

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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ORTHOCISION, INC.,  
Petitioner,

v.

PAIN TEQ, LLC,  
Patent Owner.

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IPR2023-00625  
Patent 11,020,129 B2

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Before MICHAEL L. WOODS, RYAN H. FLAX, and  
MICHAEL A. VALEK, *Administrative Patent Judges*.

FLAX, *Administrative Patent Judge*.

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

## I. INTRODUCTION

Pain TEQ, LLC (“Patent Owner”) is the owner of U.S. Patent 11,020,129 B2 (“the ’129 patent”). Paper 7, 1. On February 22, 2023, Orthocision, Inc. (“Petitioner”) filed a Petition for *inter partes* review challenging the patentability of claims 1, 2, 9, and 10 of the ’129 patent (claims 3–8 and 11–16 are not challenged). Paper 3, 1, 3, 51–85 (“Pet.”). On June 29, 2023, Patent Owner filed a Preliminary Response to the Petition. Paper 7 (“Prelim. Resp.”). No further briefing was requested or authorized.

Under 37 C.F.R. § 42.4(a), we have authority to determine whether to institute trial in an *inter partes* review. We may institute an *inter partes* review 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, we conclude Petitioner demonstrates a reasonable likelihood it will prevail in showing that at least one challenged claim of the ’129 patent is unpatentable under the presented grounds. Therefore, we grant institution of *inter partes* review. Our reasoning is discussed below.

### A. REAL PARTIES-IN-INTEREST

Petitioner identifies “Orthocision, Inc., the patent owner, PainTEQ, LLC, and Omnia Medical, LLC,” as real parties-in-interest. Pet. 1. Patent Owner similarly identifies “PainTEQ, LLC, Orthocision, Inc., and Omnia

Medical, LLC” as real parties-in-interest. Paper 5, 1. Patent Owner updated its identification of the real parties-in-interest, as follows:

Pain TEQ, LLC, a Florida limited liability company, which is currently listed as the real party-in-interest, assigned its rights in the U.S. Patent No. 11,020,129 (“‘129 Patent”) to PTL Holdco LLC, a Delaware limited liability company, which then assigned its rights in the ‘129 Patent to PTL Opco LLC, a Delaware limited liability company. Thus, PTL Opco LLC is the current owner of the ‘129 Patent and should be added as a real party-in-interest in this *inter partes* review. Pain TEQ, LLC licensed the ‘129 Patent from the PTL Opco LLC and therefore continues to be a real party-in-interest.

Paper 9, 1.

B. RELATED MATTERS

Each party indicates there are no other matters related to this proceeding. Pet. 1; Paper 5, 1.

C. THE ‘129 PATENT

The ‘129 patent issued on June 1, 2021, from U.S. Application 17,063,613, which was filed on October 5, 2020. Ex. 1001, codes (45), (21), (22). The ‘129 patent indicates priority as a continuation-in-part to U.S. Application 16/851,840, filed on April 17, 2020, and to U.S. Provisional Application 62/910,913, filed on October 4, 2019. *Id.* at codes (60), (63), 1:7–15. Petitioner notes the ‘129 patent’s indications as to priority and does not dispute that the ‘129 patent should be accorded priority to the above-identified provisional application. Pet. 14–15, 25, 28, 33, 39, 42–43, 46, 48.

The ‘129 patent’s abstract states:

An [*sic*] method for installing a fusion implant into a sacroiliac joint (“SI Joint”) without the use of a rotary cutting instrument. The method incorporates a multimodal abrading device having abrading surfaces on opposing sides and an open tip comprising a cutting edge. The method includes the step of using the

abrading head to cut bone tissue from the SI Joint at an insertion point while simultaneously using the abrading surfaces to decorticate the cortical bone at the insertion point.

Ex. 1001, Abstr.

As Background, the '129 patent provides some explanation of the relevant anatomy, as follows:

The sacroiliac joint (“SI Joint”) is located at the interface between the sacrum and ilium bones in a human’s pelvic area. The SI Joint includes strong ligaments that permit only slight movement between the sacrum and the ilium. The sacrum is connected to the base of the spine, and each ilium is connected to the top of the leg and hip area. Thus, the SI Joint is the interface between a human’s upper body and lower body.

*Id.* at 1:28–35. Figure 1, reproduced below, illustrates a human pelvis:

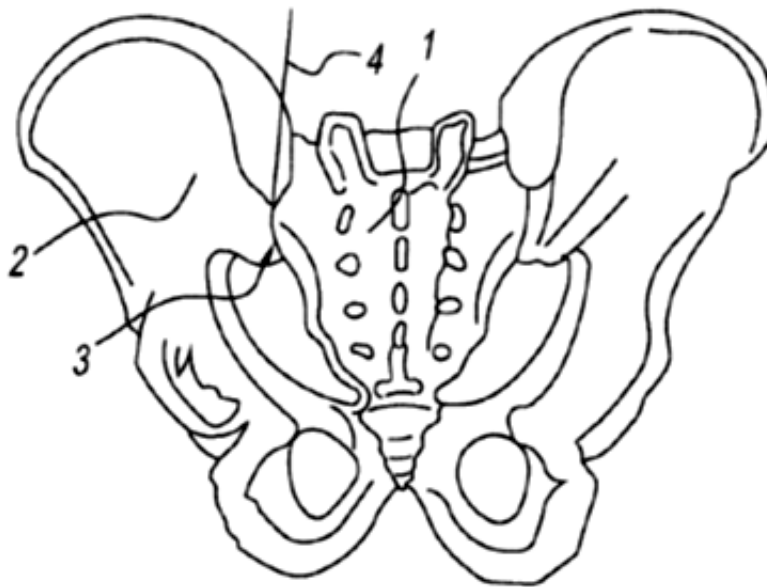


**FIG. 1**

*Id.* at Fig. 1. The '129 patent explains that Figure 1 shows a “posterior view of a typical human pelvis,” and, more specifically, the pelvis’s sacrum 1,

ilium 2, and SI joint 3 where the sacrum and ilium abut at a joint plane. *Id.* at 3:13, 4:37–42. Figure 1 also shows a “K-wire” as element 4, which is not a natural part of the anatomy, but is described in the ’129 patent as a medical device that may be used in the methods of the invention for locating and accessing the SI joint. *See id. passim.*

The ’129 patent focuses on a system and a tool for preparing an SI joint for an allograft implant (implant shown as element 5 in Figure 2) that are intended to overcome problems in the field such as procedural complexity, time consuming nature of procedure, the need for a drill or other rotary cutting instrument, and the need for additional tools like a slap/slide hammer. *Id.* at 1:36–2:6. The ’129 patent states, “[t]he present set of instruments seeks to overcome these problems by providing a slide hammer integrated into the abrading device in a single tool, which eliminates the need for using a rotary cutting instrument in the bone of the SI Joint to form a pilot hole for the implant.” *Id.* at 2:7–11.

The ’129 patent describes several embodiments of such a tool; an illustrative example is shown in Figure 21, reproduced below:

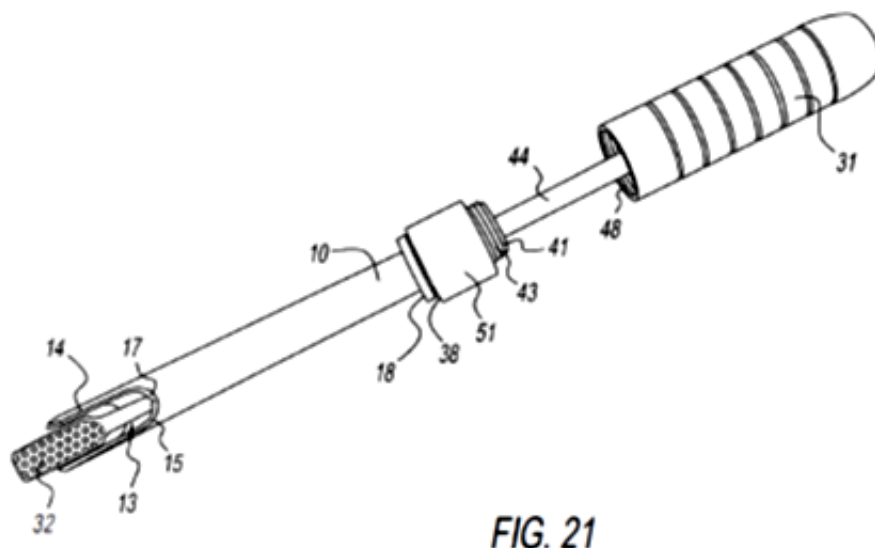


Figure 21 (which combines elements also illustrated in Figures 4 and 13) shows a system having an abrading device fully inserted into a working channel, and a slide hammer in an extended position. *Id.* at 3:55–56. As shown above, the system includes working channel 10 having arms 13 and 14 and iliac contour 15 on the plane facing out of the page (on the other side is sacral contour 16, not shown). *Id.* at 4:49–5:21. In use, working channel 10 is inserted into and seats in and against the SI joint, with iliac contour 15 against the ilium and sacral contour 16 against the sacrum, and provides access for instruments to the SI joint. *Id.* Working channel 10 is shown having channel collar 18 for receiving mating components. *Id.* at 5:27–29. Further shown above, inside working channel 10 is abrading device 30 (not numbered in this figure), which has abrading head 32 at its distal end.

Also shown above is slap hammer assembly 40 (number not shown in figure), which has base 51, hammer sleeve 31, and shaft 44. *Id.* at 6:66–7:5. The '129 patent describes that slap hammer assembly 40 has “a releasing means that releasably connects a hammer sleeve 31 to the base 51” and that “[t]he released hammer sleeve 31 is configured for sliding engagement along the shaft 44.” *Id.* at 7:1–5. The '129 patent further describes that

The releasing means is any means for releasably connecting the hammer sleeve 31 to the base 51, thereby transitioning the slide hammer assembly between its released position and its locked position. The releasing means could be a mating threaded connection, a quick disconnect attachment, a depressible tab, a latch, a clasp, a clip, a clamp, or other equivalent connection structure.

*Id.* at 7:5–12. Regarding the embodiment of Figure 21, above, the releasing means is described and illustrated as external threads 43 and threaded

connector 48, respectively on collar 41 and hammer sleeve 31. *Id.* at 7:13–48.

Abrading device 30 is described as having abrading head 32, which “is a rasp, broach, or other abrading tool that is used to grate, abrade, or otherwise decorticate the cortical bone inside the SI Joint 3.” *Id.* at 6:14–18. An embodiment of an abrading head 32 is illustrated in Figure 14, reproduced below:

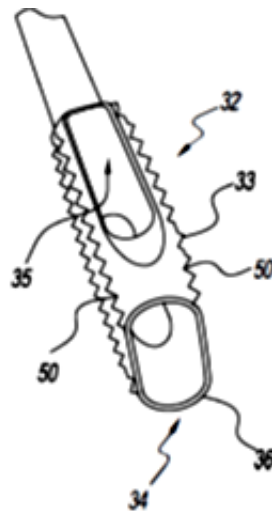


**FIG. 14**

The abrading head 32 embodiment shown in Figure 14 is shown as a “generally rectangular” end/distal portion of abrading device 30 (reference number not shown) having abrading surfaces 33 and lateral sides 35, and being an open tip 34. *Id.* at 6:19–25. More specifically, in this embodiment,

The open tip 34 comprises a cutting edge 36 around all or part of the leading edge of the open tip 34, the cutting edge 36 configured for cutting bone tissue inside the SI Joint 3, such as the sacrum 1 or ilium 2. The abrading surfaces 33 and lateral sides 35 form a box-like abrading head 32 having a void therein. The openings in the lateral sides 35 enable lateral

ingress into and egress from the void. For example, as the cutting edge 36 cuts bone tissue inside the SI Joint 3, the dislodged bone tissue falls into the void and may exit the abrading head 32 via the openings in the lateral sides 35.

*Id.* at 6:28–38.

To summarize, the '129 patent describes a system used in the following general steps: working channel 10 (combined with joint locator 20 in its channel 13—*see id.* at Figs. 5, 11) is physically advanced into the SI joint (at insertion end 11) until its iliac contour 15 abuts the ilium and sacral contour 16 abuts the sacrum, where arms 14 of working channel 10 maintain alignment (joint locator 20 is removed); abrading device 30 is inserted through working channel 10 at working end 12 to make contact with the SI joint, forced thereinto with a mallet if necessary, so cutting edge 36 cuts the relevant bone of the sacrum and ilium and abrading surfaces 33 decorticate the cortical bone in the SI joint to form a decorticated implant void (no drill or pilot hole is needed); abrading device 30 is then worked in and out of working channel 30 to abrade/decorticate the sacrum and ilium in the SI joint; if abrading head 32 becomes lodged in the SI joint, slide hammer assembly 40 is enabled to remove it (without the need to apply any counter pressure to the patient); finally, after removing abrading device 30, an implant can be advanced through working channel 10 for installation into the SI joint. *Id.* at 9:28–10:56.

The '129 patent concludes with 16 claims, of which claim 1 is the sole independent claim. Ex. 1001, 12:49–14:65. Claim 1 is illustrative and reproduced below:

1. A method of forming an implant void in a sacroiliac joint without the use of a rotary cutting instrument, the method comprising the steps of:

**[1(a)]** locating an insertion point in the sacroiliac joint, the insertion point defining an intended location for the implant void;

**[1(b)]** introducing a working channel into the insertion point, the working channel having an insertion end and a working end, the insertion end of the working channel further comprising a first iliac contour, a first sacral contour, and insertion arms;

**[1(c)]** inserting the insertion arms into the sacroiliac joint at the insertion point such that the first sacral contour is seated against a sacrum bone and the first iliac contour is seated against an ilium;

**[1(d)]** introducing an abrading device into the working channel, the abrading device comprising:

**[1(d)(i)]** an abrading head at a distal end of the abrading device, the abrading head having:

**[1(d)(i)(a)]** abrading surfaces on each of a first pair of opposing sides, the abrading surfaces comprising one or more teeth, barbs, blades, ridges, slots, broaches, or other members capable of abrading a cortical bone of the sacroiliac joint; and

**[1(d)(i)(b)]** an open tip comprising a cutting edge disposed at a leading edge of the open tip, the cutting edge configured to cut bone tissue in the sacroiliac joint; and

**[1(d)(i)(c)]** a slide hammer assembly at a proximal end of the abrading device, the slide hammer assembly having a released position that enables operation of the slide hammer assembly, a locked position that prohibits operation of the slide hammer assembly, and a releasing means for transitioning the slide hammer assembly between the locked position and the released position; and

**[1(e)]** advancing the abrading device into the sacroiliac joint such that the open tip cuts bone tissue away from the

sacrum or the ilium and the abrading surfaces decorticate the cortical bone inside the sacroiliac joint, thereby forming a decorticated implant void at the insertion point without using a rotary cutting instrument.

