

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AURIS HEALTH, INC.,
Petitioner,

v.

INTUITIVE SURGICAL OPERATIONS, INC.,
Patent Owner.

IPR2019-01448
Patent 6,246,200 B1

Before GEORGE R. HOSKINS, TINA E. HULSE, and
SCOTT C. MOORE, *Administrative Patent Judges*.

HOSKINS, *Administrative Patent Judge*.

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

I. INTRODUCTION

Auris Health, Inc. (“Petitioner”) has filed a Petition (Paper 1, “Pet.”) pursuant to 35 U.S.C. §§ 311–319 to institute an *inter partes* review of claims 1, 10–12, 14, and 17 of U.S. Patent No. 6,246,200 B1 (“the ’200 patent”).

Intuitive Surgical Operations, Inc. (“Patent Owner”) has filed a Preliminary Response (Paper 7, “Prelim. Resp.”).

Applying the standard set forth in 35 U.S.C. § 314(a), which requires demonstration of a reasonable likelihood that Petitioner would prevail with respect to at least one challenged claim, we institute, on behalf of the Director (37 C.F.R. § 42.4(a)), an *inter partes* review to determine whether Petitioner demonstrates by a preponderance of the evidence that claims 14 and 17 are unpatentable. We do not institute review as to claims 1 and 10–12, which have been disclaimed by Patent Owner. 37 C.F.R. § 42.107(e) (2019).

II. BACKGROUND

A. *Real Parties in Interest and Related Proceedings*

Petitioner identifies Auris Health, Inc., Ethicon, Inc., and Johnson & Johnson, as the real parties-in-interest for Petitioner. Pet. 1. Patent Owner identifies Intuitive Surgical Operations, Inc., and Intuitive Surgical, Inc., as the real parties-in-interest for Patent Owner. Paper 4, 1. The parties identify one judicial matter as related to this proceeding: *Intuitive Surgical, Inc. and Intuitive Surgical Operations, Inc. v. Auris Health, Inc.*, Civil Action No. 18-cv-1359-MN (D. Del.) (“the District Court Litigation”). Pet. 1; Paper 4, 1.

B. The '200 Patent

The '200 patent concerns robotic surgery devices and methods.

Ex. 1001, Abstract, 1:12–15. Figure 1 of the '200 patent is reproduced here:

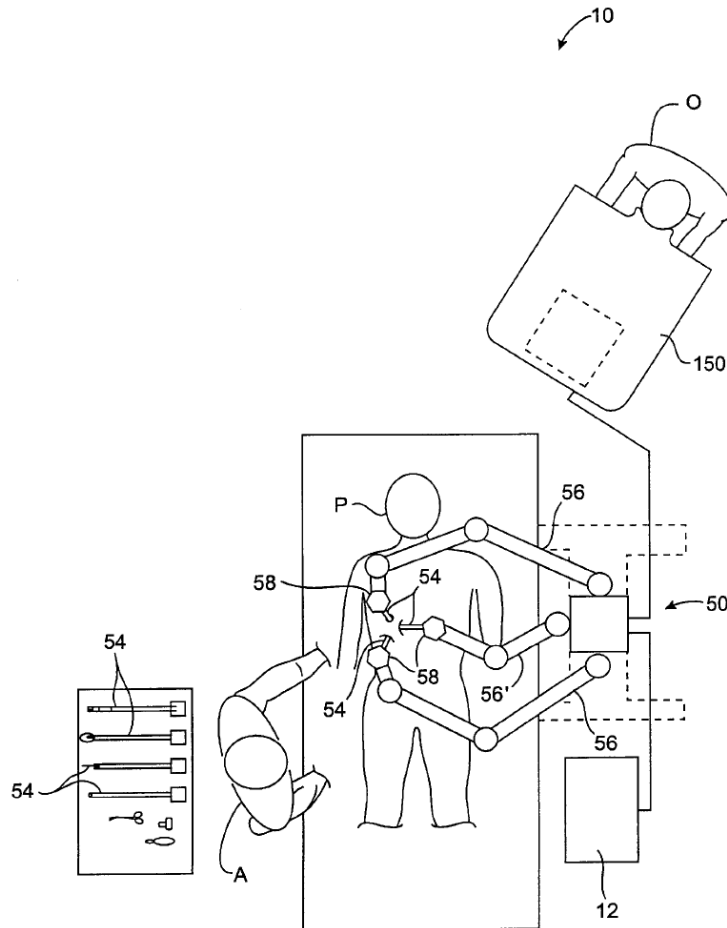


FIG. 1
Figure 1 of the '200 Patent
(plane view of robotic surgical system).

Id. at 5:3–4. The robotic surgical system of Figure 1 is operated by surgeon operator O, with help from assistant A, to perform surgery on patient P. *Id.* at 6:55–64. Cart 50 supports three robotic manipulator arms 56, 56', 58. *Id.* at 7:1–12. Typically, the central arm supports an endoscope (i.e., a camera), and the two outer arms support tissue manipulation tools. *Id.* at 5:57–65,

joints 84 separated by rigid links 86, permitting horizontal adjustment of linkages 56. *Id.* at 8:17–19.

Each linkage 56 may be manipulated in either of two ways. First, operator O may use console 150 to manipulate linkage 56 robotically, via motors (not shown in Figure 1). *Id.* at 6:55–61, 7:58–60, 13:27–49. Second, assistant A may manually grasp a linkage 56 to manipulate it, by pushing or pulling the linkage 56. *Id.* at 6:61–64, 13:41–44.

Brakes 104 on column 80 (*see id.* at Fig. 4A) may lock each linkage 56 at a selected vertical position, and brakes 124 at each rotary joint 84 (*see id.* at Fig. 5) may lock each linkage 56 at a selected horizontal position. *Id.* at 8:62–65, 9:51–61. Each brake 124 “prevents rotation about the joint [84] unless the brake is released.” *Id.* at 9:51–53. “In other words, the brake is normally on (so that the joint is in a fixed configuration).” *Id.* at 9:53–61, 3:4–14. Each positioning linkage 56 has a single actuation button 130 that releases all the brakes 124 on the linkage 56, to allow manual manipulation of the linkage. *Id.* at Fig. 5, 3:4–14, 10:20–29, 10:45–49.

In typical usage, operator O or assistant A will initially manipulate each positioning linkage 56 in a “pre-positioning” step, performed prior to physical interaction with patient P, to place robotic manipulators 58 and their associated surgical instruments 54 in the proper orientation with respect to patient P. *Id.* at 6:61–64, 13:27–49. Then, each positioning linkage 56 “remains in a fixed configuration while manipulating tissue,” using robotic manipulator 58 as “a [motor-]driven portion which is actively articulated under the direction of surgeon’s console 150” to manipulate tissue. *Id.* at 7:5–12, 11:39–59.

Sensors are placed at each sliding joint 82, and at each rotary joint 84, so that a processor may track the movements and relative positions of each linkage 56. *Id.* at 8:66–9:22, 10:1–2, 10:39–44. The system may thereby “avoid interference as the implements are manipulated during surgery” such as by “prevent[ing] two arms from striking each other,” which “avoid[s] damage to the robotic structure and potential injury to the patient.” *Id.* at 6:18–24.

C. The Claims of the '200 Patent

The '200 patent lists thirty-one claims. Ex. 1001, 15:11–18:47. The Petition challenges claims 1, 10–12, 14, and 17. *See* Pet. 3–4. As discussed below, Patent Owner has disclaimed claims 1 and 10–12, leaving claims 14 and 17 at issue in this proceeding. *See* Prelim. Resp. 2; Ex. 2001. Claims 14 and 17 are both independent. Claim 14 recites:

14. A support structure for supporting a first robotic surgical manipulator relative to a second robotic surgical manipulator, each surgical manipulator coupled to a servomechanism so as to robotically manipulate tissues of a patient body with a surgical end effector, the support structure comprising:
 - a base coupled to the first manipulator;
 - a manipulator support movably supporting the second manipulator relative to the base;
 - an articulated linkage having a plurality of joints coupling the base to the manipulator support so as to allow manual movement of the second manipulator relative to the base;
 - a brake system releasably inhibiting movement of the joints, wherein the brake system can release the joints supporting the second manipulator upon actuation of a single actuator;
 - and

a sensor system coupling the manipulator support to the servomechanism, the sensor system transmitting position signals to the servomechanism, the servomechanism calculating a position or orientation of the first manipulator relative to the second manipulator using the signals.

Ex. 1001, 16:31–54. Claim 17 is identical to claim 14, except claim 17 additionally specifies that the brake system is “*biased toward a locked configuration to prevent inadvertent movement of the manipulator by releasably inhibiting inadvertent movement of the joints,*” and that the sensor system is “*coupled to the joints so that the position signals comprise joint configuration signals of the joints.*” *Id.* at 16:66–17:26 (emphases added to identify additions versus claim 14).

D. Prior Art and Asserted Grounds

Petitioner asserts claims 1, 10–12, 14, and 17 are unpatentable, based on the following four grounds. *See* Pet. 3–4.

Claims Challenged	35 U.S.C. §	References
1, 10–12	103	Faraz ¹ , Ohm ²
1, 10–12	103	Faraz, Ohm, Sackier ³
14, 17	103	Faraz, Lathrop ⁴ , Tarn ⁵
14, 17	103	Faraz, Lathrop, Tarn, Sackier

¹ Ex. 1004, U.S. Patent No. 5,824,007, issued Oct. 20, 1998.

