

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INTUITIVE SURGICAL, INC.,
Petitioner,

v.

ETHICON LLC,
Patent Owner.

IPR2018-01703
Patent 8,616,431 B2

Before JOSIAH C. COCKS, BENJAMIN D. M. WOOD, and
MATTHEW S. MEYERS, *Administrative Patent Judges*.

WOOD, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. Background

Intuitive Surgical, Inc. (“Petitioner”) filed a Petition (Paper 2, “Pet.”) requesting *inter partes* review of claims 1–7, 10–14, 16–20, and 23–26 of U.S. Patent No. 8,616,431 B2 (Ex. 1001, “the ’431 patent”) on the following grounds (Pet 9):

No.	Reference[s]/Basis	35 U.S.C. §	Claim[s] Challenged
1	Tierney ¹ , Whitman ²	§ 103 ³	1–6, 10–13
2	Tierney, Whitman, Zemlok ⁴	§ 103	7, 14, 16–20, 23–26
3	Whitman	§ 102	1, 2, 6, 10–13
4	Tierney, Whitman, Timm Application ⁵	§ 103	11

Ethicon LLC (“Patent Owner”) filed a Preliminary Response. Paper 6.

¹ U.S. Pat. No. 7,524,320 B2 (issued Apr. 28, 2009) (Ex. 1005).

² U.S. Pat. Appl. Pub. No. 2009/0101692 A1 (published Apr. 23, 2009) (Ex. 1004).

³ The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. § 103. Because the application from which the ’431 patent issued was filed before March 16, 2013, the effective date of the relevant amendment, the pre-AIA version of § 103 applies.

⁴ U.S. Pat. Appl. Pub. No. 2008/0251568 A1 (published Oct. 16, 2008) (Ex. 1006).

⁵ U.S. Pat. Appl. Pub. No. 2008/0308601 A1 (published Dec. 18, 2008) (Ex. 1016).

On February 19, 2019, we instituted *inter partes* review. Paper 7 (“Dec.”). Patent Owner subsequently filed a Patent Owner Response (Paper 12) (“PO Resp.”), Petitioner filed a Reply to the Patent Owner Response (Paper 14, “Pet. Reply”), and Patent Owner filed a Sur-reply (Paper 16, “PO Sur-reply”). A hearing was held on October 17, 2019, and a transcript of the hearing is included in the record. Paper 21.

We have jurisdiction under 35 U.S.C. § 6. Petitioner bears the burden of proving unpatentability of the challenged claims, and the burden of persuasion never shifts to Patent Owner. To prevail, Petitioner must prove unpatentability by a preponderance of the evidence. *See* 35 U.S.C. § 316(e) (2012); 37 C.F.R. § 42.1(d) (2018). This decision is a Final Written Decision under 35 U.S.C. § 318(a). For the reasons discussed below, we hold that Petitioner has demonstrated by a preponderance of the evidence that claims 1, 2, 6, and 10–13 of the ’431 patent are unpatentable under 35 U.S.C. § 102, but has not demonstrated that claims 1–7, 10–14, 16–20, and 23–26 are unpatentable under 35 U.S.C. § 103.

B. Related Proceedings

Petitioner states that the ’431 patent is the subject of Civil Action No. 1:17-cv-00871-LPS in the U.S. District Court for the District of Delaware. Pet. 8. Patent Owner states that U.S. Patent Nos. 9,585,658 B2, 8,479,969 B2, 9,113,874 B2, 9,084,601 B2, 8,991,677, and 8,998,058 B2 are also asserted in the Delaware litigation. Paper 4, 2. Petitioner is challenging these related patents in other proceedings before the Board.

C. The ’431 Patent

The ’431 patent issued December 31, 2013 from an application filed February 9, 2012. Ex. 1001, codes (45), (22). The application from which

the '431 patent issued is a continuation of an application filed May 27, 2011, which is a continuation-in-part of an application that claims priority to June 4, 2007. *Id.* at code (63).

The '431 patent is titled “Shiftable Drive Interface for Robotically-Controlled Surgical Tool,” and discloses, *inter alia*, a surgical instrument that is actuated by a rotary motion provided by a robotic system. *Id.* at 3:27–40. Figure 100 depicts a surgical tool embodiment of this invention, and is reproduced below:

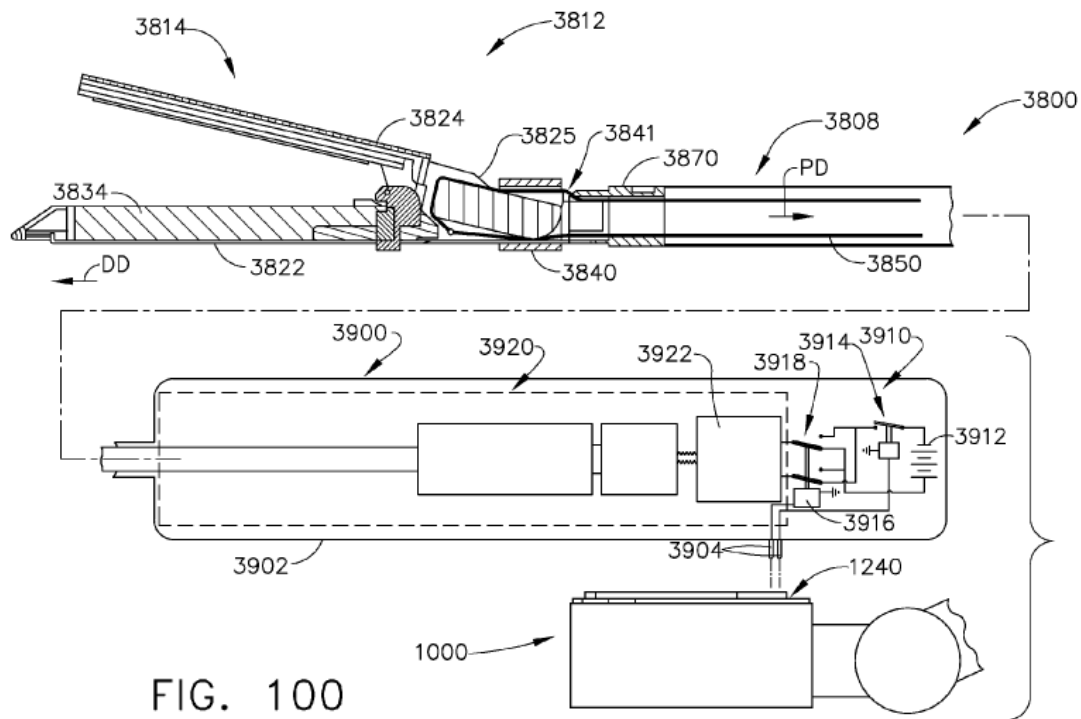
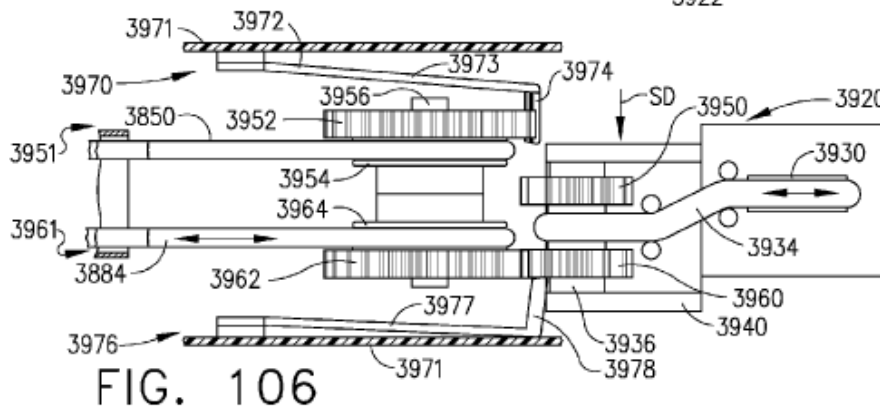
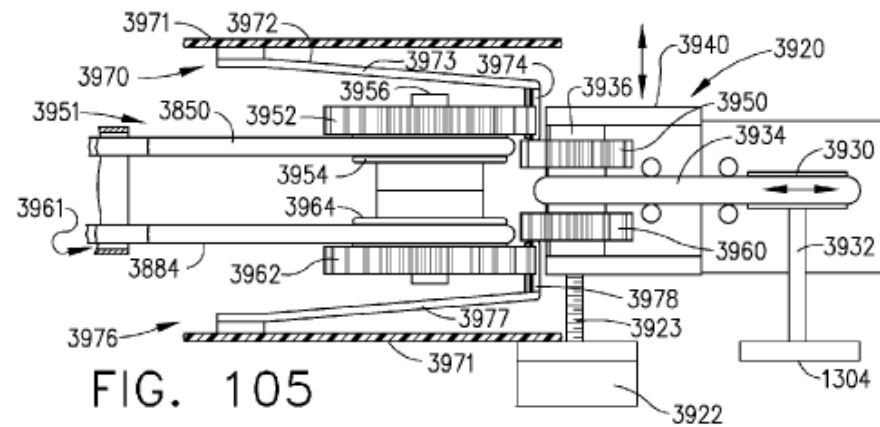
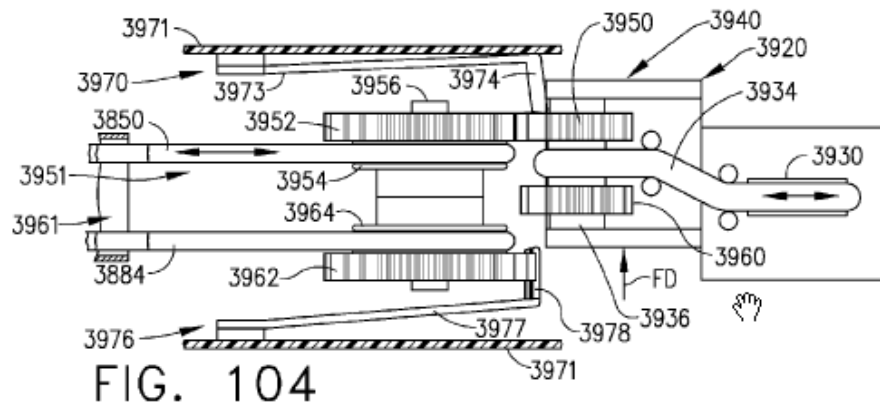