Ex. 1001, 12:49–13:23 (adding sub-numbering as used by Petitioner).

Dependent claim 2 (depends directly from claim 1) adds, *inter alia*, the step of unlocking the recited slide hammer and using it to dislodge the recited abrading head from the SI joint. *Id.* at 13:24–28. Dependent claim 9 (depends directly from claim 1) adds, *inter alia*, that the recited void created by the recited decorticating of claim 1 is generally rectangular (in cross section) and adapted to receive a fusion implant that is generally rectangular (in cross section). *Id.* at 14:9–14. Dependent claim 10 depends from claim 9 and is otherwise the same as claim 2. *Id.* at 14:15–19.

D. ASSERTED GROUNDS FOR UNPATENTABILITY

Petitioner asserts the following grounds for the unpatentability of claims 1, 2, 9, and 10 of the '129 patent:

| Ground | Claims Challenged | 35 U.S.C. § <sup>1</sup> | Reference(s)/Basis                                                                   |
|--------|-------------------|--------------------------|--------------------------------------------------------------------------------------|
| 1      | 1, 2, 9, 10       | 103                      | Compton, <sup>2</sup> Donner, <sup>3</sup><br>Otte, <sup>4</sup> Sharma <sup>5</sup> |
| 2      | 1, 2, 9, 10       | 103                      | Schifano, <sup>6</sup> Compton,                                                      |

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<sup>1</sup> The '129 patent has an indicated and unopposed priority date of October 4, 2019, which is after the AIA revisions to 35 U.S.C. § 103 took effect on March 16, 2013. 35 U.S.C. § 100 (note). Therefore, AIA § 103 applies. However, our decision is not impacted by which statute version applies.

<sup>2</sup> U.S. Patent 10,219,841 B1, issued Mar. 5, 2019 (Ex. 1004, “Compton”).

<sup>3</sup> US 2018/0036017 A1, published Feb. 8, 2018 (Ex. 1006, “Donner”).

<sup>4</sup> US 2005/0080422 A1, published Apr. 14, 2005 (Ex. 1007, “Otte”).

<sup>5</sup> WO 2014/091454 A1, published June 19, 2014 (Ex. 1009, “Sharma”).

<sup>6</sup> U.S. Patent 11,083,511 B2, issued Aug. 10, 2021 (Ex. 1003, “Schifano”).

| Ground | Claims Challenged | 35 U.S.C. § <sup>1</sup> | Reference(s)/Basis                |
|--------|-------------------|--------------------------|-----------------------------------|
|        |                   |                          | Martz, <sup>7</sup> Sharma        |
| 3      | 1, 2, 9, 10       | 103                      | Compton, Martz, Sharma            |
| 4      | 1, 2, 9, 10       | 103                      | Black, <sup>8</sup> Martz, Sharma |
| 5      | 1, 2, 9, 10       | 103                      | Black, Donner, Martz, Sharma      |

*See* Pet. 3.

In support of these grounds for unpatentability, Petitioner submits, *inter alia*, the Declaration of Troy D. Drewry (Ex. 1017). In response, Patent Owner submits the Declaration of Christopher J. Bovinet, MD (Ex. 2001). In the absence of evidence to the contrary, we find Mr. Drewry and Dr. Bovinet competent to testify on the subject matter of their declarations. *See infra* Section II.A; *see* Ex. 1017 ¶¶ 3–4, 6–10, 15–19, 29–36; Ex. 1018; Ex. 2001 ¶¶ 8–15, 19; Ex. 2002.

## II. DISCUSSION

### A. LEVEL OF ORDINARY SKILL IN THE ART

In determining the level of ordinary skill in the art, we consider the types of problems encountered in the art, the prior art solutions to those problems, the rapidity with which innovations are made, the sophistication of the technology, and the educational level of active workers in the field. *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986).

Petitioner asserts:

A POSITA is a person possessing at least (1) a Bachelor of Science in Mechanical, Biomechanical or Biomedical engineering, or a related field of science, as well as at least

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<sup>7</sup> US 2005/0090829 A1, published Apr. 28, 2005 (Ex. 1008, “Martz”).

<sup>8</sup> US 2016/0310197 A1, published Oct. 27, 2016 (Ex. 1005, “Black”).

three years of experience in the field of orthopedic implants or would be a practicing spinal orthopedic surgeon with at least 3 years of experience and at least some experience in the design and/or use of spinal orthopedic implants. (Ex.1017, ¶19.)

Pet. 16 (Petitioner uses the acronym POSITA to refer to the person of ordinary skill in the art).

Patent Owner argues that Petitioner’s proposed definition “fails to require any experience with the sacroiliac joint fusion procedures or the surgical tools required to perform them,” and proposes the following definition of the ordinarily skilled artisan: “a POSA would have had an engineering or a medical degree and would have had at least three years of experience with sacroiliac joint fusion procedures and the surgical tools required to perform them.” Prelim. Resp. 5–6 (citing Ex. 2001 ¶ 13) (Patent Owner uses the acronym POSA to refer to the person of ordinary skill in the art).

The parties appear to largely agree on who the person of ordinary skill in the art would have been in terms of education and field of work experience; the disagreement being on the precise type and focus of that experience. Each party cites only its witness’s definition of the ordinarily skilled artisan as support for its proposed definition. Neither party nor their witnesses cite any further supporting evidence for their proposed definitions.

We look to the ’129 patent’s Specification for guidance and find that, regarding the invention’s Field of Endeavor, and then as an introduction to the Background of the invention, it states that:

The present invention relates generally to the field of sacroiliac joint fusion procedures, and more particularly, to a unique method for fusing a sacroiliac joint without the use of a rotary cutting instrument.

...

The sacroiliac joint (“SI Joint”) is located at the interface between the sacrum and ilium bones in a human’s pelvic area. The SI Joint includes strong ligaments that permit only slight movement between the sacrum and the ilium. The sacrum is connected to the base of the spine, and each ilium is connected to the top of the leg and hip area. Thus, the SI Joint is the interface between a human’s upper body and lower body.

Ex. 1001, 1:21–35. Moreover, every claim of the ’129 patent is directed to “[a] method of forming an implant void in a sacroiliac joint.” *Id.* at 12:49–14:65.

Thus, the ’129 patent’s written description and claims support that a person of ordinary skill in the art would have been familiar with and understood the general anatomy of the SI joint, i.e., it is a part of the human body’s pelvis and spine, in fact, it is where the two are joined. Mr. Drewry testifies, for example, that:

Clinical literature, along with the inventors of the ’129 patent, that significant proportion of chronic lower back pain is attributed to SI Joints (about 15% or more). (Ex. 1001, 1:36–50; Ex. 1010, Abstract; Ex. 1011, Abstract; Ex. 1012, Abstract; Ex. 1013, p. 48; Ex. 1014, p. 2709). Given the SI Joint proximity to the spine and similarities in surgical approach and fusion techniques, orthopedic and neurological spine surgeons have recognized these joints as pain generators for decades and have adapted traditional spinal and intervertebral disc preparation instruments as their obvious choices for SI Joint fusion surgery. (*Ibid.*).

Ex. 1017 ¶ 30 (this was not specifically cited in the petition as support for the level of ordinary skill in the art). We do not discern that Dr. Bovinet similarly explains the relevant anatomy or background relating to the technology, or offers an opposing view to that of Mr. Drewry on this. *See generally* Ex. 2001.

For the purposes of this Institution Decision, we accept Petitioner’s proposed (and more detailed) definition of the person of ordinary skill in the art (or ordinarily skilled artisan), which appears to be consistent with the level of skill in the art reflected in the prior art of record and the disclosure of the ’129 patent. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (“the prior art itself [may] reflect[]” evidence 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)). However, in view of the fact that Patent Owner’s proposed definition offers some additional specificity directed to the claimed subject matter, we supplement Petitioner’s definition as follows (see addition in italics):

A POSITA would have been a person possessing at least (1) a Bachelor of Science in Mechanical, Biomechanical or Biomedical engineering, or a related field of science, as well as at least three years of experience in the field of orthopedic implants or would have been a practicing spinal orthopedic surgeon with at least 3 years of experience and at least some experience in the design and/or use of spinal orthopedic implants, *such as with sacroiliac joint fusion procedures and the surgical tools required to perform such procedures.*

We find, on the present record, that this merger of the parties’ proposed definitions best indicates the background and experience that would have been expected of the person of ordinary skill in the art.

#### B. CLAIM CONSTRUCTION

The Board interprets claim terms in an *inter partes* review using the same claim construction standard that is used to construe 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).

Should claim terms require express construction, sources for claim interpretation include “the words of the claims themselves, the remainder of the specification, the prosecution history [i.e., the intrinsic evidence], and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art.” *Id.* at 1314 (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1116 (Fed. Cir. 2004)). “[T]he claims themselves [may] provide substantial guidance as to the meaning of particular claim terms.” *Id.* However, the claims “do not stand alone,” but are part of “‘a fully integrated written instrument’ . . . consisting principally of a specification that concludes with the claims,” and, therefore, the claims are “read in view of the specification.” *Id.* at 1315 (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 978–79 (Fed. Cir. 1995) (en banc)). Any special definition for a claim term must be set forth in the specification “with reasonable clarity, deliberateness, and precision.” *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). Without such a special definition, however, limitations may not be read from the specification into the claims. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).

“[W]e need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy.’” *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

Our claim construction positions herein are preliminary. Further argument by the parties is permitted.

Petitioner proposes interpretations for the claim terms: “working channel” (of claim 1), “working end” (of claim 1), “a first iliac contour” (of claim 1), “a first sacral contour” (of claim 1), “insertion arms” (of claim 1), “abrading head” (of claims 1, 2, and 10), “open tip” (of claim 1), “decorticated implant void” (of claims 1 and 9), “releasing means” (of claims 1, 2, and 10), “without using a rotary instrument” (of claim 1), and “lodged inside the sacroiliac joint” (of claims 2 and 10). Pet. 18–20.

Petitioner provides support for its proposed interpretations in the form of cited quotes from the ’129 patent’s written description, but does not provide any rationale or explanation for adopting the proposed constructions. *Id.*

Patent Owner proposes interpretations for the two claim terms “open tip” (of claim 1) and “releasing means” (of claims 1, 2, and 10). Prelim. Resp. 8–19. Patent Owner provides substantial argument addressing its rationale for each proposed claim construction, but does not dispute or offer an alternative interpretation for any other claim terms, including those listed above as interpreted by Petitioner. *Id.*

We address the terms in dispute below.

*1. “open tip”*

The term “open tip” is found in independent claim 1. Ex. 1001, 13:6–9. For context, an “open tip” is recited as being one of several component elements of the recited “abrading device” that, in the claimed method, is introduced into the working channel and advanced into the SI joint so that the open tip cuts bone tissue. *Id.* at 12:49–13:23. The full text of the pertinent limitations of claim 1 are:

introducing an abrading device into the working channel,  
the abrading device comprising:

an abrading head at a distal end of the abrading  
device, the abrading head having:

. . . an ***open tip*** comprising a cutting edge  
disposed at a leading edge of the ***open tip***, the  
cutting edge configured to cut bone tissue in the  
sacroiliac joint . . .

[and]

advancing the abrading device into the sacroiliac joint  
such that ***the open tip cuts bone tissue away from the sacrum  
or the ilium*** and the abrading surfaces decorticate the cortical  
bone inside the sacroiliac joint, thereby forming a decorticated  
implant void at the insertion point without using a rotary cutting  
instrument.

*Id.* (emphasis added to highlight claim term).

Petitioner asserts that “open tip” means *a structure on the abrading head having an exposed tapered edge*, and as support supplies the following quote from the written description of the ’129 patent: “The open tip 34 comprises a cutting edge 36 around all or part of the leading edge of the open tip 34, the cutting edge 36 configured for cutting bone tissue inside the SI Joint 3.” Pet. 19 (citing Ex 1001, 6:28–30; Fig. 14).

Patent Owner asserts that “open tip” means *a distal end of the abrading head whose leading edge encloses an opening thereinto*. Prelim. Resp. 8–10. Patent Owner argues that Petitioner’s proposed interpretation is wrong because it gives no meaning to the plain language of the term, i.e., open and tip, and because it reads out of the claim the also-recited “cutting edge,” which is another structural component of the abrading head. *Id.* at 8. As support for its own interpretation, Patent Owner points to the ’129 patent’s Figures 14 and 15, as well as to the portions of the written

description describing the abrading head as having a void therein and a box-like shape, and that, in use, the abrading head's cutting edge cuts bone in the SI joint and the dislodged bone falls into the void. *Id.* at 9–10 (citing Ex. 1001, 6:31–33, 6:35–37, 6:39–45, Figs. 14, 15; Ex. 2001 ¶¶ 29, 30).

Considering the parties' proposed interpretations, we find Petitioner's unsupported on the current record. The portion of the '129 patent's written description and Petitioner's proposed interpretation of "open tip" share little in common, for example, the Specification does not mention "an exposed tapered edge," much less, suggest that the term "open tip" requires such. *See* Pet. 19.