² Ex. 1005, U.S. Patent No. 5,784,542, issued July 21, 1998.

³ Ex. 1009, J.M. Sackier & Y. Wang, *Robotically assisted laparoscopic surgery*, *Surgical Endoscopy*, 8:63–66 (1994).

⁴ Ex. 1006, U.S. Patent No. 5,555,897, issued Sept. 17, 1996.

⁵ Ex. 1007, T.J. Tarn et al., *Coordinated Control of Two Robot Arms*, 1986 IEEE International Conference on Robotics and Automation, pp. 1193–1202 (1986). Portions of our citation here are borrowed from Petitioner’s citation (Pet. iii), and are not reflected within the document itself (Ex. 1007).

III. ANALYSIS

A. *Claim Construction*

We interpret the claims of the '200 patent “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b).” 37 C.F.R. § 42.100(b) (2019). This “includ[es] construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” *Id.*

1. *Claim Preambles (Claims 14 and 17)*

Claims 14 and 17 recite identical preambles. Ex. 1001, 16:31–36, 16:66–17:4. The Petition and the Preliminary Response raise two claim construction issues relating to the first and second “robotic surgical manipulators” in the preambles, which we consider in turn. We then address the meaning of the term “surgical end effector” in the preambles.

a) *Whether “first robotic surgical manipulator” and “second robotic surgical manipulator” Are Limiting*

The Petition seeks to establish that, “to the extent the preamble of claim 14 [and claim 17] is limiting,” the subject matter is disclosed by Faraz. Pet. 59–60, 70. Patent Owner takes the affirmative position that “the preambles of claims 14 and 17 are limiting” in reciting first and second robotic surgical manipulators, because those terms provide antecedent basis for other features recited in the bodies of the claims. Prelim. Resp. 17–18.

Based on the present record, we agree with Patent Owner’s position. The bodies of claims 14 and 17 require “a base coupled to *the* first manipulator,” referring to “*a* first robotic surgical manipulator” in the

preamble. Ex. 1001, 16:37, 17:5 (emphases added). The claim bodies also require “*the* second [robotic surgical] manipulator” to be (i) movably supported by the manipulator support relative to the base, and (ii) movable manually relative to the base via the articulated linkage, referring to “*a* second robotic surgical manipulator” in the preamble. *Id.* at 16:38–44, 17:6–12 (emphases added). The claim bodies further require a servomechanism for “calculating a position or orientation of the first [robotic] manipulator relative to the second [robotic] manipulator.” *Id.* at 16:51–54, 17:23–26. Based on the number and nature of recited interactions between the first and second robotic surgical manipulators and other elements of the claimed support structure, we conclude the manipulators are limiting. “[T]he preamble constitutes a limitation when the claim(s) depend on it for antecedent basis.” *In re Fought*, 941 F.3d 1175, 1178 (Fed. Cir. 2019) (quoting *C.W. Zumbiel Co., Inc. v. Kappos*, 702 F.3d 1371, 1385 (Fed. Cir. 2012), citing *Catalina Mktg. Int’l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002) and other case law).

b) Meaning of “manipulator”

Petitioner asserts, in support of contending Faraz discloses the subject matter of the preambles in claims 14 and 17, that the claim term “*manipulator*” “include[s] *an actively driven portion of a robotic arm that holds a surgical end effector.*” Pet. 59 (Petitioner’s emphasis partly modified) (citing Ex. 1001, 7:5–9, 7:36–38; and Ex. 1003⁶ ¶¶ 178–179).

⁶ All citations herein to the Declaration of Dr. William Cimino (Ex. 1003) refer to the corrected version of the Declaration filed on October 15, 2019, with prior approval of the Board.

Petitioner states “[c]laim 1 recites that same concept” where claim 1 recites “*a plurality of driven joints coupled to a servomechanism for moving the end effector so as to manipulate tissues.*” *Id.* at 59–60 (emphasis by Petitioner); *see also* Ex. 1001, 15:17–19 (pertinent limitation of claim 1). Therefore, “[a]s explained for claim 1,” Petitioner contends Faraz includes the first and second “manipulators” of claim 14 as two wrists 24 that can be driven by motors “to permit robotic control of [Faraz’s] end effector,” which is surgical implement 28. *Id.* at 60 (citing Ex. 1004, 6:27–29, Fig. 2A; Ex. 1003 ¶ 180); *see also id.* at 24–27 (analysis for claim 1).

Patent Owner reads Petitioner’s foregoing argument as construing the “manipulator” term in claim 14 to “have an equivalent scope to the ‘driven joints’ in claim 1.” Prelim Resp. 19. Patent Owner expressly “does not concede” to such a construction. *Id.* Instead, Patent Owner argues that “even under Petitioner’s [alleged] interpretation” of the term “manipulator” in claims 14 and 17, Faraz’s wrists 24 cannot be the manipulators because Faraz does not disclose or make obvious the use of motors to drive wrists 24 “*for moving the end effector so as to manipulate tissues,*” as recited in claim 1. *Id.* at 21 (emphasis by Patent Owner); *id.* at 19–22. In Patent Owner’s view: “It is one task to motorize a set-up joint to *prepare* for a surgical procedure, but it is quite another to motorize a joint to *perform* a surgical procedure.” *Id.* at 22 (emphases added).

We are not persuaded that Petitioner relies upon the claim construction that Patent Owner alleges. The Petition pertinently states only that the term “manipulator” in claims 14 and 17 includes “an *actively driven* portion of a robotic arm that *holds* a surgical end effector.” Pet. 59 (emphases added). The Petition then pertinently asserts Faraz’s wrists 24

are such manipulators because they “*permit robotic control*” of surgical implements 28. *Id.* at 60 (emphasis added). Thus, Petitioner contends merely that the manipulators of claims 14 and 17 must be driven via a servomechanism to move the end effectors, and does not contend that the manipulators must *additionally* be driven via the servomechanism *while the end effectors are manipulating tissue* during a surgical operation.

We construe the term “robotic surgical manipulator” in claims 14 and 17 to mean a portion of a support structure that may be robotically driven to position a surgical end effector in relation to a patient body. *See, e.g.*, Ex. 1001, 1:37–45, 1:66–2:3, 3:2–19, 5:48–56, 7:5–13, 7:36–8:10; Ex. 1003 ¶¶ 178–181.

We do not construe this term more narrowly to require that the robotic surgical manipulator must additionally be robotically driven while the surgical end effector is manipulating tissue. In that regard, we recognize that the common preamble of claims 14 and 17 recites “each surgical manipulator [is] coupled to a servomechanism so as to robotically manipulate tissues of a patient body with a surgical end effector.” Ex. 1001, 16:33–36, 17:1–3. This verbiage, if limiting, could potentially be read to require the more narrow construction. Nonetheless, on the present record, Petitioner has not clearly advocated for the more narrow construction, and Patent Owner expressly disputes the more narrow construction. Therefore, we will not deny institution by applying the more narrow construction. If needed, we can re-visit this issue during trial.

c) “surgical end effector”

Petitioner proposes that we construe the term “surgical end effector” of the common preamble of claims 14 and 17 “to refer to a device at [the] end of a surgical instrument for manipulating (cutting, grasping or otherwise acting on) body tissue.” Pet. 11 (citing Ex. 1001, 1:66–2:3, 5:50–56; Ex. 1003 ¶¶ 46–48). Petitioner also states “the Board likely will not need to adopt” this construction based on the prior art teachings at issue here. *Id.* at 10.

The Preliminary Response does not address Petitioner’s proposed claim construction of the “surgical end effector” term, and does not propose a claim construction for this term.

On November 20, 2019 — after the Petition and the Preliminary Response were filed in this proceeding — a *Markman* hearing was held in the District Court Litigation. A transcript of the *Markman* hearing has been filed in this proceeding as Exhibit 1013, by agreement of the parties and with prior approval from the Board.

On December 6, 2019, a telephone conference was held between the parties and the Board to discuss the *Markman* hearing, and how it might impact several *inter partes* review proceedings. *See* Ex. 1014 (transcript of telephone conference). Petitioner’s counsel and Patent Owner’s counsel agreed that no supplemental briefing was needed in this particular proceeding (IPR2019-01448) to address the *Markman* hearing. *Id.* at 4:17–5:22. Patent Owner’s counsel nonetheless suggested that we “should consider the District Court’s construction pursuant to the Board rules,” and further indicated that if the District Court’s claim constructions “are not relevant to [the] institution decision, then they would have no impact.” *Id.* at

5:22–6:11; *see* 37 C.F.R. § 42.100(b) (“Any prior claim construction determination concerning a term of the claim in a civil action . . . that is timely made of record in the *inter partes* review proceeding will be considered.”).

We have considered the *Markman* hearing transcript. The only term in claims 14 and 17 of the ’200 patent that was addressed by the District Court appears to have been “surgical end effector.” Ex. 1013, 4:1–14:25 (parties’ arguments), 115:15–120:16 (District Court’s claim construction). The District Court rejected Petitioner’s construction, which was materially the same as Petitioner’s proposal here. *Id.* at 7:10–10:19 & 118:9–11 (Petitioner’s argument); *id.* at 118:12–120:16 (District Court’s claim construction). The District Court construed the term to mean, more broadly, “an instrument used in surgery designed to interact with the environment.” *Id.* at 118:17–19.