Figure 100 depicts surgical instrument 3800 comprising endocutter 3814 coupled to elongated shaft assembly 3808, which is attached to tool mounting portion 3900. *Id.* at 61:4–8, 30–32. Cable drive transmission 3920 is operably supported on tool mounting plate 3902 of the tool mounting portion. *Id.* at 63:17–20. Tool mounting portion 3900 has an array of electrical connecting pins 3904 that interface with slots 1258 in

adapter 1240 of robotic system 1000, allowing the robotic system to send control signals to the surgical instrument. *Id.* at 63:20–24, Fig. 42.

Cable drive transmission 3920 is shown in greater detail in Figures 104–106, reproduced below:



As shown in Figures 104–106, cable drive transmission 3920 comprises drive pulley 3930 attached via a drive shaft to driven element

1304, which interfaces with drive element 1250 of adaptor 1240, depicted in Figure 100, shown above. *Id.* at 63:43–48, Figs. 42, 105. This arrangement allows robotic system 1000 to apply rotary motion to drive pulley 3930, and thus surgical instrument 3800, in a desired direction. *Id.* at 63:49–51. Drive pulley 3930 is also connected to shifter yoke 3940 via belt 3934. *Id.* at 63:51–53. Shifter yoke 3940 is shiftable between a first direction and a second direction by shifter motor 3922. *Id.* at 63:53–59, Fig. 100. When the shifter yoke is shifted in the first direction, closure drive gear 3950 engages with closure drive assembly 3951, allowing closure cable 3850 to be driven to close the end effector and clamp tissue. *Id.* at 64:44–59. When the shifter yoke is in the second position, firing drive gear 3960 engages with firing drive assembly 3961 to fire the staples and cut the tissue clamped in the end effector. *Id.* at 64:63–65:14.

D. The Challenged Claims

Petitioner challenges claims 1–7, 10–14, 16–20, and 23–26 of the '431 patent. Pet. 1. Claims 1, 14, and 20 are independent. Claim 1 is reproduced below:⁶

1. [1.1] A tool mounting device for coupling a surgical end effector configured to selectively perform at least two actions in response to control motions applied thereto to a tool drive assembly of a robotic system that is operatively coupled to a control unit of the robotic system, said tool mounting device comprising:

[1.2] a tool mounting portion configured for operable attachment to the tool drive assembly of the robotic system;

[1.3] an elongated shaft assembly having a proximal end portion operably supported on said tool mounting portion and a

⁶ We reproduce the corrected version of claim 1 (*see* Ex. 1002, 4) and include Petitioner's limitation labels (*see* Pet. 13–36).

distal end portion operably interfacing with said surgical end effector to apply said control motions thereto; and

[1.4] a transmission arrangement operably supported on said tool mounting portion

[1.5] such that when said tool mounting portion is attached to the tool drive assembly, said transmission arrangement is configured to operably interface with a rotatable drive element of the tool drive assembly to receive a rotary output motion therefrom,

[1.6] said transmission arrangement communicating with the control unit of the robotic system and being responsive to actuation motions therefrom to move between first and second positions

[1.7] such that when said transmission arrangement is in said first position, an application of said rotary output motion thereto by said rotatable drive element of the tool drive assembly causes a first one of said control motions to be applied to a portion of said surgical end effector through said elongated shaft assembly and when said transmission arrangement is in said second position, said application of said rotary output motion thereto by said rotatable drive element of the tool drive assembly causes a second one of said control motions to be applied to another portion of said surgical end effector through said elongated shaft assembly.