On the other hand, Patent Owner's proposed interpretation is more supported in view of the '129 patent's Specification and the plain language of the claim as some sort of "opening" seems necessary for an "open tip." Prelim. Resp. 10. However, Patent Owner appears to read too much structure from the written description into the claim language as a limitation because it is not apparent that an "open tip" requires all the structural features proposed by Patent Owner, i.e., the distal end of the abrading head has a leading edge that *encloses* the opening. "[W]hile it is true that claims are to be interpreted *in light of* the specification . . . , it does not follow that limitations from the specification may be read into the claims. . . . [T]he claims define the invention." *Sjolund v. Musland*, 847 F.2d 1573, 1581–82 (Fed. Cir. 1988).

The claim terms "open" and "tip" and their combination, "open tip," are common words, used in their ordinary way, and are understandable on their face. And, what the '129 patent's written description makes clear is that the abrading head of the invention has a void (some empty space) and

that the tip of the abrading head is open to that void. *See* Ex. 1001, 6:14–50. This would include, but is not limited to Patent Owner’s proposed tip where the leading edge entirely encloses the void.

Thus, we interpret the claim term “open tip,” consistently with the intrinsic record, to mean that *the tip of the abrading head is open to an interior void of the abrading head*, which we find comports with the ordinary meaning of this claim language and the above-cited description of the ’129 patent’s Specification.

2. “releasing means”

The term “releasing means” is found in independent claim 1, claim 2, and claim 10. *Id.* at 13:10–17, 13:24–28, 1:15–19. For context, the full limitation reciting “releasing means” element of claim 1 is

[A] slide hammer assembly at a proximal end of the abrading device, the slide hammer assembly having a released position that enables operation of the slide hammer assembly, a locked position that prohibits operation of the slide hammer assembly, and *a releasing means for transitioning the slide hammer assembly between the locked position and the released position.*

*Id.* (emphasis added to highlight claim term).

A claim limitation is presumed to invoke 35 U.S.C. § 112(f) (or pre-AIA § 112(6)) if, as here, it explicitly uses the term “means” and includes functional language; this presumption is overcome if the limitation further includes the structure, material, or acts necessary to perform the recited function. *See Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1348 (Fed. Cir. 2015) (en banc).

Here, the word “means” is recited, followed by functional language, and the claim recites no structure associated with the means or function. Moreover, the parties appear to agree that this is a means plus function

limitation. *See* Pet. 19–20; Prelim. Resp. 10–19. We find “releasing means” is a means plus function limitation and, based on the plain language of the claim, the recited “releasing means” is a component element of the also recited “slide hammer assembly,” as the above-quoted claim language defines. Ex. 1001, 13:10–17.

Construing a claim term under 35 U.S.C. § 112(f) involves two steps: (1) identifying the claimed function; and then (2) determining what structure, if any, disclosed in the Specification corresponds to the claimed function. *Williamson*, 792 F.3d at 1351. In conducting this analysis, we may not incorporate structure from the written description beyond that which is necessary to perform the claimed function. *See Micro Chemical, Inc. v. Great Plains Chemical Co.*, 194 F.3d 1250, 1258 (Fed. Cir. 1999).

The function of this limitation is readily apparent in that the claim expressly recites the following: “*for transitioning the slide hammer assembly between the locked position and the released position.*” Ex. 1001, 13:15–17.

Having identified the function under § 112(f), we turn to the corresponding structure. The dispute here is whether the *releasing means* structure must connect the hammer sleeve to “the base,” that is, whether the corresponding structure must be at a specific (relative) position on the slide hammer assembly—Patent Owner argues it must (*see* Prelim. Resp. 16–17 (citing *Nomos Corp. v. Brainlab USA, Inc.*, 357 F.3d 1364, 1368 (Fed. Cir. 2004))), whereas Petitioner omits such a location or configuration feature from its proposed construction and discussion thereof (*see* Pet. 19–20).

The ’129 patent’s written description addressing the invention’s *releasing means* structure is as follows:

In one embodiment, the slide hammer assembly comprises *a base connected to a shaft*, and *a releasing means that releasably connects a hammer sleeve to the base*. The released hammer sleeve is configured for sliding engagement along the shaft. To operate the slide hammer assembly, the hammer sleeve is disengaged from the *base*, placing the slide hammer assembly in its *released position*. This *released position* enables the hammer sleeve to slide freely along the shaft. . . .

[and]

Referring to FIGS. 16, 17, and 18, the abrading device 30 further comprises a slap hammer assembly, or slide hammer assembly 40. In one embodiment, the slide hammer assembly 40 comprises *a base 51 connected to a shaft 44*, and *a releasing means that releasably connects a hammer sleeve 31 to the base 51*. The released hammer sleeve 31 is configured for sliding engagement along the shaft 44. *The releasing means is any means for releasably connecting the hammer sleeve 31 to the base 51, thereby transitioning the slide hammer assembly between its released position and its locked position. The releasing means could be a mating threaded connection, a quick disconnect attachment, a depressible tab, a latch, a clasp, a clip, a clamp, or other equivalent connection structure.*

*In one embodiment*, shown in FIGS. 16, 17, and 18, *the releasing means is a mating threaded connection*. This embodiment includes a collar 41 on the abrading device 30, a slide hammer shaft 44, and the hammer sleeve 31. The collar 41 comprises internal threads 42 and external threads 43. The shaft 44 comprises a threaded end 45 and a stop end 46. The hammer sleeve 31 has a threaded connector 48 and a hollow, cylindrical bore comprising an internal diaphragm 47 having a diaphragm opening 49 (see FIG. 18). The diaphragm opening 49 is sized to permit sliding passage of all parts of the shaft 44 except the stop end 46. The stop end 46 is sized too large to fit through the diaphragm opening 49.

To assemble the slide hammer assembly 40 of this embodiment, the threaded end 45 of the shaft 44 is inserted into

the bore of the hammer sleeve 31, through the diaphragm 47 inside the hammer sleeve 31, and the threaded end 45 is threaded into, and mated with, the internal threads 42 of the collar 41. The threaded connector 48 in the hammer sleeve 31 is then mated to the external threads 43 on the collar 41 to promote a secure connection. The stop end 46 is disposed inside the bore of the hammer sleeve 31 on a side of the diaphragm 47 opposite that of the location of the threaded connector 48. ***In this configuration, shown in FIG. 20, the slide hammer assembly 40 is in its locked position.***

To operate the slide hammer assembly 40, the threaded connector 48 is disengaged from the external threads 43 of the collar 41, ***placing the slide hammer assembly 40 in its released position***, which is shown in FIG. 21. This released position enables the hammer sleeve 31 to slide freely along the shaft 44. The hammer sleeve 31 is pulled until the diaphragm 47 inside the hammer sleeve 31 engages the stop end 46 of the shaft 44, thereby causing an impact that delivers the slide hammer force. ***Thus, the slide hammer assembly has a released position that enables operation of the slide hammer assembly, and a locked position that prohibits operation of the slide hammer assembly.***

Ex. 1001, 6:66–7:48 (emphasis added).

As can be seen from the above-quoted portion of the Specification, the structure for the “releasing means” includes a variety of mechanisms that can lock and unlock the slide hammer for operation, including, “a mating threaded connection, a quick disconnect attachment, a depressible tab, a latch, a clasp, a clip, [or] a clamp.” *Id.* But, as argued by Patent Owner, the Specification describes that for any such mechanism, it “releasably connects a hammer sleeve 31 to the base 51,” and that “[t]he releasing means is any means for releasably connecting the hammer sleeve 31 to the base 51.” *Id.*; *see also* Prelim. Resp. 12–16 (“the interface between the base and the distal end of the hammer sleeve is the only location specified in the ‘129 Patent for

disposing the ‘releasing means.’”) (citing Ex. 2001 ¶ 36). Understanding that the identified corresponding structure must be limited to only that which is necessary to perform the recited function, we also recognize that every embodiment described in the ’129 patent describes that the “releasing means” connects a hammer sleeve to a base. Thus, as in the *Nomos* case cited by Patent Owner, we determine that such a structural configuration must be part of the corresponding structure in interpreting this means-plus-function claim element: there is a sliding hammer sleeve and a base to which it may be locked and unlocked. *See Nomos Corp.*, 357 F.3d at 1368–69.

The question presents itself: what is the “base” that is associated with the “releasing means” and hammer sleeve? The ’129 patent describes that

In one embodiment, the slide hammer 60 assembly comprises *a base* connected to a shaft, and *a releasing means* that releasably connects a hammer *sleeve* to *the base*. The released hammer *sleeve* is configured for sliding engagement along the shaft. To operate the slide hammer assembly, the hammer *sleeve* is disengaged from *the base*, placing the slide hammer assembly in its *released position*.

Ex. 1001, 2:59–66 (emphasis added). This is the broadest description of the “base” associated with the hammer sleeve and “releasing means.” No “base” is expressly recited by the claims.

Thus, per the Specification, the base of the slide hammer assembly is a structure connected to the slide hammer assembly’s shaft structure, and the hammer sleeve of the slide hammer assembly (which can slide along the shaft) is releasably connected (connectable) to that base. It is our understanding, on the preliminary record, that the base is a structure to which the sliding hammer sleeve is engaged when locked to prevent its movement.

The '129 patent does illustrate an embodiment (at Figures 16, 17, and 21) where the base (reference 51) is part of or directly connected to the proximal end of the abrading device (reference 30), but this specific structural relationship is not described in the written description (nor is it expressly claimed), and the written description does not express that this is a required structural configuration, but rather calls it “one embodiment.” *Id.* at 6:66–7:47. Thus, although at this point we agree with Patent Owner that the corresponding structure includes that the releasable connection be between a hammer sleeve and a base of the slide hammer assembly, we discern no reason to limit the structure to one preferred embodiment, such as this embodiment.

To summarize, we note the recited function of this limitation is “*for transitioning the slide hammer assembly between the locked position and the released position.*” Further, in view of the above, we interpret the corresponding structure of the “releasing means” to be: *a mating threaded connection, a quick disconnect attachment, a depressible tab, a latch, a clasp, a clip, or a clamp, releasably connecting a hammer sleeve to a base,* and equivalent structures. This interpretation differs little from the language argued by Patent Owner other than our substitution of “a” for “the” when introducing the hammer sleeve and base elements, and our reordering of the language to place the “equivalents” phrase at the end of the sentence to better comport with the statute’s requirement that equivalents apply to the entire corresponding structure. *Williamson*, 792 F.3d at 1348 (identifying that the statute states, the limitation shall be interpreted to “cover the corresponding structure, material, or acts described in the specification and equivalents thereof.” (quoting pre-AIA § 112(6))).

3. *Summary on Claim Construction*

At this stage of the proceeding, we expressly construe only the two claim terms noted above. We determine that no other express construction of any claim term is necessary for purposes of rendering this Institution Decision. *See Nidec Motor Corp.*, 868 F.3d at 1017.

If either party intends to further argue claim construction at trial, they should do so in a clearly designated section of their briefing so as to expressly identify such arguments. *See, e.g.*, 37 C.F.R. § 42.104(b)(3) (content of petition); *see also* Board’s Consolidated Trial Practice Guide (CTPG), 84 FR 64280, 46, 48–45 (Nov. 2019) (available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>). Critical claim construction arguments should not be relegated to or hidden within patentability arguments on the facts.

C. LEGAL STANDARDS FOR ANALYZING PATENTABILITY

“In an IPR, 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 ultimate burden never shifts to Patent Owner.<sup>9</sup> *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).

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<sup>9</sup> Although we refer herein to certain of Patent Owner’s arguments as being not persuasive, we do not shift the ultimate burden of proof from Petitioner. Such non-persuasiveness is in the context of the parties’ arguments and the record as a whole.

An *inter partes* review may be instituted if the information presented by a petitioner in their petition, in view of a 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 their petition. 35 U.S.C. § 314.

Regarding obviousness, the Supreme Court in *KSR Int'l 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 as follows: (1) determining the scope and content of the prior art; (2) ascertaining the differences between the prior art and the claims at issue; (3) resolving the level of ordinary skill in the art;<sup>10</sup> and (4) considering objective evidence indicating obviousness or non-obviousness.<sup>11</sup> *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.” *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.

The motivation-to-combine analysis is a flexible one. “[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

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<sup>10</sup> See *supra* Section II.A.

<sup>11</sup> At this point, there is no asserted evidence pertaining to objective indicia of non-obviousness. See Prelim. Resp.

combining the elements in the manner claimed,” but the “analysis ‘need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.’”

*Intel Corp. v. PACTXXP Schweiz AG*, 61 F.4th 1373, 1379–80 (Fed. Cir. 2023) (quoting *KSR*, 550 U.S. at 418, 420 (emphasis added)). “[I]f there’s a known technique to address a known problem using ‘prior art elements according to their established functions,’ then there is a motivation to combine,” because *KSR* explains that “‘if a technique has been used to improve one device [or method], and a person of ordinary skill in the art would recognize that it would improve similar devices [or methods] in the same way, using the technique is obvious unless its actual application is beyond his or her skill.’” *Id.* at 1380 (quoting *KSR*, 550 U.S. at 417; and *Intel Corp. v. Qualcomm Inc.*, 21 F.4th 784, 797 (Fed. Cir. 2021)). If addressing a known problem, the prior art combination need not be “the *best* option, only . . . a *suitable* option.” *Id.* (quoting *Intel*, 21 F.4th at 800 (emphasis original)).

With these standards in mind, and in view of the definition of the ordinarily skilled artisan and claim interpretation above, we address Petitioner’s challenges below.

D. PETITIONER’S ASSERTED PRIOR ART

1. *Schifano (Ex. 1003)*

*Schifano* issued as U.S. Patent 11,083,511 B2 on August 10, 2021, from U.S. Application 16/718,189, which was filed on December 18, 2019, and it indicates priority to March 25, 2015, via a continuation application, and to March 15, 2013, via a continuation-in-part application. *Ex. 1003*,

codes (10), (45), (21), (22), (63). There is currently no dispute that Schifano is prior art. *See generally* Prelim. Resp.