We need not construe the term “surgical end effector” in order to determine whether to institute here. This is because, even applying Petitioner’s relatively narrow construction, which would require “acting on body tissue,” Faraz’s surgical implements 28 are surgical end effectors, because implements 28 may be “manipulators” or “suturing devices” for example. Ex. 1004, 3:13–16; *see* Pet. 18–21. All the more so, Faraz’s surgical implements 28 are surgical end effectors under the District Court’s relatively broader construction of “interact with the environment.” Thus, we do not comment further on this issue here. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (per curiam) (claim terms need to be construed “only to the extent necessary

to resolve the controversy” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

2. *Remaining Claim Terms*

We determine no further explicit constructions of any claim terms are needed to resolve the issues presented by the arguments and evidence of record. *See Nidec, supra*. This includes the term “brake system,” for which Petitioner offers a construction even though Petitioner also recognizes “the Board likely will not need to adopt” the construction. Pet. 10.

B. *Law of Obviousness*

A patent claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of nonobviousness, if made available in the record. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

C. *Level of Ordinary Skill in the Art*

Petitioner contends a person having ordinary skill in the art pertaining to the ’200 patent is “a person with a good working knowledge of robotics and medical devices such as robotic surgical systems . . . gained by an

undergraduate education in electrical engineering, mechanical engineering, robotics, biomedical engineering, or a related field of study, along with about two years of experience in academia or industry studying or developing robotics or medical devices such as robotic surgical systems.” Pet. 8–9; Ex. 1003 ¶ 28. Also, “[t]his description is approximate; varying combinations of education and practical experience also would be sufficient.” Pet. 9; Ex. 1003 ¶ 28.

The Preliminary Response does not take a position as to the level of ordinary skill in the art.

We determine, based on the current record, that the level of ordinary skill proposed by Petitioner is consistent with the ’200 patent and the asserted prior art. For purposes of the present decision, we therefore conclude a person of ordinary skill in the art would hold an undergraduate degree in electrical engineering, mechanical engineering, robotics, biomedical engineering, or a related field of study, and also have about two years of experience in academia or industry studying or developing robotics or medical devices.

*D. Obviousness over Faraz and Ohm, and
Obviousness over Faraz, Ohm, and Sackier*

Grounds one and two in the Petition assert claims 1 and 10–12 of the ’200 patent are unpatentable under 35 U.S.C. § 103 as having been obvious over Faraz and Ohm (Pet. 11–44), and as having been obvious over Faraz, Ohm, and Sackier (*id.* at 44–49).

In response, Patent Owner states: “In an effort to narrow the issues for adjudication, and without any concession or admission of any kind, Patent Owner has disclaimed claims 1 and 10–12.” Prelim. Resp. 2 (citing

Ex. 2001). Thus, the Preliminary Response “addresses only” grounds three and four in the Petition. *Id.* (citing 37 C.F.R. § 42.107(e); *General Electric Co. v. United Techs. Corp.*, IPR2019-00212, Paper 12 at 7 (PTAB May 13, 2019)).

A disclaimer under 35 U.S.C. § 253(a) is “considered as part of the original patent” as of the date on which it is “recorded” in the Office.

35 U.S.C. § 253(a) (2018). For a disclaimer to be “recorded” in the Office, the disclaimer must:

- (1) Be signed by the patentee, or an attorney or agent of record;
- (2) Identify the patent and complete claim or claims, or term being disclaimed. . . . ;
- (3) State the present extent of patentee’s ownership interest in the patent; and
- (4) Be accompanied by the fee set forth in [37 C.F.R.] § 1.20(d).

37 C.F.R. § 1.321(a) (2019); *see also Vectra Fitness, Inc. v. TNWK Corp.*, 162 F.3d 1379, 1382 (Fed. Cir. 1998) (holding § 253 disclaimer is immediately “recorded” on the date the USPTO receives a disclaimer meeting the requirements of § 1.321(a), and no further action is required in the USPTO).

The record establishes that Patent Owner disclaimed claims 1 and 10–12 of the ’200 patent on November 12, 2019. The record reflects that a completed Form PTO/SB/43 (“DISCLAIMER IN PATENT UNDER 37 CFR 1.321(a)”) was filed on that date, as part of the prosecution history file of the ’200 patent. *See* Ex. 2001. The disclaimer form was signed by Frank Nguyen, a registered patent attorney and the Vice President of IP and Licensing for Patent Owner, and identifies Patent Owner as the assignee of the ’200 patent. *See id.* The form also identifies claims 1 and 10–12 as

being disclaimed. *See id.* The form further reflects payment of the requisite fee. *See id.* Thus, Patent Owner’s filing of Exhibit 2001 in the prosecution history file of the ’200 patent on November 12, 2019 met the requirements for an effective statutory disclaimer.

Pursuant to our Rules: “The patent owner may file a statutory disclaimer,” in which event “[n]o *inter partes* review will be instituted based on disclaimed claims.” 37 C.F.R. § 42.107(e) (2019). Further, as a result of the statutory disclaimer, claims 1 and 10–12 are no longer regarded as claims challenged in the Petition. *See Vectra*, 162 F.3d at 1383 (“This court has interpreted the term ‘considered as part of the original patent’ in section 253 to mean that the patent is treated as though the disclaimed claims never existed.” (citing *Guinn v. Kopf*, 96 F.3d 1419, 1422 (Fed. Cir. 1996))); *see also Sanofi-Aventis U.S., LLC v. Dr. Reddy’s Labs., Inc.*, 933 F.3d 1367, 1372–75 (Fed. Cir. 2019) (disclaimer of claims during district court patent infringement litigation “mooted any controversy” over the disclaimed claims, ending the Article III case or controversy requirement for district court jurisdiction).

In considering our rules and Federal Circuit precedent, we conclude we cannot institute a trial on claims that have been disclaimed, and, thus, no longer exist. This conclusion is consistent with other panel decisions in *inter partes* review proceedings addressing near identical circumstances as we do here. *See, e.g., Gen. Elec. Co. v. United Techs. Corp.*, IPR2017-00491, Paper 9 at 2–3 (PTAB July 6, 2017) (precedential) (not instituting review where patent owner had disclaimed all challenged claims); *Intuitive Surgical, Inc. v. Ethicon LLC*, IPR2018-01248, Paper 7 at 2 n.1, 9–10 (PTAB Feb. 7, 2019); *Apple Inc. v. Qualcomm Inc.*, IPR2018-01279,

Paper 11 at 2 n.1, 6–7 (PTAB Feb. 1, 2019); *Unified Patents, Inc. v. Bradium Techs. LLC*, IPR2018-00952, Paper 31 at 14–15 (PTAB Dec. 20, 2018); *Vestas-American Wind Tech., Inc. v. Gen. Elec. Co.*, IPR2018-01015, Paper 9 at 2 n.1, 12–14 (PTAB Nov. 14, 2018). We share the view expressed by the panels in those other proceedings that our conclusion here is consistent with the statutory scope of *inter partes* review as laid out in 35 U.S.C. §§ 311(b) and 318(a) and is not at odds with the Supreme Court’s decision in *SAS Institute, Inc. v. Iancu*, 138 S. Ct. 1348 (2018). *See, e.g., id.* at 1357 (recognizing that “the claims challenged ‘in the petition’ will not always survive to the end of the case; some may drop out thanks to the patent owner’s actions”). Accordingly, we treat claims 1 and 10–12 as having never been part of the ’200 patent, such that Petitioner cannot seek *inter partes* review of those claims.

E. Obviousness over Faraz, Lathrop, and Tarn

Petitioner asserts claims 14 and 17 of the ’200 patent are unpatentable under 35 U.S.C. § 103 as having been obvious over Faraz, Lathrop, and Tarn. Pet. 49–74. Patent Owner opposes. Prelim. Resp. 2–3, 8–23. We have reviewed Petitioner’s and Patent Owner’s arguments, and the evidence of record. Based on the evidence of record, Petitioner has demonstrated a reasonable likelihood of prevailing on its assertions as to claims 14 and 17. We begin our analysis with brief summaries of Faraz, Lathrop, and Tarn, then we address the parties’ contentions as to obviousness.