E. Testimonial Evidence

In support of its asserted grounds of unpatentability, Petitioner relies on a declaration by Dr. Bryan Knodel (Ex. 1003), filed with the Petition. Patent Owner deposed Dr. Knodel and entered the transcript of the deposition into the record (Ex. 2013). In support of its Response to the Petition, Patent Owner relies on a declaration by Dr. William Cimino (Ex. 2012). Petitioner deposed Dr. Cimino and entered the transcript of the deposition into the record (Ex. 1018).

II. ANALYSIS

A. *Level of Ordinary Skill in the Art*

Petitioner's Declarant, Dr. Knodel, asserts that a person of ordinary skill in the art "would have had the equivalent of a Bachelor's degree or higher in mechanical engineering with at least 3 years working experience in the design of comparable surgical devices." Ex. 1003 ¶ 25. Dr. Knodel also asserts that "[a]dditional education in a relevant field, such as mechanical engineering or robotics (to the extent pertinent), or industry experience may compensate for a deficit in one of the other aspects of the[se] requirements." *Id.* Patent Owner's Declarant, Dr. Cimino, "generally agree[s]" with Dr. Knodel's assessment, but adds that one of ordinary skill in the art "would also have experience in the design and analysis of robotics and robotic systems as they pertain to surgical instruments." Ex. 2012 ¶ 5. Petitioner does not dispute this contention.

In light of the testimony of Drs. Knodel and Cimino, we determine that one of ordinary skill in the art would have had the equivalent of a Bachelor's degree or higher in mechanical engineering with at least three years working experience in the design of surgical instruments, and would also have had experience in the design and analysis of robotics and robotic systems as they pertain to surgical instruments. We also presume that the cited prior art references reflect the level of ordinary skill at the time of the invention. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001).

B. *Claim Construction*

Because the Petition in this proceeding was filed before November 13, 2018, we determine whether to institute *inter partes* review of the claims based on the "broadest reasonable construction" of the claims in light of the

specification in which the claims appear. 37 C.F.R. § 42.100(b);⁷ *see also* *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2142 (2016) (upholding the use of the broadest reasonable interpretation standard). Under this standard, claim terms are generally given their ordinary and accustomed meaning as understood by one of ordinary skill in the art, unless it appears from the specification, the file history, or other evidence asserted by the parties that the inventor used them differently. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). Any special definition for a claim term must be set forth in the specification with reasonable clarity, deliberateness, and precision. *Id.*

1. *robotic system*

The parties dispute the construction of “robotic system.” Patent Owner contends that “a ‘robotic system’ refers to ‘a system comprising a master controller and a robotic arm slave cart’ (i.e., a telesurgical system).” PO Resp. 16 (citing Ex. 2012 ¶¶ 37–40). Petitioner, on the other hand, contends that a robotic system is “a self-powered, steerable, computer-controlled device that can be programmed to aid in the positioning and manipulation of surgical instruments, and act as a remote extension of a human surgeon.” Pet. 72 (citing Ex. 1003 ¶¶ 162–64).

We begin our analysis with the words of the claims. Independent claims 1 and 20 recite a “tool mounting device for coupling a surgical end effector . . . to a tool drive assembly *of a robotic system* that is operatively

⁷ See Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (to be codified at 37 C.F.R. pt. 42) (changing claim construction standard for petitions filed on or after November 13, 2018).

coupled to a control unit of the *robotic system*.” Ex. 1001, 91:2–6, 94:23–27 (emphasis added). Independent claim 14 is similar, but recites “tool holder” rather than “tool drive assembly.” *Id.* at 93:4–7. From this we determine that the claimed robotic system comprises, at a minimum, a “tool drive assembly” (or “tool holder”) and a “control unit.”

We turn next to the Specification of the ’431 patent. Patent Owner contends that the Specification expressly defines “robotic system” as a system comprising a master controller and a robotic arm slave cart (PO Resp. 16), and relies on the following excerpt from the Specification to support this contention:

FIG. 34 depicts one version of a master controller 1001 that may be used in connection with a robotic arm slave cart 1100 of the type depicted in FIG. 35. **Master controller 1001 and robotic arm slave cart 1100, as well as their respective components and control systems are collectively referred to herein as a robotic system 1000.** Examples of such systems and devices are disclosed in U.S. Pat. No. 7,524,320 which has been herein incorporated by reference.

