010 ¶ 93 ("A POSA would understand the Priority Applications, however, to support the full scope of the thread pattern/profile limitations in independent claims 1 and 9. Furthermore, a POSA would understand the Priority Applications to support the full scope of the release limitations in those same claims.").

Under 35 U.S.C. § 112(a), in order for a disclosure to "support and enable" a claim, it must "contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same." As discussed above, the same is required of an application to which priority may be accorded later-filed claims. Thus, Patent Owner necessarily takes the position that Kofford, if supporting and enabling the claims' scope, also discloses the invention of claim 1, which means it would also anticipate the claim. *See Novo Nordisk Pharms, Inc. v. Bio-Tech Gen. Corp.*, 424 F.3d 1347, 1355 (Fed. Cir. 2005) ("In order to anticipate, a prior art disclosure must also be enabling, such that one of ordinary skill in the art could practice the invention without undue experimentation.").

4. Summary

We have considered Petitioner's assertions, Patent Owner's arguments in opposition, and the evidence of record, and find that, on the current record, Petitioner has sufficiently mapped the limitations of independent claim 1 to the disclosure of Kofford, which we preliminarily determine to be prior art to the challenged claims. Based on the evidence presented at this stage of the proceeding, Petitioner has shown under Ground 1 that there is reasonable likelihood in showing that at least one of the '992 patent's claims is anticipated by Kofford. At this point in the proceeding, we focus on independent claim 1, but we institute trial on all challenged claims and all grounds.

F. GROUND 4—ASSERTED OBVIOUSNESS OF CLAIMS 1, 3, 5–7, AND 9–12 OVER BERNHARD, POOVEY, AND GRACCO

Petitioner asserts that claims 1, 3, 5–7, and 9–12 would have been obvious over Bernhard, Poovey, and Gracco and, therefore, are unpatentable. Pet. 54–78 (citing Ex. 1002 ¶¶ 258–350; Ex. 1003 ¶¶ 13, 66, 76, 82, 105, 122, 126, 128–130, 134, 149, 158, 176, Figs. 3, 7A, 8, 12, 26; Ex. 1005 ¶¶ 79, 84, Fig. 13; Ex. 1006, 189, Fig. 1(B)).

Patent Owner contests this. Prelim. Resp. 54–78 (citing Ex. 1005, 12; Ex. 2010 ¶¶ 136–137).

1. Petitioner's Positions

As with Ground 1, we focus on claim 1 for the purposes of this Decision.

Petitioner asserts that the ordinarily skilled artisan would have had reason to combine Bernhard, Poovey, and Gracco (*see* Pet. 54–64 (citing, *inter alia*, Ex. 1002 ¶¶ 262–283)), and asserts that

based on the teachings of Poovey and Gracco, a POSA would have modified the threads of shaft 754 of fastener 750 [of Bernhard] in two respects, so that the temporary screw would provide a stable, reliable and secure connection but still be able to be pulled out without being unscrewed. First, a POSA would have chosen an asymmetric buttress thread, based on Gracco, as discussed above. Second, a POSA would have made or coated the threads with silicone or another flexible plastic to make the threads flexible, based on Poovey, as discussed above. [Ex. 1002] ¶¶277–283.

Pet. 61. To further summarize Petitioner’s position, Bernhard is asserted as teaching dental systems for artificial tooth implants, much like that of the ’992 patent, and teaches that there are advantages to using temporary screws for stability and reliability reasons and advantages for having means for pulling off the temporary coping and temporary fasteners using axial separation force. Pet. 56–57; *see also* Ex. 1003 ¶¶ 66, 75–76, 82 (discussing these concepts). Petitioner asserts that Poovey, also focused on dental systems, teaches that providing the ability to pull out initially conventionally-screwed-in temporary screws in such dental systems is advantageous in enhancing accuracy and patient comfort, and discloses temporary screws engineered with threads for that purpose. Pet. 56–57; *see also* Ex. 1005 ¶¶ 66–71, 78–84 (discussing this concept and the temporary screw). And, Petitioner asserts that Gracco teaches that dental screws can be designed with threads to tailor pull-out strength, particularly asymmetric buttress style threads for engagement at screw-in and having minimal axial force removal requirements. Pet. 57–59; *see also* Ex. 1006, 187 (Fig. 1(B)), 189 (discussing this concept). Petitioner’s position is that it would have been obvious and predictable for the ordinarily skilled artisan to use the engineering concepts from Poovey and Gracco to provide a screw-in/pull-

out temporary fastener for Bernhard's dental system to achieve the desired enhanced accuracy, convenience, and patient comfort, with a reasonable expectation of success. Pet. 54–62.

Petitioner also maps the limitations and elements of independent claim 1 to the disclosures and teachings of Bernhard, Poovey, and Gracco. *Id.* at 62–67 (citing Ex. 1002 ¶¶ 287–306; Ex. 1003 ¶¶ 13, 66, 105, 128–130, 134, 149, 158, 176, Figs. 3, 7A, 8, 12; Ex. 1005 ¶ 84; Ex. 1006). Petitioner identifies that Bernhard teaches a dental system having most of the same components as claimed and used in a similar way as the claimed invention, i.e., it provides an internally threaded implant abutment, coping, and a definitive screw (with threads), and suggests advantages for using a temporary screw with threads (to engage the abutment's threads). *Id.* Petitioner identifies that such a temporary screw used in a similar dental system is taught by Poovey and that Bernhard's system would have been modified to utilize such a temporary screw, that Poovey teaches a screw-in/pull-out temporary screw with flexible threads, and that it would have been obvious to modify such threads per Gracco's teachings to be asymmetrical buttress style threads, i.e., different from the threads of Bernhard's permanent (definitive) screws, to enhance the pull-out functionality of the temporary screws. *Id.*

On this record, we find no gaps in Petitioner's identification of each claim limitation in the combination of Bernhard, Poovey, and Gracco. And, Petitioner has identified a reason with rational underpinning why the ordinarily skilled artisan would have combined this prior art.