Schifano's Abstract states:

An improved method of fusing the sacroiliac joint and tools for accomplishing the same is disclosed. In one embodiment, the present invention is a method that uses an intra articular joint fusion device for connecting the sacrum and ilium that includes creating a first incision in the patient's skin proximal to the patient's sacroiliac joint, inserting a surgical channel tool into the incision from the patient's posterior, creating a void in the sacroiliac joint, inserting a fusion implant into the void, the fusion implant having at least one fixation element for engagement with bone tissue in the articular surfaces of the sacrum and the ilium, and driving the fusion implant into the void such that the at least one fixation element engages with bone tissue in an articular surface of at least one of the sacrum and ilium, and the fusion implant fixes relative positions of the sacrum and ilium.

Ex. 1003, Abstr. A channel tool, as mentioned in Schifano's Abstract, is illustrated at its Figure 30, reproduced below:

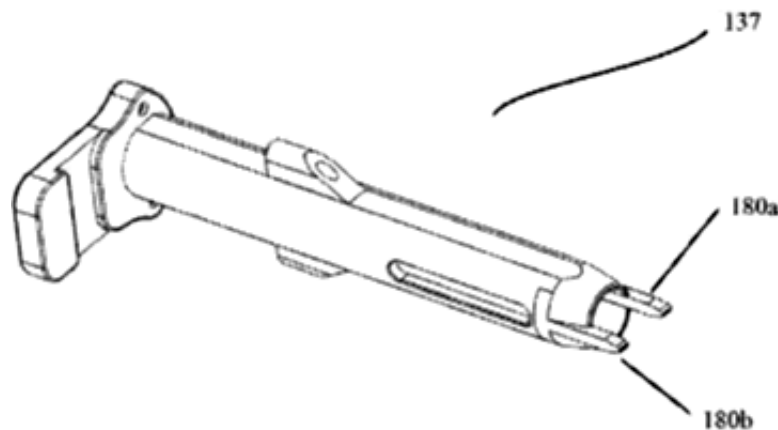


Figure 30 “is a perspective view of a surgical tool according to an embodiment of the [Schifano] invention” and it shows exposure device 137, which Schifano discloses has a hollow barrel working channel 239 (not

numbered in figure) for passing various surgical tools into the SI joint, and that exposure device 137 “may be engaged with a posterior side of the sacroiliac joint.” *Id.* at 6:43–44, 13:51–60. Schifano discloses that an insertable end 142 (not numbered in figure) of working channel 239 may have a rounded circular or oblong geometry and a tapered or rounded profile, and further that “one or more prongs or tangs [180a and 180b] . . . extend beyond the end of the hollow barrel” “to help stabilize the position of the working channel in the SI joint.” *Id.* at 15:8–35.

One tool disclosed by Schifano to be used within working channel 239 is chisel 131, which is illustrated at Figure 24, reproduced below:

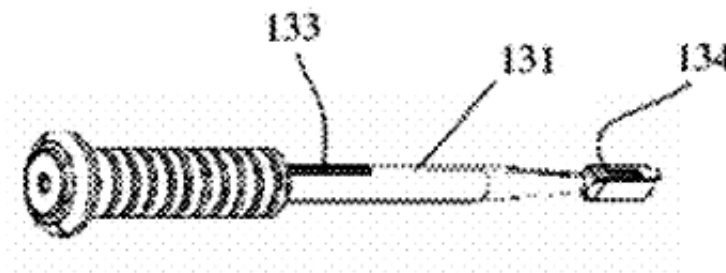


FIG. 24

Figure 24 is a perspective, side view of a box chisel from its proximal end and it shows chisel 131, which has distal tip 134 with cutting edges, and timing feature 133 that mates with the inside of working channel 239, and Schifano discloses that the chisel is used “to provide an opening in the bone [at the SI joint] with desired dimensions.” *Id.* at 6:34, 19:44–67. Schifano discloses that “distal tip 134 may also have a containment device for removal of surgical site bone and windows may exist in the containment device to collect bone debris and remove bone debris.” *Id.* 19:54–58.

We note Schifano also discloses using a drill bit apparatus to displace bone in the SI joint. *Id.* at 5:1–28, 19:31–43. However, we also note Schifano discloses that the use of a drill is optional, as it “may be included in the set” of tools. *Id.* at 19:31–43.

2. *Compton (Ex. 1004)*

Compton issued as U.S. Patent 10,219,841 B1 on March 5, 2019, from U.S. Application 15/793,105, which was filed on October 25, 2017. Ex. 1004, codes (10), (45), (21), (22). There is currently no dispute that Compton is prior art. *See generally* Prelim. Resp.

In its Abstract, Compton states:

Bone structure coupling devices and methods are provided herein. An example method includes positioning a tubular retraction guide body into a patient, the tubular retraction guide body having two prongs that are positioned in a joint between two adjacent bone structures, creating a hemispherical groove on each of the two adjacent bone structures using a drill bit passed through the tubular retraction guide body, incising out the hemispherical grooves with a broach passed through the tubular retraction guide body, and inserting a graft body having a generally rectangular cross sectional area into the angular grooves to couple the two adjacent bone structures together.

Ex. 1004, Abstr. Compton illustrates the tubular retraction guide body mentioned in its Abstract, at Figure 3, reproduced below:

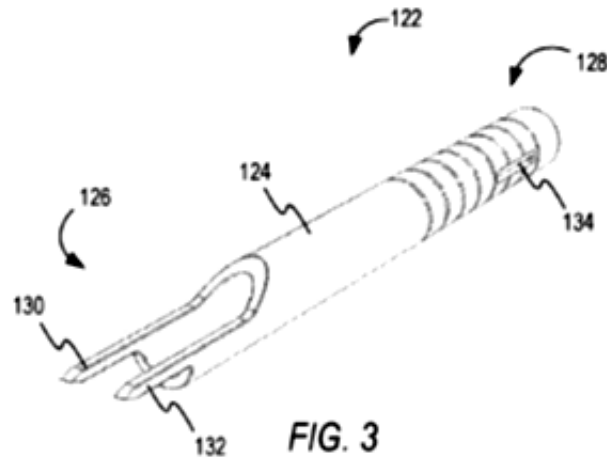


Figure 3 “is a perspective view of a retraction guide,” and Compton discloses that it shows retraction guide 122 with body 124 that is hollow to allow it to fit over a finder device, and also having first end 126 and second end 128, where first end 126 has body arms 130 and 132, which are to be “driven into the SJ.” *Id.* at 2:17–18, 3:52–65.

Compton discloses that “[t]he retraction guide 122 stays in place inside the SJ [sacroiliac joint] while subsequent devices and methods are utilized in cooperation with the retraction guide body 122.” *Id.* at 4:11–13. A method disclosed by Compton includes drilling through retraction guide 122 with drill bit 136 into the bone to create a hole. *Id.* at 4:14–34. This is followed by using broach device 148 having handle 156 and incising member 164, also within retraction guide body 122, to create angular grooves in adjacent bone structures of the SJ. *Id.* at 45–67.

Figures 6 and 7, reproduced below, illustrate such an incising member:

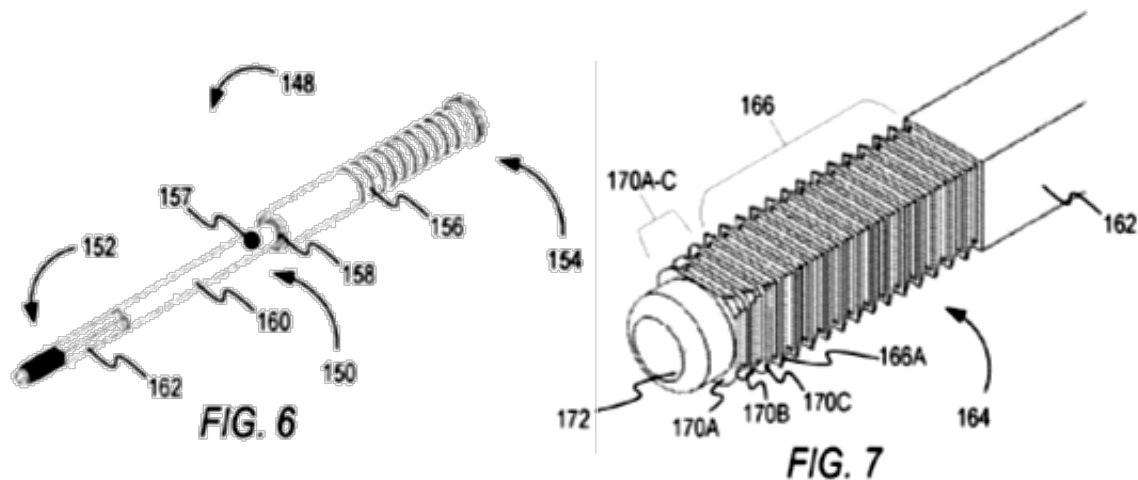


Figure 6 shows a perspective view of a broach device and Figure 7 shows a close up view of the incising member of the broach device. *Id.* at 2:23–26. These figures show broach device 148 having body 150 with first end 152 and second end 154, the latter having handle 156 with collar 158. *Id.* at 4:45–59. A cylindrical portion 160 of broach device 148 extends from handle 156 and transitions to a substantially rectangular portion 162, which terminates in (still-rectangular) incising member 164. *Id.* Incising member 164 has cutting teeth 166 and cylindrical tip 172. *Id.* at 5:1–25.

The results of using the retraction guide 122, drill bit 136, and broach device 148 can be seen at Figure 15, reproduced below:

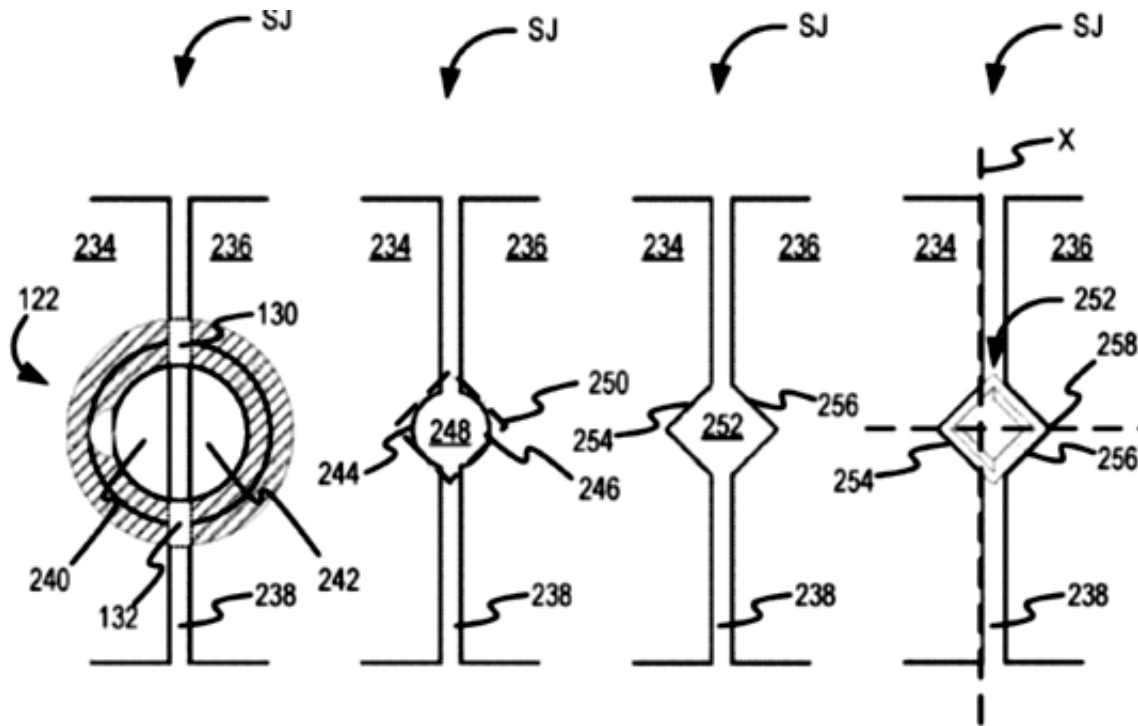


FIG. 15

Figure 15 shows the creation of a rectangle pilot hole that receives a graft at sequential stages shown in side-by-side illustrations of the localized SI joint (synonymous with “SJ” used in reference) being treated. *Id.* at 2:43–45.

Figure 15 shows SI joint having sacrum 234 and ilium 236. *Id.* at 6:60–63.

The figure further shows body arms 130 and 132 of the retraction guide 122 in the SI joint, where the retraction guide allows a pathway to be positioned over bone structures 234 and 236. *Id.* at 7:8–15. Drill bit 136 is passed through retraction guide 122 and creates aperture 248, then incising member 164 is driven into hole 248 to create rectangular pilot hole 252. *Id.* at 7:16–49.

3. *Black (Ex. 1005)*

Black published as US 2016/0310197 A1 on October 27, 2016, and was filed as U.S. Application 15/136,615 on April 22, 2016. Ex. 1005, codes (10), (43), (21), (22). There is currently no dispute that Black is prior art. *See generally* Prelim. Resp.

Black's Abstract states:

A system for preparing the sacroiliac (SI) joint for an SI joint fusion, and optionally delivering an implant to the SI joint, is described herein. The implant is inserted via an inferior inlet approach. A sliding joint finder is inserted into the joint, followed by insertion of a working cannula. The working cannula is operatively coupled to the sliding joint finder, in that it is configured to fit over the sliding joint finder, allowing subsequent removal of the sliding joint finder, and providing a hollow cavity for joint fusion preparation, decortication and insertion of an implant. This system and method provides a less invasive and safer approach for fixing an SI joint or delivering an implant to the SI joint than currently available methods.