PO Resp. 16 (citing Ex. 1001, 26:35–42 (emphasis added by Patent Owner)).⁸

We disagree that this excerpt constitutes an express construction of “robotic system.” Instead, it refers to a particular embodiment of a robotic system, “robotic system 1000.” As our reviewing court has stated, “although the specification often describes very specific embodiments of the invention, we have repeatedly warned against confining the claims to those

⁸ In the absence of further elaboration from Patent Owner, we assume that Patent Owner defines “robotic arm slave cart” as robotic arm slave cart 1100 depicted in Figure 35 of the Specification.

embodiments.” *Acumed LLC v. Stryker Corp.*, 483 F.3d 800, 805 (Fed. Cir. 2007) (quoting *Phillips v. AWH Corp.*, 415 F.3d 1303, 1323 (Fed. Cir. 2005)); *see also* *Bradium Techs. LLC v. Iancu*, 923 F.3d 1032, 1044 (Fed. Cir. 2019) (“it is not enough for a patentee to simply disclose a single embodiment or use a word in the same manner in all embodiments, the patentee must clearly express an intent to redefine the term.”) (internal quotation marks omitted). Moreover, the Specification states that the full scope of the invention should not be considered limited to the specific embodiments disclosed. For example, the Specification states that “[t]hose of ordinary skill in the art will understand that the devices and methods specifically described herein and illustrated in the accompanying drawings are non-limiting exemplary embodiments and the scope of the various embodiments of the present invention is defined solely by the claims.” Ex. 1001, 11:12–16; *see also id.* at 11:36–40 (same). Indeed, the Specification teaches that other robotic systems may be used in connection with the invention. The Specification teaches, for example, that a surgical tool embodiment of the invention “may well be suited for use with those robotic systems manufactured by Intuitive Surgical, Inc.,” i.e., robotic surgical systems comprising a master controller and a robotic arm slave cart (Ex. 1005, 7:1–3), but “a variety of different forms of the tool systems disclosed and claimed herein [may be] effectively employed in connection with other types and forms of robotic systems that supply programmed rotary or other output motions.” Ex. 1001, 34:58–35:5; *see id.* at 27:49–52 (“Those of ordinary skill in the art will appreciate that various embodiments of the present invention may incorporate a wide variety of alternative robotic structures.”).

Patent Owner also relies on the following excerpt to support its contention that the Specification defines “robotic surgical system” as a system comprising a master controller and a robotic arm slave cart:

As can be seen in FIG. 35, in one form, the robotic arm cart 1100 is configured to actuate a plurality of surgical tools, generally designated as 1200. **Various robotic surgery systems and methods employing master controller and robotic arm cart arrangements** are disclosed in U.S. Pat. No. 6,132,368, entitled “Multi-Component Telepresence System and Method”, the full disclosure of which is incorporated herein by reference.

PO Resp. 16 (quoting Ex. 1001, 26:55–62 (emphasis added by Patent Owner)). We do not read this passage as defining “robotic system,” however. Instead, we read the sentence “[v]arious robotic surgery systems and methods employing master controller and robotic arm cart arrangements are disclosed in U.S. Pat. No. 6,132,368” to mean that U.S. Pat. No. 6,132,368 describes the subset of robotic surgery systems that employ “master controller and robotic arm cart arrangements.” This sentence therefore suggests that there may be robotic surgical systems that do not include both of these components.

Next, Patent Owner asserts that the Specification “uses the term ‘robotic system’ synonymously with a ‘telesurgical system.’” PO Resp. 17 (citing Ex. 1001, 26:11–14). The Specification does not, however, define “telesurgical system,” so Patent Owner relies on the testimony of its declarant, Dr. Cimino, to define this term. According to Dr. Cimino, a “telesurgical system” is “a system comprising a master controller and a robotic arm slave cart.” *Id.* (citing Ex. 2012 ¶¶ 39–40, 67). Dr. Cimino, relies on an excerpt from Exhibit 1017 (U.S. Patent No. 6,817,974 B2) for this definition:

In a telesurgery system, the surgeon is often provided with an image of the surgical site at a computer workstation . . . [T]he surgeon performs the surgical procedure on the patient by manipulating master input or control devices of the workstation. **The master controls the motion of a servomechanically operated surgical instrument.”**

Ex. 2012 ¶ 39 (quoting Ex. 1017, 2:33–50 (emphasis added by Dr. Cimino)).

We do not find Dr. Cimino’s testimony in this regard persuasive. First, the excerpt’s use of the term “often” suggests that the subsequent remarks do not necessarily apply to all telesurgery systems. More importantly, the excerpt does not state that a “robotic arm slave cart” is part of all telesurgery systems. Neither Dr. Cimino nor Patent Owner explains how “servomechanically operated surgical instrument” would mean “robotic arm slave cart” to one of ordinary skill in the art. We are reluctant to give weight to Dr. Cimino’s testimony in the absence of such explanation.