2. Patent Owner's Positions

At this point, Patent Owner presents one argument against Petitioner's Ground 4—there would not have been a reasonable expectation of success in combining Bernhard, Poovey, and Gracco. Prelim. Resp. 46–47 (citing Ex. 1005, 12; Ex. 2010 ¶¶ 136–137).

Patent Owner argues that the ordinarily skilled artisan would not have had a reasonable expectation of success because it would be impractical to use Poovey's small screws composed of plastic or silicone for dental implants because such material would impede their insertion. *Id.* Patent Owner also asserts that adding heat to allow screw removal, as taught by Poovey, would be unworkable in a clinical setting and “perhaps even painful for the patient.” *Id.*

Patent Owner's witness, Mr. Leinsing, testifies that the Poovey screw coating may prevent the screws from being inserted because silicone is not rigid enough to easily fit into female threading, comparing the coating to “a gummy worm.” Ex. 2010 ¶ 136. And, Mr. Leinsing testifies that

Applying enough heat to sufficiently degrade or dissolve the thread material or coating through the prosthesis, coping, and/or implant abutment is likely to be inefficient and perhaps even painful for the patient. That is especially true because all temporary screws holding the prosthesis to the abutments would need to be heated simultaneously to successfully carry out pick-up processing. Finally, Poovey does not teach how one could degrade or melt the threading or thread coating and then “remov[e] any residual material in the abutment threads or in the prosthesis after the pick-up process.” EX1001, at 4:21–23.

Id. ¶ 137.

At this point and on this preliminary record, we are not persuaded by these arguments.

First, Patent Owner's arguments do not account for Petitioner's proposed combination of prior art where the threads of Poovey's temporary screw would not only be potentially coated with (or made of) some flexible material, but would also be engineered per Gracco's teachings. "Non-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references. . . . [References] must be read, not in isolation, but for what [they] fairly teach[] in combination with the prior art as a whole." *In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986).

Also, Petitioner does not assert that the temporary screw threads must be *made* of silicone, hence akin to a gummy worm as suggested by Mr. Leinsing, but may be *coated* therewith to provide flexibility, or they may be made of some flexible material. *See* Pet. 61; *see also* Ex. 1005 ¶ 84 ("By using a screw that is metal with flexible or heat labile plastic threads that are large enough to be screwed into the implant, but are able to be pulled out without much force."). Thus, it is not clear on this record that such a screw, coated or not, regardless of size, could not be practically used in a dental system as taught by Bernhard and Poovey.

Finally, as to the argued impracticality of heating temporary screws in a patient's mouth for removal, this is one way Poovey teaches providing flexibility for screw threads. However, Poovey also teaches or suggests that the threads of the temporary screw are simply "flexible," which, on this record, does not appear to require heating for removal. *See, e.g.*, Ex. 1005 ¶ 84 ("[U]sing a screw that is metal with flexible or heat labile plastic threads that are large enough to be screwed into the implant, but are able to be pulled out without much force.").

3. Summary

We have considered Petitioner's assertions, Patent Owner's arguments, and the evidence of record, and find that, on the current record, Petitioner has sufficiently mapped the limitations of independent claim 1 to the combination of Bernhard, Poovey, and Gracco, and has set forth a reason with rational underpinning why the ordinarily skilled artisan would have combined these references, with a reasonable expectation of success. Based on the evidence presented at this stage of the proceeding, Petitioner has shown under Ground 4 that there is reasonable likelihood in showing that at least one of the '992 patent's claims would have been obvious. At this point in the proceeding, we focus on independent claim 1, but we institute trial on all challenged claims and all grounds.

G. GROUNDS 2, 3, 5, AND 6

Similar to limiting our analysis at this stage of the proceeding to independent claim 1, we also limit our analysis to Grounds 1 and 4. Because we find that Petitioner has shown a reasonable likelihood of success in showing at least one claim is unpatentable under Grounds 1 and 4, we do not address Grounds 2, 3, 5, or 6 herein, but we institute on all grounds as to all challenged claims.

III. CONCLUSION

On the record before us at this stage in the proceeding, Petitioner has demonstrated a reasonable likelihood of showing at trial that at least one challenged claim of the '992 patent is unpatentable under at least one ground. Accordingly, we institute an *inter partes* review of the challenged claims of the '992 patent on all grounds alleged by Petitioner. Our findings

at this stage of the proceeding are preliminary. This decision does not reflect a final determination of any fact or on the patentability of the claims.

ORDER

Accordingly, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314, an *inter partes* review of claims 1–12 of the '992 patent, in accordance with each ground of challenge in the Petition, is hereby *instituted*; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4(b), *inter partes* review of the '992 patent will commence on the entry date of this Decision, and notice is hereby given of the institution of a trial.

IPR2025-00956
Patent 11,937,992 B1

For PETITIONER:

Sheila Mortazavi
HAUG PARTNERS LLP
smortavazi@haugpartners.com

For PATENT OWNER:

Kelsey Nix
SMITH, ANDERSON, BLOUNT, DORSETT,
MITCHELL & JERNIGAN, LLP
knix@jonesday.com

Andrew Kasnevich
KDW Firm PLLC
akasnevich@kdwfirm.com

Daniel Whittle
dan.whittle@patentleverage.com