Ex. 1005, Abstr. A working cannula, as mentioned in the Abstract, is illustrated at Figure 3A, reproduced below:

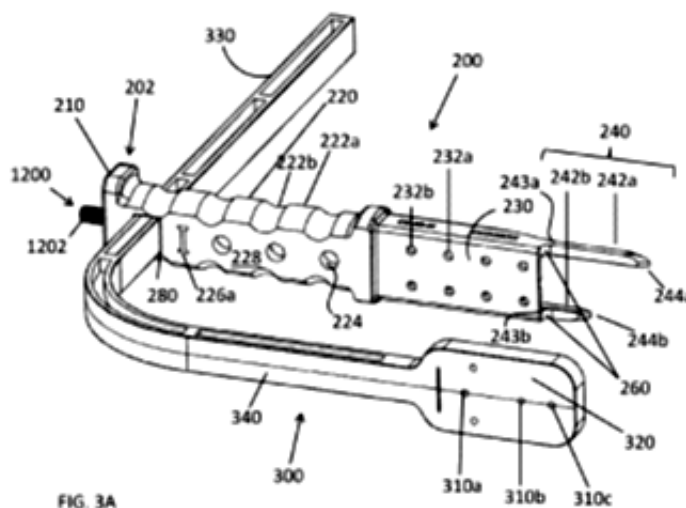


Figure 3A shows a side view of a working cannula. *Id.* ¶ 15. Black discloses that

The working cannula is an instrument that has a suitable height and width for insertion into the SI Joint and to interact with the other tools in the system. The working cannula contains a cavity, which runs down the central axis. The cavity provides a working space through which other tools in the system are inserted and within which the other tools are used to prepare the SI Joint, or insert the implant into the SI Joint.

*Id.* ¶ 45. Figure 4 shows working cannula's 200 distal end 210 and proximal end 240, and further has two protrusions 244a and 244b at proximal end 240.<sup>12</sup> *Id.* ¶ 48. "The distance between the two protrusions is selected so that the protrusions fit directly into the SI joint (FIG. 10). The distance between the protrusions is selected to allow insertion of an implant, Such as a spacer, directly between them." *Id.* Working cannula 200 also has shelf 260 that, in use, is adjacent the ilium and an opposite side that, in use, faces the sacrum (one may be marked with an "I" and the other an "S"). *Id.* ¶¶ 49–50.

Black discloses that in one embodiment a drill is used within the working cannula to prepare the implant site. *Id.* ¶¶ 67–69. Black discloses that in another embodiment a box chisel is used in the working cannula to prepare the SI joint for implant. *Id.* ¶¶ 70–73. Figure 7, reproduced below, illustrates a box chisel:

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<sup>12</sup> Black appears to use the terms "distal" and "proximal" in the opposite way as the other cited references discussed herein. It is our understanding that in the relevant field "distal" refers to things further from a user or center and "proximal" refers to things closer to a user or center, which is how we understand the other cited references to use the terms. This does not affect our understanding of Black's disclosure.

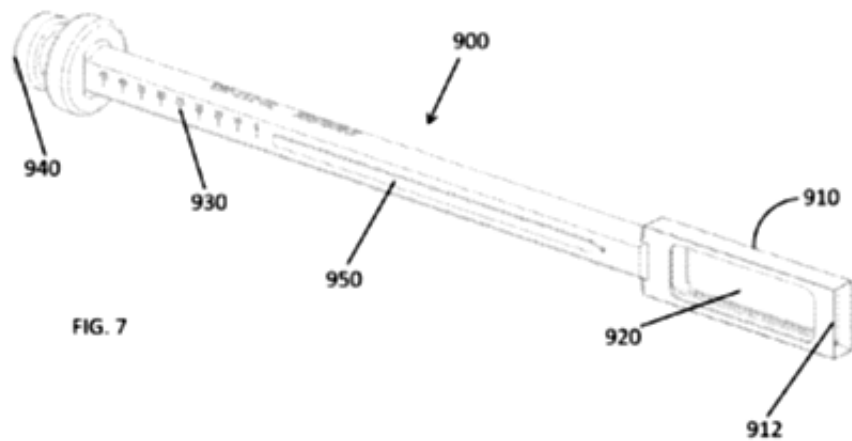


Figure 7 is a perspective view of box chisel 900 and shows it has a sharp rectangular cutting edge 912 at proximal end 910 and box-shaped cavity 920 with slots or windows to collect and remove bone fragments. *Id.* ¶ 71.

Black also discloses an embodiment where a joint rasp is used in the working cannula. *Id.* ¶¶ 74–80. Figure 8, reproduced below, illustrates a rasp:

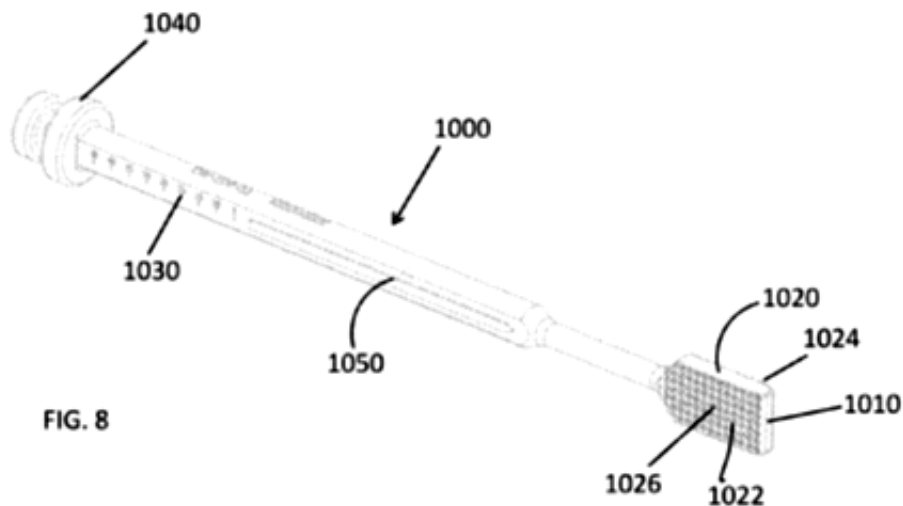


Figure 8 shows a perspective view of rasp 1000 having rounded leading edge 1010, flat sides 1024 and 1026, each having sharp structures to create

abrasive surfaces to aid in cutting away bone surfaces at the SI joint. *Id.* ¶¶ 76–77.

Each of the box chisel 900 and rasp 100 have distal ends, 940 and 1040 respectively, configured for attachment of other tools, for example “a slap handle for insertion or removal of the tool.” *Id.* ¶¶ 73, 80.

4. *Donner (Ex. 1006)*

Donner published as US 2018/0036017 A1 on February 8, 2018, from U.S. Application 15/785,997, which was filed on October 17, 2017.

Ex. 1006, codes (10), (43), (21), (22). There is currently no dispute that Donner is prior art. *See generally* Prelim. Resp.

Donner’s Abstract states:

A method of surgically preparing a sacroiliac joint comprising:  
a) approaching a sacroiliac joint space with a joint preparation tool comprising a cutting element including an exterior having an asymmetric cutting band such that the first side includes a first surface having a first texture and the second side includes a second surface having a second texture, the first and second textures being different such that the first texture is substantially smoother than the second texture; and  
b) delivering at least a portion of the cutting element non-transversely into the sacroiliac joint space for decortication, the cutting element being oriented in the sacroiliac joint space such that the first surface opposes the generally softer sacrum and the second surface opposes the generally harder ilium in order to more aggressively prepare the surface of the ilium while not

over-preparing the sacrum to provide a robust biologic environment for intra-articular fusion.

Ex. 1006, Abstr. A joint preparation tool as mentioned in the Abstract is illustrated at Figure 7, reproduced below:

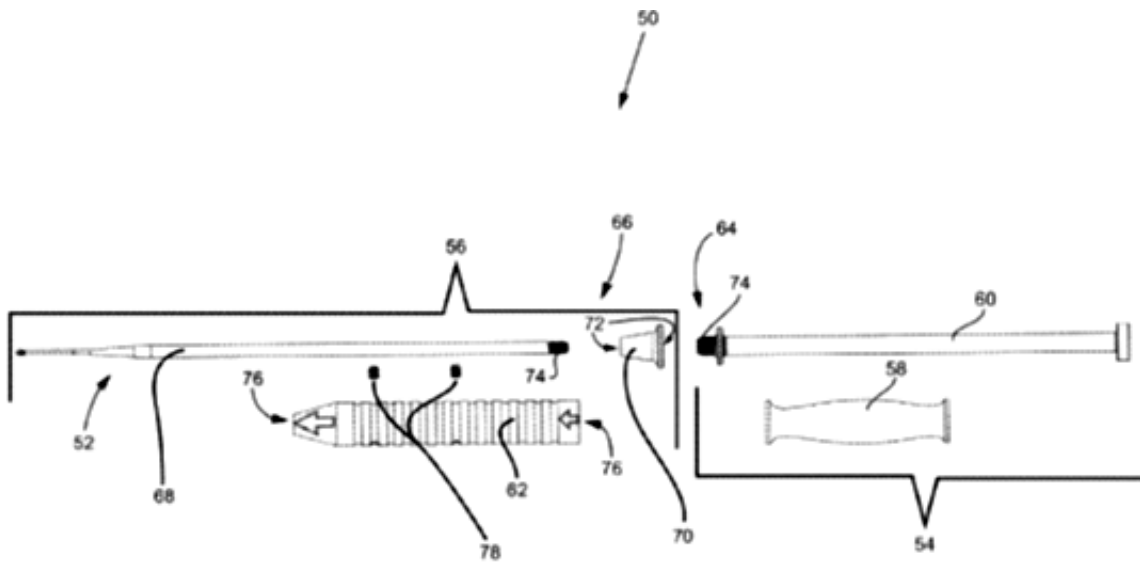
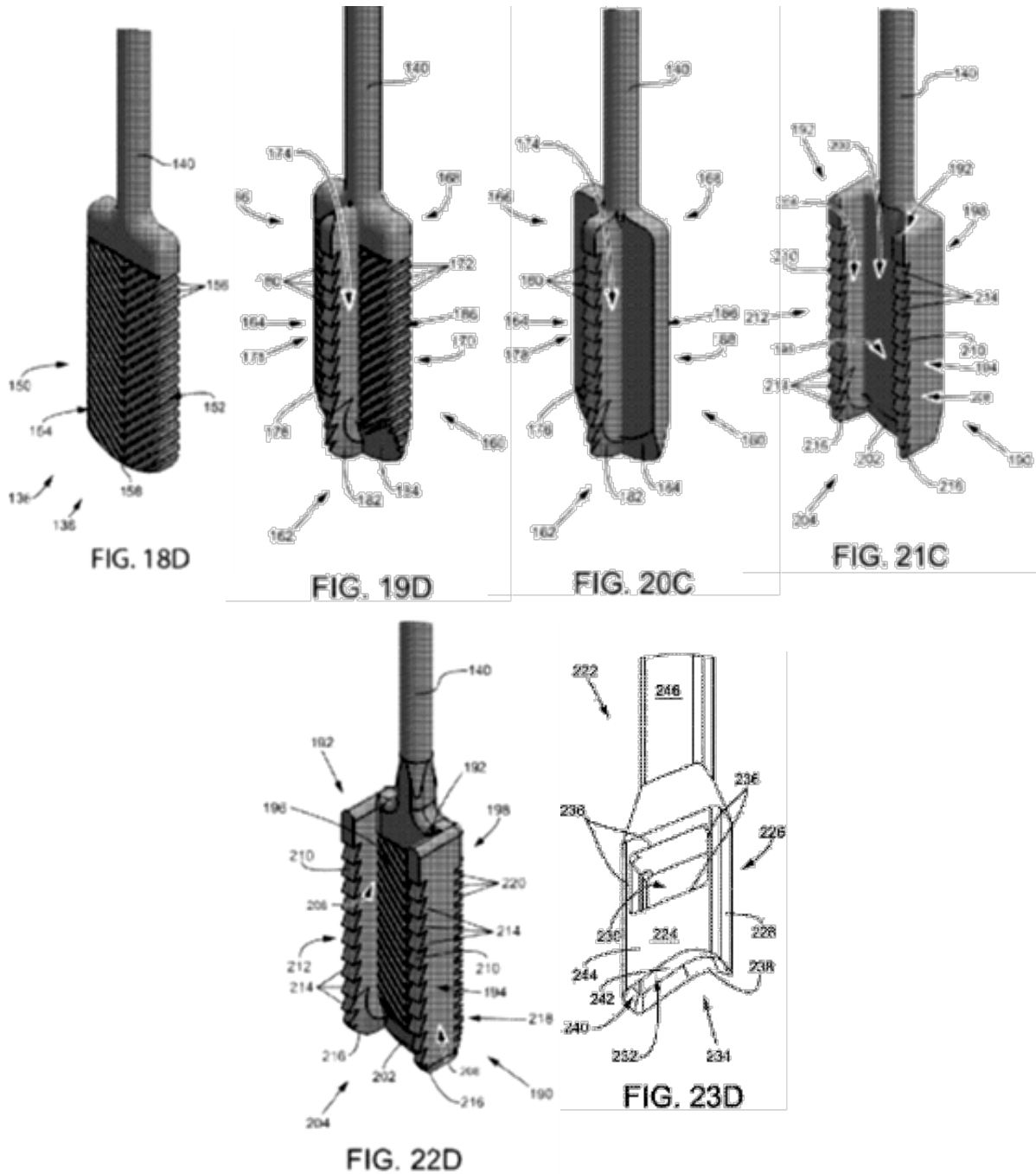


FIG. 7

Figure 7 shows an exploded side view of joint preparation tool 50, which includes cutting tool assembly 56 and slap hammer assembly 54. Ex. 1006 ¶¶ 43, 164. Cutting tool assembly 56 includes interchangeable tooling head 52, shaft 68, handle 62, and connector 70. *Id.* ¶ 164. Slap hammer assembly 54 includes handle 58, shaft 60, and threads 74 to connect it to cutting tool assembly 56. *Id.* Handle 62 may be locked in place with a pair of set screws 78 such that it abuts the connector 70. *Id.* Slap hammer assembly is used for advancing into or backing tooling head 52 out of an SI joint. *Id.* ¶¶ 165–167.