Finally, Patent Owner asserts that its definition of “robotic system” is “consistent with how a POSITA would have understood the term . . . in the context of surgical instruments at the time of the priority date of the 431 Patent.” PO Resp. 17 (citing Ex. 2012 ¶ 40). In support of this assertion, Patent Owner again relies on Dr. Cimino’s testimony, who in turn relies on excerpts from several prior art references. We have reviewed these excerpts and find that they lend little support to Patent Owner’s construction. For example, Dr. Cimino states that Exhibit 1010—an article by Bishoy Morris titled “Robotic Surgery: Applications, Limitations, and Impact on Surgical Education” (hereinafter, the “Morris article”)—“describes that robotic systems comprise two basic components—‘The surgeon’s master console’ and a ‘patient-side slave robotic manipulator.’” Ex. 2012 ¶ 40 (citing Ex. 1010, 1–2). But this particular excerpt of the Morris article does not

describe robotic systems in general, but rather describes two specific systems that received approval by the US Food and Drug Administration and were in use as of the date of the reference. Ex. 1010, 1.

The Morris article does provide a more general description of robotic surgical systems, on which Petitioner relies. The Morris article states:

A surgical robot is a self-powered, computer-controlled device that can be programmed to aid in the positioning and manipulation of surgical instruments, enabling the surgeon to carry out more complex tasks. Systems currently in use are not intended to act independently from human surgeons or to replace them.

Ex. 1010, 1. We consider this excerpt to be helpful in determining how one of ordinary skill in the art would construe “robotic systems.” Notably, both Petitioner and Patent Owner cite to this reference as helpful in ascertaining how one of ordinary skill in the art would have understood the term, although they rely on different parts. Further, this excerpt encompasses the surgical robot embodiments disclosed in the ’431 patent. See Ex. 1001, 26:35–64, 27:40–43, 55–67. Therefore, we disagree with Patent Owner’s assertion (PO Resp. 19) that this definition is inconsistent with the Specification. And although, as Patent Owner points out, this definition is based on extrinsic evidence, it is generally permissible to consult extrinsic sources for assistance in defining a term that is not expressly defined in intrinsic evidence. *Cf. Comaper Corp. v. Antec, Inc.*, 596 F.3d 1343, 1348 (Fed. Cir. 2010) (If “the specification does not assign or suggest a particular definition [of a claim term], in determining the ordinary and customary meaning of the claim term as viewed by a person of ordinary skill in the art, it is appropriate to consult a general dictionary definition of the word for guidance.”). Although the Morris article is not a general purpose dictionary,

the statement in the article directly addresses the meaning of the term in question, and we deem it reliable for that purpose.

Accordingly, we define “robotic system” as a system that comprises, *inter alia*, a tool drive assembly and a control unit, and that it is a self-powered, computer-controlled device that can be programmed to aid in the positioning and manipulation of surgical instruments, enabling the surgeon to carry out more complex tasks.

2. “*tool mounting portion*”

Patent Owner construes “tool mounting portion” to mean “the portion of the tool mounting device that mounts to the robotic system.” PO Resp. 21 (citing Ex. 2012 ¶¶ 41–42, Ex. 2013, 16:1–13). Patent Owner further contends that “the term ‘mounting’ means to attach to a support.” *Id.* (citing Ex. 2012 ¶¶ 41–42). Petitioner does not appear to dispute this construction. *See* Pet. Reply 29 (contending that “Whitman’s instrument has a tool mounting portion that mounts the instrument to the flexible shaft of the robotic system”).

Neither party identifies anything in the independent claims or dependent claims that imposes any structural requirement on the claimed “tool mounting portion.”⁹ Further, although the claims appear to impose a functional requirement on the “tool mounting portion,” that function is not “mounting” per se (we accept Patent Owner’s undisputed interpretation of “mounting” to mean to attach to a support). For example, claim 1 recites “a

⁹ This term does not employ the term “means,” and thus is presumed not to be a means-plus-function claim term subject to 35 U.S.C. § 112(f). *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1346 (Fed. Cir. 2015) (en banc). Neither party sought to overcome this presumption.

tool mounting portion configured for *operable attachment* to the tool drive assembly of the robotic system.” Ex. 1001, 91:8–9 (emphasis added). Further, claim 1 requires the tool mounting portion to “operably support[]” an elongated shaft assembly and a transmission arrangement. *Id.* at 91:10–11, 14–15. If the patentee had intended claim 1 to require the tool drive assembly to support the tool mounting portion, one would have expected the patentee to use similar language. Moreover, claim 1 is an apparatus claim, not a method claim; it does not require the step of “mounting” the tool mounting portion to the tool drive assembly.

Accordingly, based on the evidence of record and the parties’ arguments, we interpret “tool mounting portion” as structure for operable attachment to the tool drive assembly of a robotic system, and that operably supports an elongated shaft assembly and a transmission arrangement. We give all other claim terms their plain and ordinary meaning and determine it is unnecessary to make explicit that meaning for any of those terms. *See Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (holding that terms need to be construed “only to the extent necessary to resolve the controversy”).