1. *Faraz Disclosure*

Faraz discloses an adjustable support stand for assisting a surgeon to perform laparoscopic surgery. *See* Ex. 1004, Abstract, 1:1–8. One such stand 10 is illustrated in Figure 1, which is reproduced here:

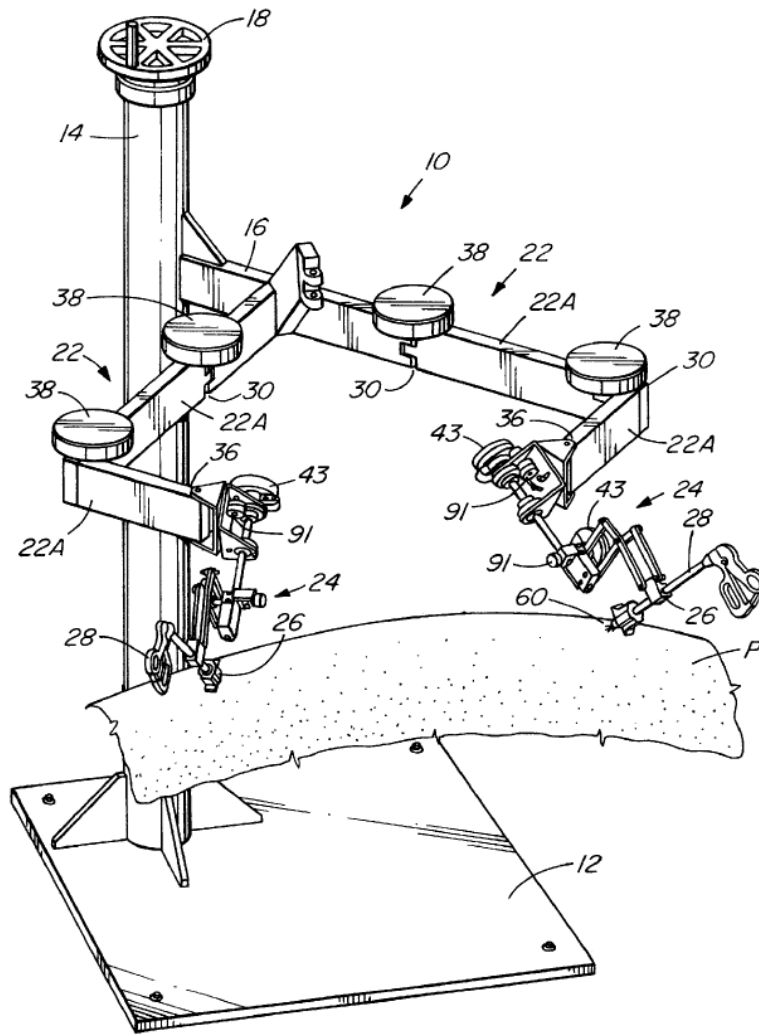


FIG. 1

**Figure 1 of Faraz
(perspective view of surgical support stand 10).**

Id. at 2:39–40, 2:56. Faraz’s stand 10 has base 12 supporting pillar 14, and arm support 16 slidably attached to pillar 14 to be fixed at a desired

elevation above patient P, either by hand or with “a power assisted drive (not shown).” *Id.* at 2:56–3:4. Arm support 16 in turn supports two arms 22, each comprising arm segments 22A connected by pivot joints 30, so that ends 36 of arms 22 may be positioned as desired in a horizontal plane. *Id.* at 3:5–6, 3:28–38. Each joint 30 has “locking means such as a pneumatic brake 38,” locked by supplying air pressure thereto, and “[w]hen brakes 38 are not locked ends 36 of arms 22 may be freely moved.” *Id.* at 3:59–62, 4:9–11.

Wrists 24 are attached at respective ends 36 of each arm 22. *Id.* at 3:12–13. Figure 2A is a detailed view of one wrist 24, and is reproduced here:

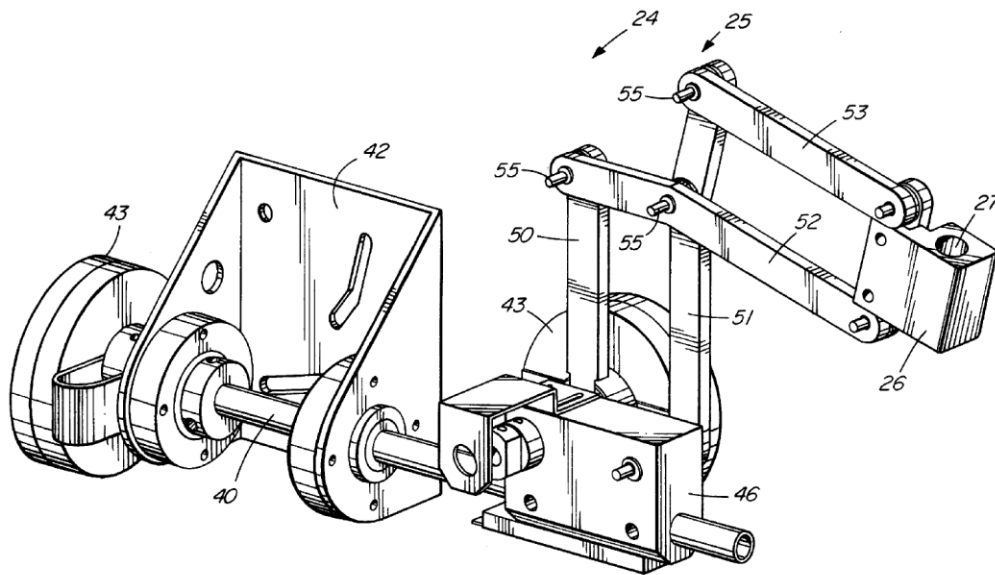


FIG. 2A
Figure 2A of Faraz
(perspective view of wrist 24).

Id. at 2:41–42, 4:36. Wrist 24 includes bracket 42 which is mounted to arm 22 (not shown in Figure 2A), with an actuated joint and a controller (also not shown) for adjusting the angle between wrist 24 and arm 22. *Id.* at

3:12–13, 3:45–50, 4:36–37. Member 40 of wrist 24 is mounted in bearings for rotation within bracket 42, and may be locked in rotational position by pneumatic brake 43. *Id.* at 4:36–42, 4:55–56. Linkage 25 is mounted on rotatable member 40, and comprises four arms 50–53 interfacing at pivot joints 55. *Id.* at 4:57–65. Implement holder 26 at the distal end of linkage 25 receives surgical implement 28 (shown in Figure 1). *Id.* at 3:12–16. A second pneumatic brake 43 may lock linkage 25 in any given configuration. *Id.* at Fig. 2A, 4:36–42, 6:15–22.

“Stand 10 is well adapted for use as a basis for a robotic surgery device.” *Id.* at 6:23–24. Thus, “motors or other actuators could be connected using known means to drive and control the motion of any or all of the joints in stand 10.” *Id.* at 6:27–29. Also, “the position of a surgical implement 28 can be readily monitored by affixing angular position sensors 91 to each of joints 30, member 40, and at least one of the pivot points of linkage 25.” *Id.* at 6:24–27.

2. *Lathrop Disclosure*

Lathrop discloses an adjustable support structure for assisting a surgeon to perform laparoscopic surgery. *See* Ex. 1006, Abstract, 1:8–12, 1:60–67. One such surgical support structure 10 is illustrated in Figures 1 and 1A, which are reproduced here (on the next page):

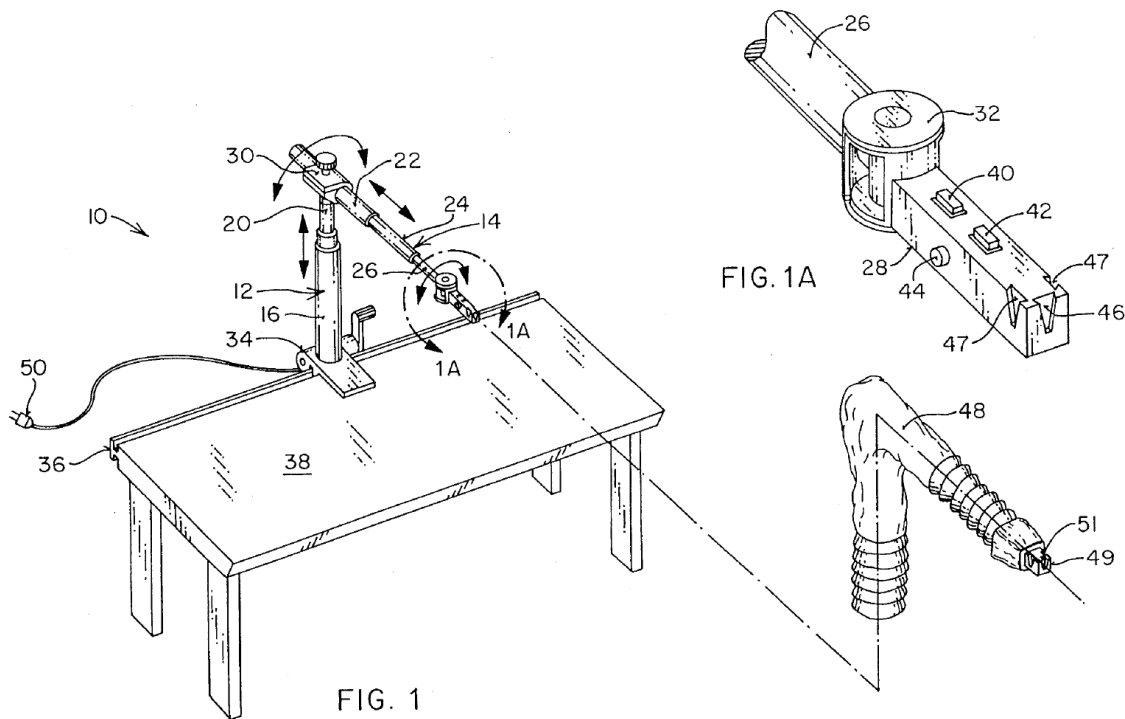
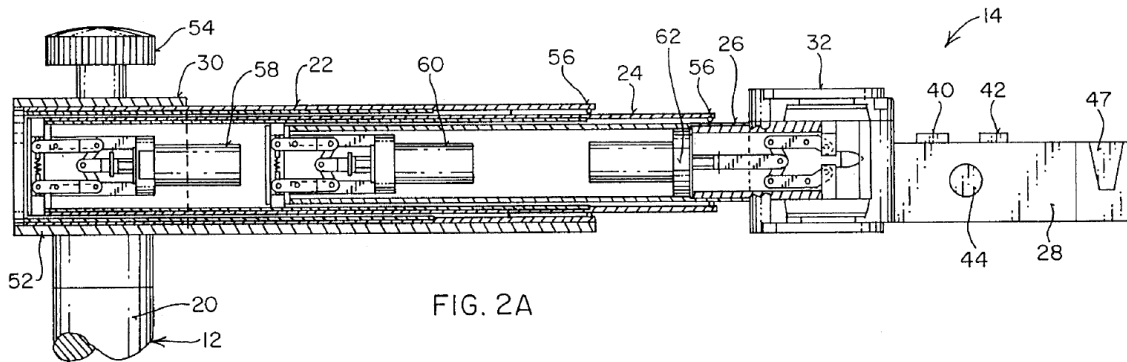


FIG. 1
FIGURES 1 AND 1A OF LATHROP
(perspective views of surgical support structure 10).