As for tooling head 52 of joint preparation tool 50, Donner discloses several embodiments at Figures 18D, 19D, 20C, 21C, 22D, and 23D (*see id.* ¶ 179), reproduced side-by-side below:



Figures 18D–23D above show close-up, isometric views of six variations of a tooling head, all but Figure 23D showing the tooling head from a top perspective, viewing the device from its more proximal end, and Figure 23D showing the tooling head from a bottom perspective, viewing the device from its more distal end. *Id.* ¶¶ 61, 65, 68, 71, 75, 79. Each tooling head is attached to a shaft, 140, 246, and each tooling head is generally rectangularly shaped.

Tooling head of Figure 18D is shown as planar rasping head 136, which has a pair of opposing planar surfaces 150 and a pair of opposing side edges 152 therebetween, all having ridges 156. *Id.* ¶¶ 181–182. Tooling head shown in Figure 19D is also planar rasping head 160 like that of Figure 18D, but adds a perpendicularly extending cutting element 164 rising from planar surface 166 and double chamfered tip 184. *Id.* ¶ 184. Tooling head shown in Figure 20C is another planar rasping head 160 and is like that shown in Figure 19D, but planar surface 188 has no ridges. *Id.* ¶ 187. Tooling head of Figure 21C is planar rasping head 190, which has a pair of perpendicularly extending cutting elements 192 with teeth 214 on each side edge 194 and double chamfered tip 202, defining an area with inner surfaces 200, 206. *Id.* ¶ 188. Donner discloses that such a device is used to cut the ilium at the SI joint, then withdrawn, rotated 180°, and reinserted to cut the sacrum at the SI joint for an implant. *Id.* ¶ 189. The tooling head of Figure 22D is shown as planar rasping head 190 having a pair of perpendicularly extending cutting elements 192 and is very similar to the device of Figure 21C, but adds rasping surface 218 with ridges 220 on inside planar surface 196 and outside planar surface 198. *Id.* ¶ 190. Finally, the tooling head of Figure 23D is box osteoma head 222, which has planar top member 224,

planar bottom member 226, side members 228, openings 230, and open distal end 234 exposing cavity 232 inside the tooling head, and cutting edge 238. *Id.* ¶ 191.

Donner also discloses that a drill may optionally be used to prepare an SI joint for implant. *See id.* ¶ 270, Fig. 44.

5. *Otte (Ex. 1007)*

Otte published as US 2005/0080422 A1 on April 14, 2005, from U.S. Application 10/685,768, which was filed on October 14, 2003. Ex. 1007, codes (10), (43), (21), (22). There is currently no dispute that Otte is prior art. *See generally* Prelim. Resp.

Otte's Abstract states:

A set of surgical instrument[s] for use with expandable spinal implants. The set of instruments includes box chisels designed to prepare a site for implant placement. The set of instruments also includes inserter/expander instruments configured to place and expand an implant at the site. The set of instrument[s] further includes assembling/collapsing instruments configured to assemble an implant, and collapse or reduce the height of an expanded implant.

Ex. 1007, Abstr. A box chisel as mentioned in the Abstract is illustrated at Figures 6 and 7, reproduced below:

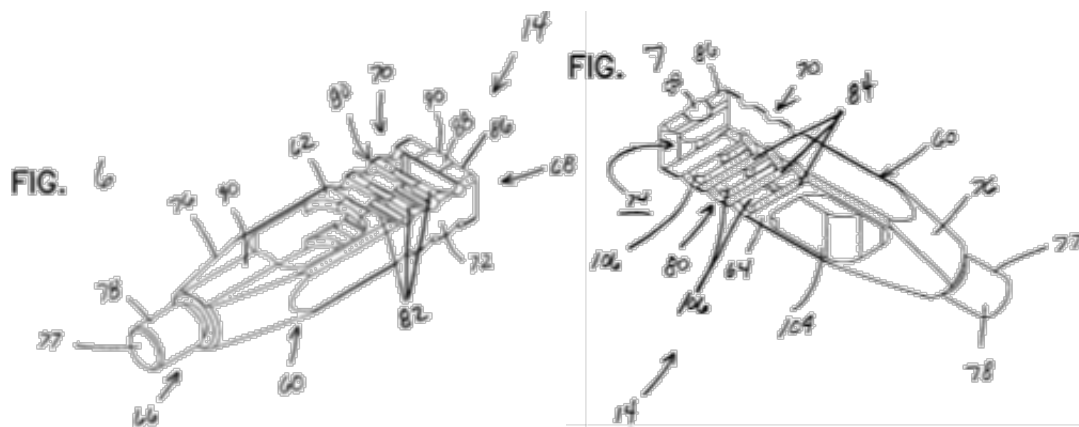


Figure 6 is a top perspective view of a box chisel and Figure 7 is a bottom perspective of the same box chisel. *Id.* ¶¶ 20–21. The figures show box chisel 14 having working portions 70 at distal end 68, hollow construction 72 and central open region/interior space 74. Box chisel 14 also has perimeter cutting edge 86, and surface texture / scraping arrangement 80 and can be forcibly inserted into or hammered between vertebral elements for site preparation to cut out a plug of material for removal. *Id.* ¶ 68. Such a box chisel can also, in other embodiments, have rasping surfaces 130, 131. *Id.* ¶¶ 78–80, Figs. 11, 12.

6. *Martz (Ex. 1008)*

Martz published as US 2005/0090829 A1 on April 28, 2005, from U.S. Application 10/808,186, which was filed on March 23, 2004. Ex. 1008, codes (10), (43), (21), (22). There is currently no dispute that Martz is prior art. *See generally* Prelim. Resp.

Martz's Abstract states:

A chisel with distal cutting edges, used to form channels in adjacent vertebrae, includes a shank having a longitudinal axis and a cutting head coupled to the distal end of the shank. The cutting head includes distal cutting edges, which may be linear, arcuate, or V-shaped, and a guide member, which may be hollow or formed as two spaced members, to guide the chisel into the disc space to uniformly chisel both adjacent vertebrae simultaneously to partially form a channel in the vertebrae. The guide member and cutting head may have openings for distributing cut debris to the top and bottom surfaces of the head. The guide member may also include distal transverse, longitudinal side and/or vertical cutting edges, some of which may be in stepped relationship, for further cutting the endplates and removing disc material from between adjacent vertebrae,

and for scraping of endplates. Other embodiments are disclosed.

Ex. 1008, Abstr. A chisel as mentioned in the Abstract is illustrated at, *inter alia*, Figures 76a and 76c, reproduced below:

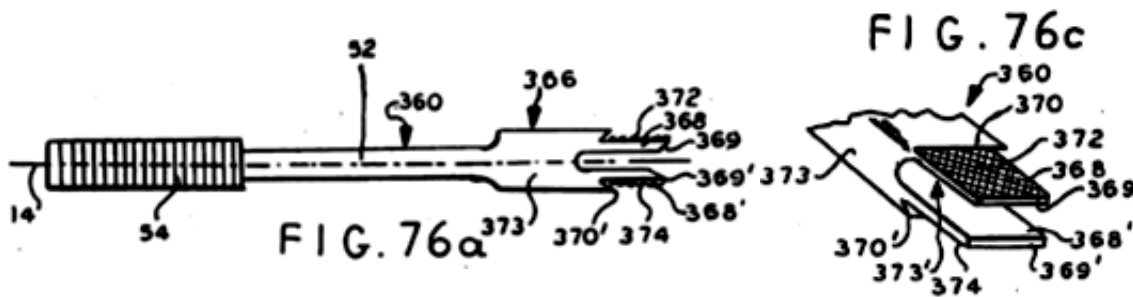


Figure 76a is a side view of a chisel instrument with a shank and a handle, terminating in a cutting head, and Figure 76c is a more detailed isometric view of the same cutting head. *Id.* ¶¶ 186, 188. These figures show cutting head 342 (not numbered in figures) having a pair of rasp surfaces 372, 374, adjacent cutting edges 370, 370' where those rasp surfaces 372, 374 meet the body of the cutting head, and a pair of cutting edges 369, 369' at the distal ends of rasp surfaces 372, 374, where an open area (not numbered) is defined inside rasp surfaces 372, 374. *Id.* ¶¶ 302–306. Martz states that “[t]he rasp surface 372 preferably thus is on the top and bottom opposite surfaces of both of the guide members 368 and 368' and may be used to scrape disc material and bone from adjacent vertebrae.” *Id.* ¶ 306.

7. *Sharma (Ex. 1009)*

Sharma published as WO 2014/091454 A1 on June 19, 2014, from international patent application PCT/IB2013/060900, which was filed on December 13, 2013. Ex. 1009, codes (10), (43), (21), (22). There is currently no dispute that Sharma is prior art. *See generally* Prelim. Resp.

Sharma's Abstract states:

The present invention relates to universal impactor with slap hammer device for applying force for use to assist in the impaction and/or extraction of surgical instrument attached thereto from an orthopedics structure. The device acts as an impacting tool that is useful for mating to a medical instrument used during surgery. It can also be converted to an extracting tool by manipulating the quick release mechanism. The impacting/extracting device is effective in applying an axial force to the medical instrument to efficiently and effectively prepare a bone structure, insert or remove implant trial, insert or remove implant, or to remove a medical instrument from the bone structure.

Ex. 1009, Abstract. Figure 4, reproduced below, illustrates a slap hammer device as mentioned in the Abstract:

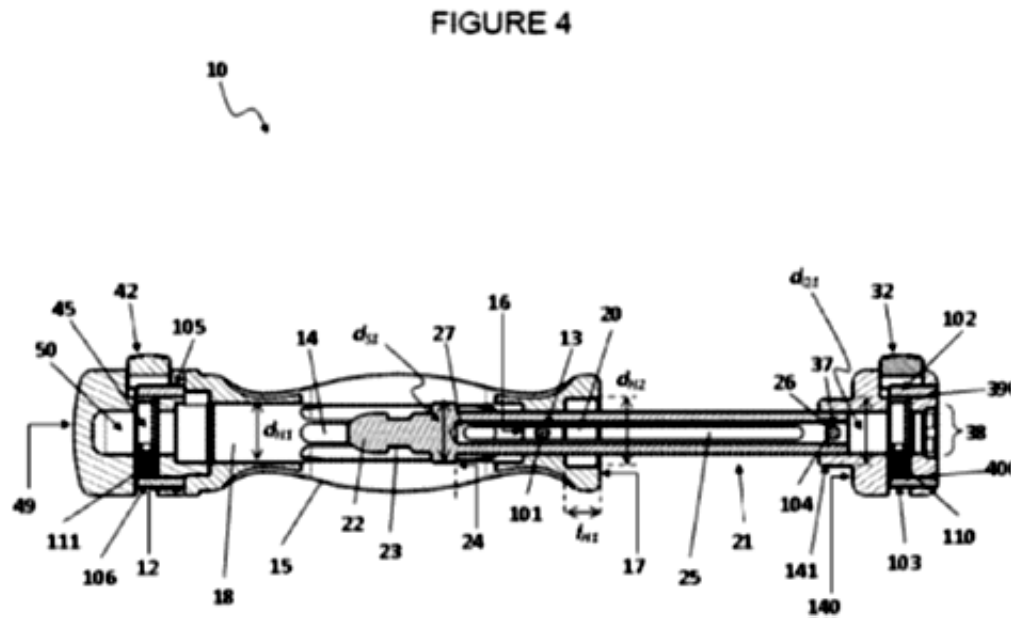


Figure 4 “is a cross-sectional illustration of the all of the components of the universal impactor with slap hammer.” *Id.* at 6:21–22, Fig. 1 (a 3D perspective drawing of the device). Figure 4 shows slap hammer 10, composed of, *inter alia*, central shaft 21, impaction surface 49, proximal

button 42, locking pin 105, spring 111, bulleted tip 22, hollow handle 11 (not numbed in figure) with outer surface 15. *Id.* at 9:14–11:11. “The hollow handle (11) is selectively movable between a first, distal position (shown in Fig 5A) and a second, proximal position (shown in FIGS. 1 and 5B), and is effective to apply a force to the instrument in both the proximal and distal direction.” *Id.* at 11:23–26.

Sharma discloses that:

The mechanical locking mechanism on the other hand is achieved by the locking of proximal tip of central shaft by pressing the proximal button located on proximal impaction end. The mechanical locking mechanism located on said proximal impaction end is selected from a variety of locking mechanisms including spring loaded button, rotating and unlocking screw or a taper lock. The mechanical locking mechanism located on said proximal impaction end passively receives proximal tip end of central shaft when the tip is bulleted, or by positively pressing said mechanical locking mechanism as a toggle key to allow locking in and releasing, when tip of said central shaft is flat. The mechanical locking mechanism located on said proximal impaction end receives proximal tip end of central shaft locking in to facilitate use of said device as impactor device, releasing said proximal tip end of said central shaft on pressing said mechanical locking mechanism to facilitate use of said device as extractor device.

*Id.* at 4:24–5:2. Further, Sharma states that “the central shaft is pushed into the integrated hollow handle [until] the tip at the proximal end of the central shaft clicks into the proximal impaction end locking it into place and thereby turning the device into an impactor,” and when “the proximal button (42) on the proximal impaction end (41) is pressed to release the tip of the central shaft enabling the shaft to move within the integrated hollow handle.” *Id.* at 20:6–16.

E. PETITIONER’S PATENTABILITY CHALLENGES

As summarized above, Petitioner asserts five grounds for the unpatentability of claims 1, 2, 9, and 10 of the ’129 patent. *See supra* Section I.D; *see also* Pet. 3. We review Petitioner’s challenges and Patent Owner’s arguments below. After briefly reviewing the grounds, we address Patent Owner’s arguments.

1. *Ground 1 – Obviousness of Claims 1, 2, 9, and 10 over Compton, Donner, Otte, and Sharma*

Under Ground 1, Petitioner asserts that the combination of the teachings of Compton, Donner, Otte, and Sharma rendered the subject matter of the challenged claims obvious. *See* Pet. 51 *et seq.*

As for the ordinarily skilled artisan’s motivation or reason to combine such teachings, Petitioner asserts that there was “significant overlap in both instrumentation and methodology” among the references, that a desire for greater efficiency would have driven such an artisan to seek combining what were formerly multiple, separate tools into a single tool for SI joint preparation, and that doing so would have led to “predictable improvements in efficiency.” *Id.* at 51–53 (citing Ex. 1004, 4:35–53, 5:1–44; Ex. 1006 ¶¶ 164, 188; Ex. 1007 ¶¶ 56–59; Ex. 1009, 3:1–3; Ex. 1017 ¶¶ 111–113).

Turning to the limitations of independent claim 1, Petitioner maps each limitation to a teaching of the Compton-Donner-Otte-Sharma combination. *Id.* at 54–59. Under this Ground, Petitioner points primarily to Compton as teaching a method of preparing an SI joint for implant as claimed (also noting Donner teaches the same type of procedure using similar components), and as using most of the recited elements of claim 1 for the procedure, e.g., a guide rod or finder device 100 to locate an “insertion point,” retraction guide 122 as the recited “working channel,” and

broach 148 as the recited “abrading device.” *Id.* at 54–59 (citing Ex. 1004, 2:51–3:16, 3:28–45, 3:52–65, 5:1–25, 6:51–59, 7:8–11, 7:42–53, Fig. 3;<sup>13</sup> Ex. 1006 ¶¶ 145, 156, 164–167, 188–190; Ex. 1017 ¶¶ 115, 123, 125, 127, 270). Petitioner notes that Donner teaches that omitting the use of a rotary cutting instrument, such as a drill, in SI joint fusion prep was known. *Id.* at 54, 59 (citing Ex. 1006 ¶ 270; Ex. 1017 ¶ 127).

Regarding the “open tip” and “cutting edge” elements of claim 1, which relate to recited features of the abrading device, Petitioner points to Donner’s teaching of tooling head 52 and its various configurations, such as Figure 22D’s surfaces 196, 198, 218, and edges 216, and also to Otte’s box chisel of rectangular shape with a perimeter open cutting edge 86. *Id.* at 56–57 (citing Ex. 1006 ¶¶ 188–190 (and, by implication, Figs. 19D, 21C, 22D, which are discussed therein); Ex. 1007 ¶¶ 56–57, 64, 66, 68, 72 (and by implication, Figs. 1, 2, 6–10, which are discussed therein)). Petitioner asserts either reference’s tool would be a predictable addition to use with Compton’s methods and structures. *Id.* at 52–53. Petitioner notes that Otte is focused on intravertebral rather than SI joint procedures, but asserts that the two are closely related, making including Otte’s devices in an SI joint preparation obvious. *Id.* (citing Ex. 1017 ¶ 112).

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<sup>13</sup> We note that, at points, Petitioner appears to cite relevant portions of Compton, but instead refers to Exhibit 1003 (i.e., Schifano); we understand this to be clerical error and that those citations should be to Compton. *See* Pet. 55–56. However, one such cite (i.e., Ex. 1003, 20:3–20) cannot be explained by this understanding because Compton does not have 20 columns of disclosure. *See* Ex. 1004. Thus, there is some confusion about Petitioner’s intent in citing evidence under Ground 1.

Regarding the “slide hammer” and “releasing means” elements of claim 1, which are recited features of claim 1’s “slide hammer assembly,” Petitioner asserts that slide/slap hammers were commonly used and including such with Compton’s tools and methods would have been routine. *Id.* at 57 (citing Ex. 1004, 6:51–59; Ex. 1017 ¶ 123). Petitioner points to Donner’s disclosure of a slide hammer assembly 54 for SI joint fusion procedures, and points to Sharma’s disclosure of a slap hammer device as a modular end to attach to chisels or rasps that includes a push button locking mechanism 42 to lock and unlock an impact hammer (handle) 11 to a central shaft 21. *Id.* at 48–57 (citing Ex. 1006 ¶¶ 165–167; Ex. 1009, Abstr., 2:29–32, 3:1–3, 3:7–9, 4:24–32, 9:1–5, 19:15–18, 20:6–16, Figs. 1, 4; Ex. 1017 ¶ 125). Petitioner asserts that adding Sharma’s general purpose, universal slap hammer to Compton’s or Donner’s tools for use in their procedures would be a predictable improvement in efficiency to benefit such tools/procedures. *Id.* at 53, 58 (citing Ex. 1017 ¶¶ 113, 125).

Regarding dependent claims 2, 9, and 10, Petitioner also maps their limitations and elements to the teachings of Sharma and Compton, which Petitioner asserts teach how the slap hammer is used to extract an instrument and that the holes formed by abrading tools can be rectangular to match the implant for which the SI joint is being prepared. *Id.* at 59–60 (citing Ex. 1004, 7:61–8:13, 7:42–53, 7:61–8:13, 8:24–28; Ex. 1009, 2:29–32, 3:1–3).

2. *Ground 2 – Obviousness of Claims 1, 2, 9, and 10 over Schifano, Compton, Martz, and Sharma*

Under Ground 2, Petitioner replaces Ground 1’s Donner and Otte with Schifano and Martz. *Id.* at 60–69. As for a reason to make the prior art combination, Petitioner, similar to Ground 1, asserts that Schifano similarly

is directed to methods and instruments for posterior SI joint fusion and discloses similar instruments as Compton, and that Martz is directed to spinal fusion chisel tools and such procedures are closely related to SI joint fusion surgeries as each deals with vertebral bones and preparing joints between bones by clearing space for an implant. *Id.* at 60–63 (citing Ex. 1003, Abstract, 15:21–34, 19:40–20:2; Ex. 1004, 3:52–65, 7:8–11; Ex. 1008 ¶¶ 2, 25, 93–95, 305; Ex. 1017 ¶¶ 132–134). Petitioner asserts that Martz’s box chisel tool would have been easily and predicably substituted for Schifano’s box chisel and rasp to improve efficiency (one tool rather than two). *Id.* at 62 (citing Ex. 1017 ¶ 134). Including Compton and Sharma in such a combination is asserted to have been obvious for the same reasons as for Ground 1: related tools and uses and improved efficiency. *Id.* at 60–61, 63.

Petitioner also maps the prior art combination to the limitations and elements of independent claim 1, here relying on Schifano as teaching most recited procedure steps and tool elements. *Id.* at 64–68 (citing Ex. 1003, Abstract, 3:15–21, 4:56–67, 8:52–19:26, 19:44–20:20).<sup>14</sup> For example, Petitioner asserts that Schifano discloses the claimed method in disclosing a posterior surgical approach for SI fusion (noting also that Martz teaches an intervertebral preparation, which is similar, and the lack of a drill as a part of such procedure), that Schifano teaches using a pin or wire and dilator to locate an insertion point as claimed, that Schifano teaches a “working

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<sup>14</sup> Similar to our comment at note 13 *supra*, Petitioner, at least once, cites Exhibit 1008 (Martz), where it appears Petitioner intends to cite Exhibit 1003 (Schifano). *See* Pet. 64. We attribute this to clerical error. Greater attention to detail in future filings would be appreciated.

channel” with arms as claimed (and notes Compton also teaches the same), that Schifano teaches the claimed “abrading device” in disclosing a rasp, and that Schifano’s box chisel has an “open tip” and “cutting edge” as claimed. *Id.*

Regarding the “open tip” and “cutting edge” claim elements, Petitioner additionally points to Martz’s disclosure of a chisel tool at Figures 76a–76c and the related written description. *Id.* at 66–67 (citing Ex. 1008 ¶¶ 93, 305–306). Noting that Martz’s tool is disclosed specifically for scraping and cutting spinal disk and vertebrae material to prepare for a spinal implant, Petition asserts this is also relevant for SI joint preparation, and identifies Martz’s box chisel’s open end as the claimed “open tip,” and the edge of the opposing abrading surfaces defining that opening as being the “cutting edge.” *Id.*

As for the claimed “slide hammer” and “releasing means,” again Petitioner points to Sharma’s disclosure, as discussed above. *Id.* at 67; *see supra* Section II.E.1.

As with Ground 1, here Petitioner again maps the prior art combination to the limitations of dependent claims 2, 9, and 10. *Id.* at 68–69. Petitioner again points to Sharma as teaching the slide hammer unlocking limitation, but points to Schifano as teaching the rectangular shape of the cuts to prepare the SI joint to match the implant’s shape. *Id.*

3. *Ground 3 – Obviousness of Claims 1, 2, 9, and 10 over Compton, Martz, and Sharma*

Under Ground 3, Petitioner presents the same case as for Ground 2, but swaps Compton into the prior art combination with Martz and Sharma in place of Schifano. *Id.* at 69–73 (citing Ex. 1004, 7:61–8:13, 8:24–28; Ex. 1008 ¶¶ 2, 25, 93, 305–306; Ex. 1017 ¶¶ 153–154, 156, 163, 165); *see*

*also supra* Sections II.E.1 and II.E.2 (addressing Grounds 1 and 2). Other than this change, there are no critical new points made under this ground not made for Grounds 1 and 2.

4. *Ground 4 – Obviousness of Claims 1, 2, 9, and 10 over Black, Martz, and Sharma*

Ground 4 is similar to Grounds 1–3, but adds Black as the prior art reference of most focus, replacing either Compton or Schifano in this way. Pet. 73–81.

Regarding the ordinarily skilled artisan’s reasons to combine Martz and Sharma with Black, they are similar to those for other prior art combinations asserted under other grounds: the art is directed to SI joint preparation for an implant, or a related surgical procedure, and discloses using similar tools to perform the procedure, and combining several separate tools into a single tool enhances efficiency. *Id.* at 73–72 (citing Ex. 1005, Abstr., ¶¶ 48–49, 71, 76; Ex. 1017 ¶¶ 169–171).

In mapping this prior art combination to independent claim 1, Petitioner asserts that Black discloses a posterior surgical method for SI joint fusion (and noting Martz’s similar procedure) and most of the claimed elements of the tools used therefor. *Id.* at 75–80 (citing, *inter alia*, Ex. 1017 ¶¶ 175, 182, 184). For example, Petitioner asserts that Black discloses joint finder 100 that teaches locating an “insertion point,” Black discloses a working cannula with protrusions/arms and sides shaped for the iliac and sacrum that teaches the claimed “working channel,” Black discloses rasp 1000 that teaches the claimed “abrading device,” and Black’s box chisel 900 teaches an “open tip” and “cutting edge” as claimed, and further Black teaches attaching a slap handle to its chisel 900 and rasp 1000. *Id.* (citing, *inter alia*, Ex. 1005, Abstr., ¶¶ 19, 38–39, 46–50, 66, 71–73, 75–77, 80, 93,

Figs. 3A, 4, 10). In addition to this, Petitioner again asserts that Martz teaches an open-tipped chisel tool with a cutting edge. *Id.* at 78–79. Moreover, Petitioner again asserts that the slap hammer and release mechanism of Sharma would have been obvious to use with Black’s device, as discussed above for other grounds. *Id.* at 79.

Regarding dependent claims 2, 9, and 10, Petitioner maps Sharma’s disclosure of the locking/unlocking slide hammer to the limitations of claims 2 and 10, and maps Black’s disclosure of a rectangular implant and cutting tool to claim 9’s requirements. *Id.* at 80–81 (citing, *inter alia*, Ex. 1005 ¶¶ 19, 45, 52, 71, 76–77, 109).

5. *Ground 5 – Obviousness of Claims 1, 2, 9, and 10 over Black, Donner, and Sharma*

Under Ground 5, Petitioner presents the same case as for Ground 4, but swaps Donner into the prior art combination with Black and Sharma in place of Martz. *Id.* at 81–85 (citing, *inter alia*, Ex. 1006 ¶ 145; Ex. 1017 ¶¶ 188, 201); *see also supra* Sections II.E.1 and II.E.4 (addressing Grounds 1 and 4). Other than this change, there are no critical new points made under this ground not made for Grounds 1 and 4.

6. *Patent Owner’s Preliminary Arguments*

As an initial matter, we find that Petitioner has accounted for the teaching of every step and element of claims 1, 2, 9, and 10 in the asserted prior art combinations and has reasonably shown that the ordinarily skilled artisan would have had reason to combine or modify the prior art references in the ways asserted by Petitioner for the sake of reducing the number of tools needed and to improve efficiency in SI joint implant preparation procedures.

[A]n implicit motivation to combine exists not only when a suggestion may be gleaned from the prior art as a whole, but when the “improvement” is technology-independent and the combination of references results in a product or process that is more desirable, for example because it is stronger, cheaper, cleaner, *faster*, lighter, smaller, more durable, or *more efficient*. Because the desire to enhance commercial opportunities by improving a product or process is universal—and even common-sensical—. . . there exists in these situations a motivation to combine prior art references even absent any hint of suggestion in the references themselves. In such situations, the proper question is whether the ordinary artisan possesses knowledge and skills rendering him *capable* of combining the prior art references.

*Dystar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1368 (Fed. Cir. 2006). We now turn to Patent Owner’s arguments.

*Mr. Drewry’s Declaration*

Patent Owner first argues that we should accord Mr. Drewry’s testimony little or no weight because much of his Declaration is the same or similar to conclusory assertions made in the Petition, “word-for-word.” Prelim. Resp. 6–7.