Id. at 4:32–36, 6:46–49. Structure 10 comprises telescoping vertical post 12 and telescoping horizontal arm 14, which are adjusted to position end segment 28 of arm 14 (and a surgical instrument mounted thereon, not shown in Figures 1 and 1A) relative to a patient resting on surgical table 38.

Id. at 6:46–56, 10:16–19. Arm 14 includes rotatable joint 32 to permit additional flexibility in positioning end segment 28 of arm 14. *Id.* at 6:58–59.

Figure 2A is a cross-sectional view of horizontal arm 14, and is reproduced here (on the next page):



**Figure 2A of Lathrop
(cross-sectional view of horizontal arm 14).**

Id. at 4:38–39, 7:17–18. Locking mechanisms 58 and 60 are electrically operated via respective solenoids to lock telescoping segments 22, 24, 26 of arm 14 in place with respect to each other. *Id.* at 7:47–50, 8:16–33. An additional locking mechanism 62 is electrically operated via another solenoid to lock a selected orientation of end segment 28 relative to telescoping segment 26. *Id.* at 7:50–54, 8:56–9:5.

Button switch 44 (seen best in Figures 1A and 2A) “provide[s] actuation of the locking mechanisms.” *Id.* at 6:60–65, 9:9–11. Specifically, support structure 10 may be re-positioned “by grasping the horizontal arm [14] and depressing switch 44 to release the locking mechanisms, then rotating or extending the arm to the desired location.” *Id.* at 10:9–13. “Once the arm [14] is in position, locking actuator switch 44 is released so as to re-lock the arm in position.” *Id.* at 10:13–15. Switch 44 is “convenient[ly] . . . located in the immediate vicinity of the surgical working area, most desirably immediately above the working area,” which “allows the arm to be quickly positioned and locked using one hand.” *Id.* at 2:2–5, 2:67–3:8, 3:26–28, 3:39–49.

3. *Tarn Disclosure*

Tarn discloses a “control method . . . for the coordinated control of *two robot arms*.” Ex. 1007, 1193 (Abstract) (emphasis added). “The coordination among robots is essential in many industrial and other applications.” *Id.* at 1193 (Introduction ¶ 1). Therefore, Tarn aims “to design a control system which is able to command both arms in such a way that two arms operate in a kinematically and dynamically coordinated fashion and respond to the working environment *without collisions*.” *Id.* at 1193 (Introduction ¶ 2) (emphasis added). In particular, Tarn “let[s] the two arms work in the master/slave mode,” and the slave arm “will follow [the master arm] with a constant offset distance.” *Id.* at 1198.

4. *Claim 14*

Petitioner provides arguments and evidence, including the Declaration of Dr. William Cimino, in support of contending claim 14 is unpatentable as having been obvious over Faraz, Lathrop, and Tarn. Pet. 49–70; Ex. 1003 ¶¶ 74–77, 86–91, 177–216. Patent Owner provides arguments in opposition. Prelim. Resp. 2–3, 8–23.

a) “14. A support structure for supporting a first robotic surgical manipulator relative to a second robotic surgical manipulator, each surgical manipulator coupled to a servomechanism so as to robotically manipulate tissues of a patient body with a surgical end effector, the support structure comprising: . . . ”

Petitioner contends Faraz’s Figure 1 illustrates a support structure (i.e., surgical support stand 10) for supporting first and second robotic surgical manipulators (i.e., first and second wrists 24) coupled to respective servomechanisms (i.e., motors). *See* Pet. 60 (“each wrist . . . and its end

effector of Faraz would correspond to the ‘*robotic surgical manipulators*’ of claim 14”); *id.* at 17, 21–29, 59–60; Ex. 1003 ¶¶ 97–99, 106–122, 177–181. In Petitioner’s view, Faraz indicates wrists 24 are “manipulators” as recited in claim 14, because Faraz discloses “motors or other actuators could be connected using known means to drive and control the motion of *any or all* of the joints in stand 10.” Ex. 1004, 6:23–29 (emphasis added); Pet. 17, 21–23, 26–27, 59–60. Petitioner particularly asserts the identified “any or all joints” includes joints 40, 55 of wrists 24. Pet. 26–27, 59–60 (citing Ex. 1004, 4:36–39, 4:66–5:7, 6:13–29); Ex. 1003 ¶¶ 98, 109–110, 114–117, 179–180. Petitioner contends Faraz also discloses “that *some of* the joints” in stand 10, “such as the wrist joints depicted in Figure 2A, *could be* motorized.” Pet. 60 (emphases added) (citing Ex. 1004, 6:27–29); *id.* at 26–27 (further citing Ex. 1004, 4:36–39, 4:66–5:7, 6:13–21); Ex. 1003 ¶¶ 117, 180. Petitioner further contends Faraz’s wrists 24 each hold a surgical end effector (i.e., surgical implement 28) that manipulates tissue. Pet. 18–23, 26–27 (citing Ex. 1004, 1:60–2:1, 2:56–57, 3:13–33, 6:15–21); Ex. 1003 ¶¶ 102–103, 117–118.

Patent Owner firstly argues “nowhere does Faraz render obvious driven joints for moving the end effector to manipulate tissue, as Petitioner alleges is required for” claim 14. Prelim. Resp. 3, 19–23. For the reasons provided above, we disagree with Patent Owner’s reading of the Petition in this regard. *See supra* Section III.A.1.b. We therefore do not address this argument further.

Patent Owner secondly argues Petitioner errs in relying on Faraz as disclosing “only a particular subset of *Faraz’s* joints,” or “*only certain joints*,” may be robotically driven by a motor. Prelim. Resp. 21–22 (citing

Ex. 1004, 6:23–29) (emphases by Patent Owner). Patent Owner especially objects to Petitioner’s argument that Faraz discloses “some of the joints, such as the wrist joints depicted in Figure 2A, *could be motorized* . . . to permit robotic control of the end effector.” *Id.* at 22 (quoting Pet. 60) (emphasis by Patent Owner). In support, Patent Owner asserts “[w]hat ‘could have been’ merely employs hindsight to determine whether the claimed invention was technically feasible,” which “does not address the central question . . . ‘whether a [skilled artisan] . . . would have been *led to make the combination* recited in the claims.’” *Id.* at 22–23 (quoting *NPF Ltd. v. Smart Parts, Inc.*, 187 F. App’x 973, 979 (Fed. Cir. 2006), and citing *InTouch Techs., Inc. v. VGo Commc’ns, Inc.*, 751 F.3d 1327, 1352 (Fed. Cir. 2014)).

The specific disclosure of Faraz at issue here is: “motors or other actuators *could be* connected using known means to drive and control the motion of *any or all* of the joints in stand 10.” Ex. 1004, 6:27–29 (emphases added). Thus, where Petitioner asserts that Faraz discloses “some of the joints, such as the wrist joints depicted in Figure 2A, *could be* motorized” (Pet. 60 (emphasis added)), Petitioner merely paraphrases the verbiage found in Faraz itself. In the context of Faraz, this “could be” verbiage is a disclosure that, in some embodiments, the joints will be motorized. Ex. 1004, 6:23–29. Further, Faraz’s express statement that “any or all” of the joints in stand 10 may be driven by motors (Ex. 1004, 6:27–29) supports Petitioner’s contention that Faraz indicates only “some of” the joints may be driven by motors (Pet. 60).

The present case is unlike the facts presented in the *NPF* and *InTouch* decisions cited by Patent Owner. In both of those cases, an expert witness

regards, to demonstrate a reasonable likelihood of prevailing on the challenge to claim 14 as having been obvious over Faraz, Lathrop, and Tarn.

c) “ . . . an articulated linkage having a plurality of joints coupling the base to the manipulator support so as to allow manual movement of the second manipulator relative to the base . . . ”

Petitioner contends Faraz’s support structure 10 comprises an articulated linkage (i.e., the wrist 24 comprising the second manipulator, and its associated arm 22) having a plurality of joints (i.e., joints 40, 55 of wrist 24, and joints 30 of arm 22) coupling base 12 to the manipulator support. *See* Pet. 21–23, 62–63 (citing Ex. 1004, 1:60–2:1, 3:27–33, 6:15–21); Ex. 1003 ¶¶ 106–108, 110, 187–190. According to Petitioner, each arm 22 of Faraz’s articulated linkage allows manual movement of its associated manipulator wrist 24 relative to base 12. *See* Pet. 30–33, 36–39, 63 (citing Ex. 1004, 3:28–33, 3:50–51, 3:59–62, 4:5–10, 6:8–14, 6:27–29, 10:20–24); Ex. 1003 ¶¶ 125–132, 143–152, 189.