At this stage of the proceeding, we are unpersuaded by this argument. Although witness declaration testimony that merely parrots back conclusory arguments in a petition may be a concern, on the present record we are not persuaded that this is the case here. Mr. Drewry’s declaration is 109 pages long, 98 if one does not count the pages introducing the witness, discussing background information, or its appendix, thus, it is substantially longer than the Petition and not merely coextensive. Ex. 1017. Moreover, Patent Owner has not sufficiently explained exactly what it is about Mr. Drewry’s testimony that is merely conclusory and unsupported. At trial, Patent Owner

will have opportunity to depose Mr. Drewry and potentially expose any shortcomings of his testimony.

*“Releasing Means”*

Patent Owner’s next argument is that the prior art does not teach the “releasing means” limitation of claim 1, and that Petitioner does not provide sufficient particularity on this matter in the Petition. Prelim. Resp. 20–24.

We have interpreted the claim term “releasing means” largely in line with Patent Owner’s proposed construction. *Compare supra* Section II.B.2, *with* Prelim. Resp. 16. We find Patent Owner’s main arguments on this point to be focused on (1) Petitioner’s alleged lack of detail in explaining exactly how Sharma teaches this limitation and (2) Patent Owner’s implicit assertion that the “releasing means” must directly connect the hammer sleeve to a base structure also attaching the hammer apparatus to the abrading tool such that Sharma’s locking mechanism, which according to Patent Owner connects Sharma’s hammer sleeve to its shaft rather than such a base, does not teach this limitation. Prelim. Resp. 20–24. At this stage of the proceeding, we are unpersuaded by these arguments.

The Petition explains Sharma’s disclosure and cites the reference under each Ground as the basis for teaching the claimed “releasing means.” Pet. 48–50, 58, 67, 71–72, 79, 84. At this point, there is no dispute that Sharma teaches a slide/slap hammer and a mechanism for locking the slide/slap hammer sleeve in place or unlocking it for use. There is also no dispute that Sharma’s locking mechanism is button 42 in a preferred embodiment and that Sharma further discloses, more generally, that the locking mechanism can include a “spring loaded button, [an] unlocking screw[,], or a taper lock” (*see* Ex. 1009, 4:24–28), which we find at this point

arguably teaches at least one of “a mating threaded connection, a quick disconnect attachment, a depressible tab, a latch, a clasp, a clip, a clamp,” i.e., options for the corresponding structure (*see* Ex. 1017 ¶¶ 98–102, 125).

What is disputed at this point is whether Sharma’s locking mechanism connects the hammer sleeve to a base. As we noted above when interpreting “releasing means,”

per the [’129 patent’s] Specification, the base of the slide hammer assembly is a structure connected to the slide hammer assembly’s shaft structure, and the hammer sleeve of the slide hammer assembly (which can slide along the shaft) is releasably connected (connectable) to that base. It is our understanding, on the preliminary record, that the base is a structure to which the sliding hammer sleeve is engaged when locked to prevent its movement.

*Supra* Section II.B.2 (citing Ex. 1001, 2:59–66, 6:66–7:47, Figs. 16, 17, 21).

Other than this, we find no restrictions on what a base is in relation to the “releasing means” limitation. Therefore, at this stage of the proceeding, we find no reason the structure for the “releasing means” should exclude Sharma’s arrangement of hammer sleeve, locking mechanism, and shaft or that the structure where Sharma’s hammer sleeve locks to its shaft should not be considered a base, per our interpretation of the claim.

Of course, the parties may explore this issue further at trial.

*Donner and “Open Tip”*

Patent Owner next argues over Ground 1, that Donner does not teach claim 1’s “open tip” limitation. Prelim. Resp. 24–25. On this point, Patent Owner’s argument is that Donner’s Figure 22A, cited by Petitioner, is a solid member without openings and, therefore, cannot have an “open tip” as claimed. *Id.* at 24. However, in the very next sentence of the Preliminary

Response, Patent Owner acknowledges that Donner's Figure 23D illustrates an embodiment of a chisel with an open tip. *Id.* at 25.

We have interpreted the claim language "open tip" above to mean "the tip of the abrading head is open to an interior void of the abrading head." *See supra* Section II.B.1.

Donner's Figure 23D indisputably shows this, and at this point in the proceeding, we find that Donner's Figure 22D embodiment also illustrates that the abrading head has an open tip because that embodiment has an interior void to which the abrading head is open, i.e., the space above surface 196 and between the side cutting elements 192. *See supra* Section II.D.4 (discussing Donner). Thus, while Donner's Figure 22A may not disclose an "open tip," at this point in the proceeding, it appears that limitation is taught by Donner.

In any event, the Petition does not rely solely upon Donner for the "open tip" limitation, but also points to Otte under Ground 1. Pet. 56–57. At this point, it also appears that Otte teaches an abrading head with an open tip as a box chisel with a textured outer surface and a hollow interior open to the exterior on the sides and front of the tool. *See supra* Section II.D.5 (discussing Otte).

#### *Donner and "Cutting Edge"*

Also addressing Ground 1, Patent Owner argues that Donner also fails to teach claim 1's "cutting edge" limitation. Prelim. Resp. 26. Focusing again on Donner's Figures 22A–22D, Patent Owner argues that Donner's cutting elements 216 are not (exactly) on the "leading edge" at the very end of the tool. *Id.* This argument is also not persuasive at this point.

It is not clear to us at this stage of the proceeding that Donner's cutting elements 216, even in the configuration of Donner's disclosed elements argued by Patent Owner, are not at the "tip" of Donner's tool. Figures 22A–22D of Donner depict the cutting elements (216) as being located at the tool's distal end. This is true even for the configuration shown in Figure 22A. Thus, at this stage of the proceeding, it appears that Donner teaches a "cutting edge disposed at the leading edge of the open tip," as recited in claim 1.

Moreover, the Petition does not rely solely upon Donner for the "cutting edge" limitation, but also points to Otte under Ground 1. Pet. 56–57. At this point, it also appears that Otte teaches an abrading head as a box chisel with a textured outer surface and cutting edge 86 along its most distal structure. *See supra* Section II.D.5 (discussing Otte).

*Martz and "Open Tip"*

Turning to Grounds 2–5 together, Patent Owner next argues that Martz's chisel tool also does not teach claim 1's "open tip" limitation. Prelim. Resp. 26–28. Patent Owner's argument is that Martz's Figure 76c shows an embodiment of a chisel tool with only two surfaces and leading edges bordering an open space therebetween and not a fully enclosed opening having sides all around. *Id.* at 27. This argument is not persuasive.

Undercutting Patent Owner's argument is Patent Owner's acknowledgment that other embodiments disclosed by Martz, e.g., at Figure 73, teach a chisel tool having an open tip enclosed and defined by four sides. *Id.* at 27–28.

Similar to our preliminary analysis of Donner over a similar argument, above, we see no reason why Martz's Figure 76c embodiment

does not illustrate that the chisel tool has an open tip because that embodiment has an interior void to which the tool's end is open, i.e., the space inside members 368 and 368'. *See supra* Section II.D.5 (discussing Martz).

*Martz and “Cutting Edge”*

Concerning Grounds 2–5, Patent Owner also argues that Martz's chisel tool's cutting edges are for cutting spinal disc material, not bone tissue and, thus, are not the cutting edges of claim 1. Prelim. Resp. 29–32. Patent Owner's argument is that, although Martz discloses distal cutting edges 369, 369', these are not configured to or suitable for cutting SI joint bone, but only disc material. *Id.* We are not persuaded.

Martz is focused on preparing an intervertebral space for an implant, rather than an SI joint for the same. *See supra* Section II.D.6 (discussing Martz). Thus, Martz's tool is likewise adapted to accomplish the former, specifically. However, the structure/tool of Martz, per the Petition, is incorporated into the SI joint preparation tools and for use in the SI joint preparation methods of Schifano, Compton, and Black (as well as Donner). Pet. 3, 60–85. Thus, in such a combination, the Martz chisel would have been used to prepare an SI joint, which is the joint connecting the iliac and sacrum *bones*, not disc material. On the preliminary record before us we do not have doubt that Martz chisel could accomplish such a task. *See, e.g.*, Ex. 1017 ¶¶ 133–135.

*Combining or Modifying Prior art*

Patent Owner next argues that Petitioner has not provided sufficient reasons that the ordinarily skilled artisan would have combined or modified the “disjointed assortment of separate surgical tools” or explained

particularly enough just how the prior art would have been combined. Prelim. Resp. 32–37, 42–45. We are not persuaded by this argument.

Under each ground for unpatentability, Petitioner has included a designated section addressing why the person of ordinary skill in the art would have combined the asserted prior art and modified one in view of the others and that efficiency would be gained by combining multiple tools and steps into a single tool to be used to accomplish the same procedure. Pet. 51–53, 60–63, 69–70, 73–74, 81–82. Petitioner identifies the asserted prior art as analogous art in asserting that they are all in the same field of endeavor — vertebral joint preparation for implants. *Id.*

Moreover,

The motivation-to-combine analysis is a flexible one. “[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,” but the “analysis ‘need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.’”

*Intel*, 61 F.4th at 1379–80. “[I]f there’s a known technique to address a known problem using ‘prior art elements according to their established functions,’ then there is a motivation to combine,” because *KSR* explains that “‘if a technique has been used to improve one device [or method], and a person of ordinary skill in the art would recognize that it would improve similar devices [or methods] in the same way, using the technique is obvious unless its actual application is beyond his or her skill.’” *Id.* at 1380. If addressing a known problem, the prior art combination need not be “the *best* option, only . . . a *suitable* option.” *Id.* (quoting *Intel*, 21 F.4th at 800 (emphasis original)). And, the desire for increased *efficiency*, which would

seem to be accomplished by reducing the number of tools needed for a surgery as asserted by Petitioner, has been expressly recognized by the Federal Circuit as a motivating reason to combine/modify prior art. *See Dystar*, 464 F.3d at 1368.

At this stage of the proceeding, we find no shortcomings in Petitioner's rationale for combining the asserted prior art.

*Particularity*

Patent Owner next argues that, in general, the Petition is not sufficiently particular as to the unpatentability grounds because the asserted grounds are too ambiguous and we would be required to scour the asserted references to piece together obviousness grounds. Prelim. Resp. 37–41. This argument is not persuasive.

Often, a petition leaves something to be desired in terms of particularity. Greater specificity and detail are always preferred and, sometimes, a petition is so ambiguous or suggests such a number of potential prior art combinations that it is simply untenable and institution is denied for that reason. Here, however, Petitioner has set forth five reasonably specific grounds for unpatentability premised on five specific prior art combinations. And, although some allegations could be clearer, we do not find Petitioner's allegations so ambiguous as to not be able to discern the alleged grounds for unpatentability or discern upon what prior art they are premised.

If the Petition indeed fails to establish that the prior art teaches or suggests any claimed step or element in some way not apparent on this preliminary record, Patent Owner may argue and present evidence on this at trial.

*Compton, Drilling, and Inoperability*

Patent Owner also argues that Compton's methods require a drill be used before any using a broach to first form a circular hole and then make it diamond-shaped, and that it would not be possible to make such a diamond-shaped hole if the drill step is omitted and, instead, Donner's abrading head is used. Prelim. Resp. 45–47. This argument is not persuasive.

We agree with Patent Owner that Compton's method uses a drill to make a first hole in an SI joint and then uses a broach tool to change the shape of that hole to fit an implant. *See supra* Section II.D.2 (discussing Compton). However, we discern Petitioner's position to be that, upon combining the prior art as asserted, there would be no need for a drill because other prior art, e.g., Schifano, Black, Donner, Otte, and Martz, either teaches a complete implant preparation method without mentioning the use of a drill or discloses that using a drill is optional. *See supra* Section II.D.

“Non-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references. . . . [The reference] must be read, not in isolation, but for what it fairly teaches in combination with the prior art as a whole.” *In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986). Here, it is a combination of prior art that is asserted, not just Compton, and some of that art does not require a drill or other rotary tool.

Thus, Petitioner's showing is sufficient at this stage of the proceeding. If combining the prior art as asserted in the Petition would truly render Compton's methods and tools inoperable, Patent Owner may present argument and evidence on this at trial.

*Factually Erroneous Foundation*

Finally, Patent Owner argues that Petitioner has relied upon a factually erroneous premise as the foundation for its case because, for example, Compton does not use separate tools, but instead teaches using a drill and then using a broach to make and then shape a hole. Prelim. Resp. 48–49. This argument is not persuasive.

At this stage of the proceeding, the premise of Patent Owner’s argument is confusing. Patent Owner on the one hand identifies that Compton requires (1) a drill and (2) a broach for making a hole in an SI joint in preparation for an implant, but on the other hand argues that these are not “separate tools.”

Moreover, we understand that the foundation of Petitioner’s rationale for combining and modifying the prior art is that the tools used in each reference are similar and used for similar purposes, so substituting one for another would have been obvious. *See, e.g.*, Pet. 51. We further understand that the rationale for combining several tools into one for efficiency’s sake, as asserted by Petitioner, relates to the references teaching, on occasion, using several tools (e.g., a broach, a rasp, and a chisel) to create a void for an implant where one would be more efficient, or having to use one tool (e.g., a chisel) to create such a void and then having to attach a second tool (e.g., a slap hammer) to remove the first, where having these combined would be more efficient. *See, e.g., id.* at 51–53.

On the current record, we discern no shortcomings with such rationale.

### III. CONCLUSION

Petitioner demonstrates a reasonable likelihood of prevailing at trial in showing that at least one of claims 1, 2, 9, and 10 of the '129 patent is unpatentable over the cited prior art. Our decision derives from our review of the preliminary record before us. Accordingly, we institute *inter partes* review of each challenged claim the '129 patent on each of the grounds asserted by Petitioner. This decision does not reflect a final determination on the patentability of the claims.

### ORDER

Accordingly, it is hereby:

ORDERED that the Petition is granted and we institute *inter partes* review of claims 1, 2, 9, and 10 of the '129 patent based on the grounds asserted in the Petition.

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Patent 11,020,129 B2

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