Patent Owner does not challenge Petitioner’s foregoing assertions at this preliminary stage of the proceeding. We determine Petitioner has shown sufficiently that Faraz discloses the recited subject matter in these regards, to demonstrate a reasonable likelihood of prevailing on the challenge to claim 14 as having been obvious over Faraz, Lathrop, and Tarn.

d) “ . . . a brake system releasably inhibiting movement of the joints, wherein the brake system can release the joints supporting the second manipulator upon actuation of a single actuator . . . ”

Petitioner contends Faraz’s support structure 10 comprises a brake system (i.e., brakes 38) releasably inhibiting movement of joints 30. *See* Pet. 36–39, 63 (citing Ex. 1004, 3:28–33, 3:59–62, 4:5–10, 6:8–14,

6:27–29); Ex. 1003 ¶¶ 143–148, 191–192. Petitioner concedes, however, that “Faraz does not expressly disclose use of a single actuator to release the brakes,” as is required by claim 14. Pet. 64; *see also id.* at 38 (“Faraz does not expressly disclose the form of actuator for releasing the brakes.”).

Petitioner asserts that modifying Faraz to employ a single brake release actuator would have been obvious to do, based on Faraz alone, or based on Faraz and Lathrop together. We address each assertion in turn.

(1) *Obviousness based on Faraz Alone*

Petitioner asserts a person of ordinary skill in the art would have been “motivated to use a single actuator (e.g., a button or switch) to release the brakes” of Faraz, based on Faraz alone. Pet. 38, 64; Ex. 1003 ¶¶ 151, 193.

Patent Owner argues Faraz does not instruct or motivate a person of ordinary skill in the art “to make any changes to *Faraz*’s system related to a brake release button” or “actuator.” Prelim. Resp. 26 (citing Ex. 1004, 6:27–29).

We conclude the present record is insufficient to establish the obviousness, based on Faraz alone, of using a single actuator to release Faraz’s brake system. The disclosures cited by Petitioner in relation to Faraz’s brake system pertinently establish only that each joint 30 is equipped with pneumatic brake 38 to lock articulation of arms 22. Ex. 1004, 3:59–62, 4:5–10, 6:8–14. The cited disclosures do not identify how the brakes are released, much less identify an actuator for releasing brakes 38 by controlling air pressure delivered to brakes 38. *Id.* Such evidence, alone, is insufficient to establish the obviousness of employing “a single actuator” to release Faraz’s brakes 38, as required by claim 14.

Dr. Cimino’s testimony in support of obviousness in this regard is not persuasive. Dr. Cimino testifies that a person of ordinary skill in the art “would have” used a single “button or switch” actuator to release Faraz’s brake system. Ex. 1003 ¶¶ 115, 151, 193–194. This testimony is unsupported by citation to record evidence, such as the Faraz disclosure, demonstrating knowledge in the prior art of a single button or switch actuator to release brakes. *Id.* The testimony is, therefore, deficient. *See, e.g., K/S HIMPP v. Hear-Wear Techs., LLC*, 751 F.3d 1362, 1365–66 (Fed. Cir. 2014) (“the Board was correct to require record evidence to support an assertion that the structural features of [the claims at issue] were known prior art elements”).

Thus, on the present record, we determine Petitioner has failed to show a motivation to modify Faraz to include a single brake release actuator, based on Faraz alone, to demonstrate a reasonable likelihood of prevailing on the challenge to claim 14 as having been obvious over Faraz, Lathrop, and Tarn.

(2) *Obviousness based on Faraz and Lathrop*

Petitioner additionally relies on Lathrop as “teach[ing] use of a single actuator to release the brakes” of a surgical support structure. Pet. 64–65. In particular, Petitioner contends Lathrop discloses a single switch 44 to release locking mechanisms 58, 60 and thereby allow support structure 10 to be re-positioned manually. *See* Pet. 51–52, 64–65 (citing Ex. 1006, 2:67–3:8, 3:43–45, 6:2–6, 6:63–65, 8:8–9:16, 9:26–53, 10:7–16); Ex. 1003 ¶¶ 64–66, 195. According to Petitioner, Lathrop reflects that using a single switch to release multiple locking mechanisms beneficially provides “ease of use,” so

it would have been obvious to utilize such a single switch to release Faraz's multiple brakes 30. *See* Pet. 52, 56–57, 64–65 (citing Ex. 1006, 2:67–3:8, 10:7–16); Ex. 1003 ¶¶ 66, 74–77, 86–88, 195–198.

Patent Owner does not challenge Petitioner's foregoing assertions at this preliminary stage of the proceeding. We determine Petitioner has shown sufficiently that Faraz discloses the brake system of claim 14 except for the "single actuator" limitation, which would have been obvious to implement in Faraz based on Lathrop, to demonstrate a reasonable likelihood of prevailing on the challenge to claim 14 as having been obvious over Faraz, Lathrop, and Tarn. *See* Ex. 1006, 2:67–3:8, 10:7–16 (placing switch 44 at distal end of horizontal arm 14 allows the physician to "align the distal end of the horizontal arm over a desired location using a single hand which both actuates the switch and manipulates the end of the arm").

e) " . . . a sensor system coupling the manipulator support to the servomechanism, the sensor system transmitting position signals to the servomechanism, the servomechanism calculating a position or orientation of the first manipulator relative to the second manipulator using the signals. "

Petitioner contends Faraz's support structure 10 comprises a sensor system (i.e., position sensors 91) coupling the manipulator support to Faraz's servomechanism, and transmitting position signals to Faraz's servomechanism. *See* Pet. 33–34, 65–66 (citing Ex. 1004, 6:24–27); Ex. 1003 ¶¶ 133–137, 199–201. Patent Owner does not challenge Petitioner's foregoing assertion at this preliminary stage of the proceeding, and we determine the cited evidence sufficiently supports Petitioner's assertion to justify institution of trial.

Petitioner next asserts that modifying Faraz to use sensor 91 signals to calculate a position or orientation of one manipulator wrist 24 relative to the other manipulator wrist 24 would have been obvious to do, based on Faraz and admissions in the '200 patent, or based on Faraz and Tarn together. We address each assertion in turn.

(1) *Obviousness based on Faraz and Admissions in the '200 Patent*

Petitioner contends a person of ordinary skill in the art “would . . . have *known based on Faraz’s teachings* how to configure” Faraz’s servomechanism to calculate a position or orientation of one manipulator wrist 24 relative to the other manipulator wrist 24, “even though Faraz does not explicitly describe such calculations.” Pet. 66 (emphasis added); Ex. 1003 ¶¶ 135–137, 202–205. In support, Petitioner asserts “[t]he '200 patent admits that coordinate system transformations are prior art,” and contends a person of ordinary skill in the art “would have known how to calculate the position and orientation of each manipulator separately, using well-known coordinate system transformations.” Pet. 66 (citing Ex. 1001, 2:10–15); Ex. 1003 ¶¶ 202–205. Petitioner concludes “Faraz thus renders . . . obvious” the claimed calculation. *Id.*

Patent Owner argues the Petition fails to establish the obviousness of modifying Faraz to perform the claimed calculation, based on the combination of Faraz and the '200 patent’s purported admission(s). *See* Prelim. Resp. 2, 9–14. According to Patent Owner, even if Petitioner is correct that the '200 patent disclosure admits “that coordinate system transformations were generally known,” still Petitioner must “establish a motivation to implement coordinate system transformations in *Faraz’s*

system, which Petitioner has not done.” *Id.* at 11–12 (citations omitted). Patent Owner further asserts Petitioner’s reliance on Faraz in this regard improperly presents “general conclusions about what is ‘basic knowledge’ or ‘common sense’ as a replacement for documentary evidence for core factual findings in a determination of patentability.” *Id.* at 12–14 (quoting *K/S HIMPP*, 751 F.3d at 1366, and citing the PTAB Trial Practice Guide Update (Aug. 2018), at 5).

We conclude the present record is insufficient to establish the obviousness, based on Faraz and the cited ’200 patent disclosure, of calculating a position or orientation of one manipulator wrist 24 relative to the other manipulator wrist 24, as required by claim 14. The Faraz disclosure cited by Petitioner in relation to sensors 91 pertinently establishes only that sensors 91 are used to “monitor[]” “[t]he position of a surgical implement 28.” Ex. 1004, 6:24–28. The cited disclosure does not disclose or suggest making the specific calculation required by claim 14. *Id.* Meanwhile, the ’200 patent disclosure cited by Petitioner describes only that a computer processor can maintain an “alignment between hand input devices of the controller with the image of the surgical end effectors displayed on the monitor using coordinate system transformations.” Ex. 1001, 2:10–15. Petitioner does not explain how this disclosure would have led to the proposed modification of Faraz to calculate a position or orientation of one manipulator wrist 24 relative to the other manipulator wrist 24.

Dr. Cimino’s testimony in support of obviousness in this regard is not persuasive. The testimony largely focuses on establishing that the modification could have been achieved, without providing the requisite

reason for achieving it. *See* Ex. 1003 ¶¶ 202–205. Dr. Cimino does, however, testify that a person of ordinary skill in the art would have recognized “the desirability of performing [the] calculation” required by claim 14, because it “is a first step towards programming the system to avoid collisions between the two manipulators” and thereby “improv[e] patient safety.” *Id.* ¶ 204. We appreciate that the claimed calculation is one variable that can be tracked as part of an algorithm to avoid manipulator collisions. However, the only evidentiary support to be found in Faraz and the ’200 patent for performing the claimed calculation at all is in the ’200 patent, not Faraz. *See, e.g.*, Ex. 1001, 6:18–24. Thus, Dr. Cimino’s testimony in this specific regard is tainted by hindsight. *See, e.g., K/S HIMPP, supra.*

On the present record, we determine Petitioner has failed to show a sufficient motivation to modify Faraz to calculate a position or orientation of one manipulator wrist 24 relative to the other manipulator wrist 24, based on Faraz and the cited ’200 patent disclosure, to demonstrate a reasonable likelihood of prevailing on the challenge to claim 14 as having been obvious over Faraz, Lathrop, and Tarn.

(2) *Obviousness based on Faraz and Tarn*

Petitioner additionally relies on Tarn as disclosing “details on how to calculate the relative positions or orientations” of two robot arms operating in the same space and coordinating on the same job. Pet. 53–56, 66–70; Ex. 1003 ¶¶ 67–73, 206–216. In particular, according to Petitioner, Tarn’s control algorithm “operat[es] on the ***difference between outputs of the two robots***, minus [a] constant offset distance.” Pet. 68 (emphasis by Petitioner)

(quoting Ex. 1007, 1198); Ex. 1003 ¶ 212. Thus, Petitioner concludes Tarn discloses calculating a position or orientation of a first manipulator relative to a second manipulator, as recited in claim 14. Pet. 68–69 (citing Ex. 1007, 1199–1200); Ex. 1003 ¶¶ 212–215. Patent Owner does not challenge Petitioner’s foregoing assertions at this preliminary stage of the proceeding, and we determine the cited evidence sufficiently supports Petitioner’s assertions to justify institution of trial.

Petitioner next contends that, based on Faraz’s teaching that support structure 10 “can be automated” as a robotic surgery device, it would have been obvious from Tarn to implement the automation by “coordinat[ing] control of the two robotic arms [22] . . . to ensure patient safety by avoiding collisions.” Pet. 57–58 (citing Ex. 1007, 1193); Ex. 1003 ¶¶ 74–77, 89–91. In particular, according to Petitioner, a person of ordinary skill in the art “would have had no difficulty adapting Tarn’s kinematics for use in Faraz.” Pet. 58; Ex. 1003 ¶ 91.

Patent Owner argues Petitioner “fails to present legally sufficient evidence to show how and why a skilled artisan *would* have combined” Faraz and Tarn in the manner claimed. Prelim. Resp. 2–3 (emphases by Patent Owner), 10, 14. In Patent Owner’s view, Faraz’s disclosure that support structure 10 “‘can be automated’ is not a motivation to (1) proceed with an automated stand, and (2) use the particular automation features disclosed in Tarn,” particularly absent evidence establishing “any advantage to the system disclosed in Tarn.” *Id.* at 14–15. According to Patent Owner, Tarn’s calculations of the relative position and orientation of the end effectors on two robotic arms “was limited to *three total joints*,” and “Petitioner fails to provide any explanation of how Tarn’s teaching for three

joints would apply to” Faraz’s multitude of joints. *Id.* at 15–16 (emphasis by Patent Owner) (citing Tarn, 1199, 1201).

Patent Owner’s rebuttal is not persuasive, on the present record. Tarn discloses that calculating the relative position or orientation of two robot arms permits the arms to be manipulated in a coordinated manner to avoid collisions. Ex. 1007, 1193 (Introduction ¶¶ 1–2). That is a sufficient motivation to modify Faraz’s system to calculate the position or orientation of one manipulator wrist 24 relative to the other manipulator wrist 24. Further, Dr. Cimino testifies that a person of ordinary skill in the art “would have been able to adapt Tarn’s kinematic transformation concepts for use in Faraz.” Ex. 1003 ¶ 91. On the present record, we find that testimony to be credible. There is no record evidence to support the contrary position taken in the Preliminary Response.

For the foregoing reasons, we determine Petitioner has shown sufficiently that Faraz discloses the sensor system of claim 14 except for “calculating a position or orientation of the first manipulator relative to the second manipulator,” which would have been obvious to implement in Faraz based on Tarn, to demonstrate a reasonable likelihood of prevailing on the challenge to claim 14 as having been obvious over Faraz, Lathrop, and Tarn.

f) Conclusion as to Claim 14

Based on the foregoing arguments and evidence presently in the record, Petitioner has demonstrated a reasonable likelihood of prevailing on the challenge to claim 14 as unpatentable for having been obvious over Faraz, Lathrop, and Tarn. We, therefore, institute a review to proceed to a final written decision on that challenge, based on a fully developed record.

5. *Claim 17*

Petitioner provides arguments and evidence, including the Declaration of Dr. William Cimino, in support of contending claim 17 is unpatentable as having been obvious over Faraz, Lathrop, and Tarn. Pet. 70–74; Ex. 1003 ¶¶ 74–77, 86–91, 217–230. In addition to the analysis of the common subject matter with claim 14 set forth above, Petitioner contends it would have been obvious to modify Faraz’s brake system to include the additional brake system requirements of claim 17 based on Lathrop (Pet. 71; Ex. 1001 ¶¶ 222–224), and Faraz discloses the additional sensor system requirements of claim 17 (Pet. 71–74; Ex. 1001 ¶¶ 225–229).

Patent Owner does not challenge Petitioner’s contentions as to claim 17, other than attacking Petitioner’s analysis of the common subject matter with claim 14, as discussed above. *See, e.g.*, Prelim. Resp. 9.

We determine Petitioner has demonstrated a reasonable likelihood of prevailing on the challenge to claim 17 as having been obvious over Faraz, Lathrop, and Tarn. We, therefore, institute a review to proceed to a final written decision on that challenge, based on a fully developed record.

F. Obviousness over Faraz, Lathrop, Tarn, and Sackier

Petitioner asserts claims 14 and 17 of the ’200 patent are unpatentable under 35 U.S.C. § 103 as having been obvious over Faraz, Lathrop, Tarn, and Sackier. Pet. 74–76. Patent Owner opposes. Prelim. Resp. 3–4, 23–30. We have reviewed Petitioner’s and Patent Owner’s arguments, and the evidence of record. Based on the evidence of record, Petitioner has demonstrated a reasonable likelihood of prevailing on its assertions as to claims 14 and 17. We first consider Patent Owner’s contention that

Petitioner has failed to show Sackier is prior art to the '200 patent, then we briefly summarize Sackier, and finally we address the parties' contentions as to obviousness.

1. Whether Sackier Is Prior Art to the '200 Patent

Petitioner contends Sackier is prior art to the '200 patent, because "Sackier was published in 1994 in the journal *Surgical Endoscopy*." Pet. 44. According to Petitioner, the *Surgical Endoscopy* journal "was in public circulation" in 1994, and the specific issue containing Sackier "had been received and cataloged in at least one library in 1994." *Id.* (citing Ex. 1010). Petitioner concludes Sackier is prior art to the '200 patent under 35 U.S.C. § 102(b), because its publication in 1994 precedes the '200 patent's earliest-possible effective filing date in 1998 by more than one year. Pet. 11 n.3, 44.

Patent Owner argues "[t]he sole evidence in support of Sackier's public accessibility is" the Declaration of Mary Piorun (Exhibit 1010), which is insufficient to establish the alleged publication of Sackier in 1994. Prelim. Resp. 4, 28–30. Patent Owner particularly asserts Ms. Piorun "does not provide any testimony as to the standard operating procedure for the library in 1994," and "does not claim to be familiar with the library's standard operating procedure in 1994." *Id.* at 29. According to Patent Owner, "Ms. Piorun could not have testified" as to these issues, "because she was not employed by the library until" 2017. *Id.* (citing Ex. 1010 ¶ 1).

At institution, a petitioner must identify with particularity sufficient evidence and argument to establish a reasonable likelihood that an asserted reference was publicly accessible before the critical date of the challenged

patent and thus qualifies as a printed publication. *Hulu, LLC v. Sound View Innovations, LLC*, IPR2018-01039, Paper 29 at 12–14 (PTAB Dec. 20, 2019) (precedential).⁷ There is no presumption in favor of institution or in favor of finding that a reference is a printed publication. *Id.* at 16–17.

We, first, disagree with Patent Owner’s assertion that the Piorun Declaration is the “sole” evidence of public accessibility, because Patent Owner overlooks Sackier itself. *See, e.g., Telefonaktiebolaget LM Ericsson v. TCL Corp.*, 941 F.3d 1341, 1344 & 1347 (Fed. Cir. 2019) (holding that “the date on the face of the journal” was part of the substantial evidence supporting PTAB’s finding that a journal article was prior art); *Hulu*, at 17–20 (“[T]he indicia on the face of a reference, such as printed dates and stamps, are considered as part of the totality of the evidence.”). Sackier bears several hallmarks suggesting it was published in 1994 as part of a regularly distributed medical journal. These hallmarks include the name of the journal (“Surgical Endoscopy”); citation information reflecting the date, the volume number, and the pertinent page numbers of the journal (“Surg Endosc (1994) 8:63–66”); the dates the article was received and later accepted for publication (“Received: 18 June 1993 / Accepted: 23 July 1993”); the publisher of the journal (“© Springer-Verlag New York Inc.”); and where readers interested in learning more about the topic of Sackier can make inquiries (“Correspondence to: J.M. Sackier” at the “Department of Surgery, University of California, San Diego Medical Center”). Ex. 1009; *see also* Ex. 1010, Ex. A (copy of cover page of the specific issue of Endoscopy Today containing Sackier).

⁷ This Precedential Opinion Panel decision was issued after Patent Owner filed the Preliminary Response in this proceeding.

The Piorun Declaration provides additional evidence tending to show that Sackier was published in 1994 as part of a regularly distributed medical journal. Ms. Piorun testifies that she is the Director of Library Services at the University of Massachusetts Medical School, and has held that position since 2017. Ex. 1010 ¶ 1. She states she is “familiar with how publications are entered into the library’s catalog, processed with date stamps, and become available to the public,” “[h]istorically and routinely.” *Id.* ¶¶ 1–2. Patent Owner’s argument that this testimony lacks credibility because Ms. Piorun was not employed at the library until 2017 is, on the present record, not persuasive. As Director of Library Services at the library, Ms. Piorun would seem to be a competent witness to testify as to the library’s historical practices in cataloging medical journals. At this stage of the proceeding, we therefore credit her testimony, based on the business records of the library, that the issue of Surgical Endoscopy containing Sackier was acquired by the library on or before February 3, 1994. *Id.* ¶¶ 2–3 & Ex. A. Her testimony tends to show that Sackier was published no later than 1994.

The prior Board decisions cited by Patent Owner are distinguishable from the facts presented here. In *Symantec Corp. v. Trustees of Columbia University*, IPR2015-00370, Paper 13 at 6–9 (PTAB June 17, 2015), the “Cardinale” reference at issue was a Master’s Thesis, which did not bear any indicia of being part of a regularly distributed medical journal. In *Incyte Corp. v. Concert Pharmaceuticals, Inc.*, IPR2017-01256, Paper 14 at 11, 12–15 (PTAB Apr. 9, 2018), the “Jakafi Label” reference at issue was a drug label that had been approved by the FDA, which did not bear any indicia of being part of a regularly distributed medical journal.

Based on the foregoing evidence presently in the record, Petitioner has demonstrated a reasonable likelihood of prevailing in the assertion that Sackier was published in 1994 as part of a regularly distributed medical journal.

2. *Sackier Disclosure*

Sackier discloses “[a] computer-controlled robot named AESOP (Automated Endoscope System for Optimal Positioning)” for use by a surgeon. Ex. 1009, 64 (col. 1 & Fig. 1), 65 (Fig. 2); *see also id.* at 64 (col. 2) (“The AESOP positioner is controlled by the surgeon by means of either a foot or hand controller.”). In particular:

There are a number of ways in which AESOP may be used by the surgeon to position the scope. Grasping the positioner and depressing the “disable” button causes AESOP to function as a manual scope holder. When the disable button has been pressed, the joints become passive and the surgeon can easily move the positioner to any location. After releasing the disable button the positioner becomes rigid once again. By using the foot or hand controller the surgeon can move the laparoscope in, out, left, right, up or down by applying pressure to the corresponding place on the controller.

Id. at 64 (col. 2). According to Sackier, the AESOP “device is extremely simple to use.” *Id.* at 66 (col. 1).

3. *Claims 14 and 17*

Petitioner provides arguments and evidence, including the Declaration of Dr. William Cimino, in support of contending claims 14 and 17 are unpatentable as having been obvious over Faraz, Lathrop, Tarn, and Sackier. Pet. 74–76; Ex. 1003 ¶¶ 74–77, 92–95, 231–234. Patent Owner provides arguments in opposition. Prelim. Resp. 3–4, 23–28.

Petitioner relies on Sackier for obviousness in two regards, addressing the possibilities that (1) “the combination of Faraz, Lathrop, and Tarn does not expressly disclose a robotic arm with *joints that can be both motorized and manually positionable*”; and (2) “Lathrop’s disclosure of *a single brake release [actuator]* is somehow insufficient.” Pet. 75–76 (emphases added).

a) Sackier Disclosure Versus Claims 14 and 17

Petitioner contends Sackier discloses (1) “a robotic surgical arm could have joints that could be both motorized and manually positionable,” and (2) “use of a single brake release actuator.” Pet. 75–76 (citing Ex. 1009, 64); Ex. 1003 ¶¶ 232–233. In particular, Petitioner asserts Sackier’s system defaults to motorized control of a robot arm by a surgeon using foot and hand controllers, but the surgeon may instead choose to position the arm manually by depressing a single disable button. Pet. 75–76 (citing Ex. 1009, 64); Ex. 1003 ¶¶ 232–233.

Patent Owner contends Sackier is deficient in failing to disclose “any joints are used for ‘moving the end effector so as to manipulate tissues’ like the claimed ‘driven joints’” of claim 1, which Patent Owner asserts Petitioner reads into claim 14. Prelim. Resp. 3, 24. For the reasons provided above, we disagree with Patent Owner’s reading of the Petition in this regard. *See supra* Section III.A.1.b. We therefore do not address this argument further.

Patent Owner also contends Sackier’s disclosure is deficient because “Sackier discloses that *all* joints can [be] driven or all joints can be passive,” rather than “only a particular subset of joints” being driven. Prelim. Resp. 24 (emphasis added). However, Petitioner relies on Faraz, not on

Sackier, as disclosing only a particular subset of joints being driven. *See supra* Section III.E.4.a. Patent Owner’s reading of Sackier does not provide a reason to deny institution, even if the reading is correct.

We determine Petitioner has shown sufficiently that Sackier discloses a robotic surgical arm having joints that can be both motorized and manually positionable, as selected via a single brake release actuator, to demonstrate a reasonable likelihood of prevailing on the challenge to claims 14 and 17 as having been obvious over Faraz, Lathrop, Tarn, and Sackier.

b) Obviousness based on Sackier

Petitioner next contends that, based on Faraz’s instruction to incorporate motorized joints within support structure 10, it would have been obvious from Sackier to modify the combined surgical robot system of Faraz, Lathrop, and Tarn, so that (1) the robotic arms include joints that could be both motorized and manually positionable, with (2) a single brake release actuator to switch between motorized and manual positioning. Pet. 74–76; Ex. 1003 ¶¶ 74–77, 82–85, 92–95, 231–234. In support, Petitioner asserts Faraz and Sackier contain similar features, in that both “contain multi-jointed robotic arms that hold a surgical implement,” both use “brakes to fix the position of joints,” and both are used in laparoscopic surgery. Pet. 74; Ex. 1003 ¶¶ 74–77, 82–83, 92–94. Petitioner also contends a person of ordinary skill in the art “would have understood based on Sackier the benefits of including” a single brake release actuator to switch between motorized and manual positioning, because Sackier teaches such a “‘device is extremely simple to use’ and gives the surgeon as much

control as desired to position the device.” Pet. 75 (quoting Ex. 1009, 66); Ex. 1003 ¶¶ 84–85, 95.

Patent Owner argues Petitioner’s case for obviousness based on Sackier “is nothing more than a conclusory assertion” and is deficient because it would “justif[y] the combination of virtually any two robotic surgery designs, rather than” focusing on the particular references at issue here. Prelim. Resp. 3–4, 24–28. Patent Owner asserts Faraz does not instruct or otherwise motivate any changes to Faraz’s brake system. *Id.* at 26. Patent Owner also asserts “Sackier’s description of its device as ‘extremely simple to use’ was not made in reference to the ‘brake release button,’ and nowhere does Sackier provide any benefits particular to the ‘brake release button’ or explain why one would be desirable to solve a specific problem.” *Id.* at 27 (citing Ex. 1009, 66).

Based on the present record, we conclude Petitioner has provided sufficient argument and evidence in relation to the proposed obviousness based on Sackier to institute review. Sackier discloses that “more advanced holders have pneumatically locking joints” so that “all the joints are simultaneously held rigid or relaxed according to the press of a button.” Ex. 1009, 63 (col. 2) – 64 (col. 1); Ex. 1003 ¶¶ 82–85 (citing this disclosure). Such systems are particularly useful by “surgeons who operate single-handed.” *Id.* at 63 (col. 2). Thus, based on the present record, Sackier appears to indicate the single brake release actuator is part of the reason why the AESOP device is “extremely simple to use.” *Id.* at 66 (col. 1).

c) *Conclusion as to Claims 14 and 17*

Based on the foregoing arguments and evidence presently in the record, Petitioner has demonstrated a reasonable likelihood of prevailing on the challenge to claims 14 and 17 as unpatentable for having been obvious over Faraz, Lathrop, Tarn, and Sackier. We, therefore, institute a review to proceed to a final written decision on that challenge, based on a fully developed record.

IV. CONCLUSION

For the above reasons, we determine the information presented in the record establishes there is a reasonable likelihood that Petitioner would prevail with respect to at least one claim of the '200 patent challenged in the Petition. Accordingly, we institute an *inter partes* review of claims 14 and 17. 35 U.S.C. § 314(a). We do not institute review as to claims 1 and 10–12, because they have been disclaimed by Patent Owner. 37 C.F.R. § 42.107(e) (2019).

At this preliminary stage, the Board has not made a final determination with respect to the patentability of the challenged claims or any underlying factual or legal issue. The Board's final determination will be based on the record as developed during the *inter partes* review.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review is instituted for claims 14 and 17 of the '200 patent on the following grounds:

- (1) unpatentability under 35 U.S.C. § 103 over Faraz,
Lathrop, and Tarn; and
- (2) unpatentability under 35 U.S.C. § 103 over Faraz,
Lathrop, Tarn, and Sackier;

FURTHER ORDERED that review is not instituted as to claims 1 and 10–12, which have been disclaimed; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial, which commences on the entry date of this decision.

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