C. Ground 1: Claims 1–6 and 10–13—Obviousness—Tierney and Whitman

Petitioner alleges that claims 1–6 and 10–13 would have been obvious over Tierney and Whitman. Pet. 13–57.

1. Tierney (Ex. 1005)

Tierney discloses a robotic surgical system in which a plurality of different tool types can be coupled to a robotic manipulator. Ex. 1005, 4:31–44. Figure 4 depicts an exemplary tool, and is reproduced below:

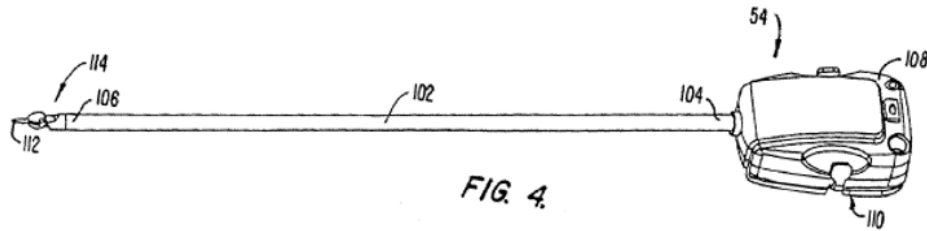
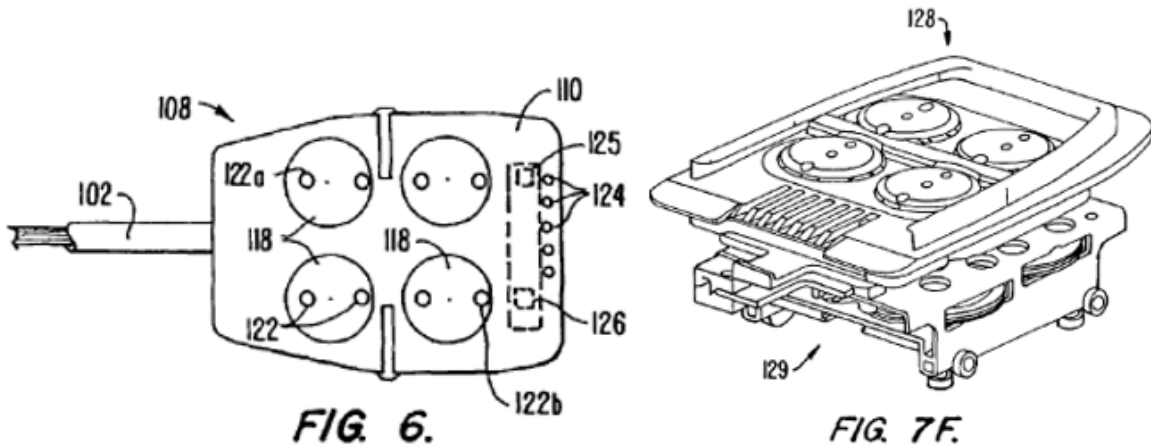


Figure 4 depicts tool 54 comprising rigid shaft 102 with surgical end effector 114 at the distal end and housing 108 at the proximal end. *Id.* at 9:11–13. Housing 108 includes interface 110 that mechanically and electrically couples tool 54 to a robotic manipulator. *Id.* at 9:13–15. Figures 6 and 7F of Tierney are reproduced below:



Figures 6 and 7F respectively depict interface 110 and adapter 128 mounted to manipulator holder 129. *Id.* at 5:62–63, 66–67. Interface 110 comprises driven elements 118, which mechanically couple end effector 114 to drive motors in the manipulator via adapter 128 and tool holder 129. *Id.* at 10:12–15.

2. *Whitman (Ex. 1004)*

Whitman relates to a powered, rotating, and articulating surgical device for clamping, cutting, and stapling tissue. Ex. 1004 ¶ 3. Figure 2B of Whitman depicts an exemplary device, and is reproduced below:

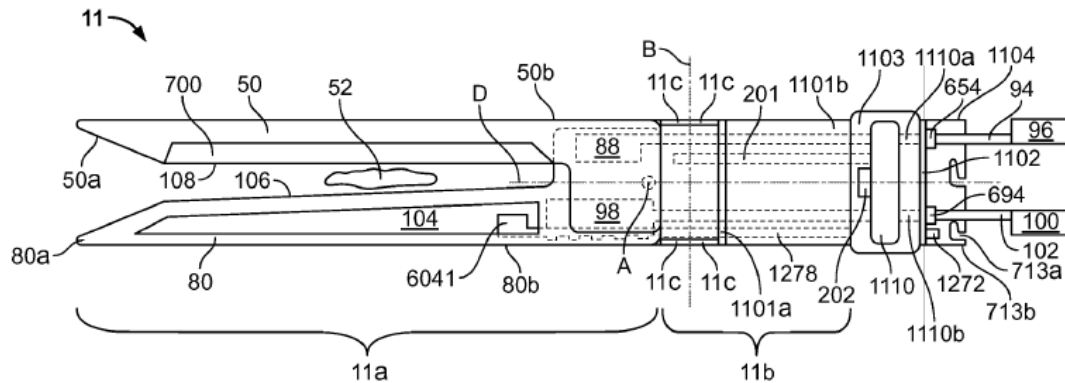
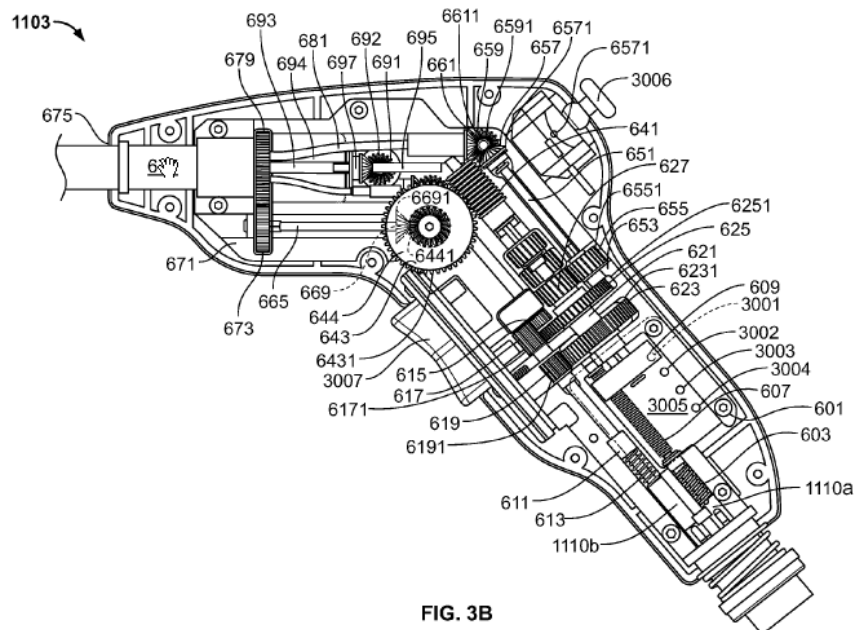


FIG. 2B

Figure 2B schematically depicts surgical device 11 comprising jaw portion 11a pivotably coupled to shaft portion 11b by hinge portion 11c. *Id.* ¶ 70. Shaft portion 11b, in turn, is coupled to handle 1103. *Id.* ¶ 72. Surgical device 11 may perform a number of different movements: jaws 50, 80 of jaw portion 11a are pivotable relative to each other about pivot axis A to clamp tissue; jaw portion 11a may be articulated relative to shaft portion 11b about hinge portion 11c and pivot axis B; and jaw and shaft portions 11a, b, are rotatable relative to handle 1103 about longitudinal axis D. *Id.* ¶¶ 70–72, 74. Surgical device 11 is also capable of driving a staple-pushing element and cutting blade through tissue clamped by the jaw portion. *Id.* ¶ 82. Each of these movements and functions is performed using a separate driver: clamping driver 88, articulation driver 201, rotation driver 202, and firing driver 98, respectively. *Id.* ¶¶ 75, 79–82. Function selection module 1110 is actuated by first rotatable drive shaft 1110a to move between four different functional positions; in each of these positions, function selector

module 1110 causes engagement of second rotatable drive shaft 1110b to select one of drivers 88, 98, 201, 202, which performs the function associated with that driver. *Id.* ¶ 76. First rotatable drive shaft 1110a is driven by first motor 96 via third rotatable drive shaft 94, and second rotatable drive shaft 1110b is driven by second motor 100 via fourth rotatable drive shaft 102. *Id.* ¶ 78.

Figure 3B of Whitman depicts handle 1103 and function selector module 1110 in greater detail, and is reproduced below.



As shown in Figure 3B, rotation of first rotatable drive shaft 1110a causes rotation of selector shaft 601, which in turn causes function selector block 609 to move proximally or distally, depending on the rotation direction, to one of four functional positions. *Id.* ¶¶ 92–93, 114, 141. Each functional position engages one of the functional drivers with second rotatable drive shaft 1110b, via function shaft 611, to allow second rotatable drive shaft 1110b to drive the selected driver to perform the selected function. *Id.* ¶¶ 140, 149, 157, 164–66, 174, 197, 203.

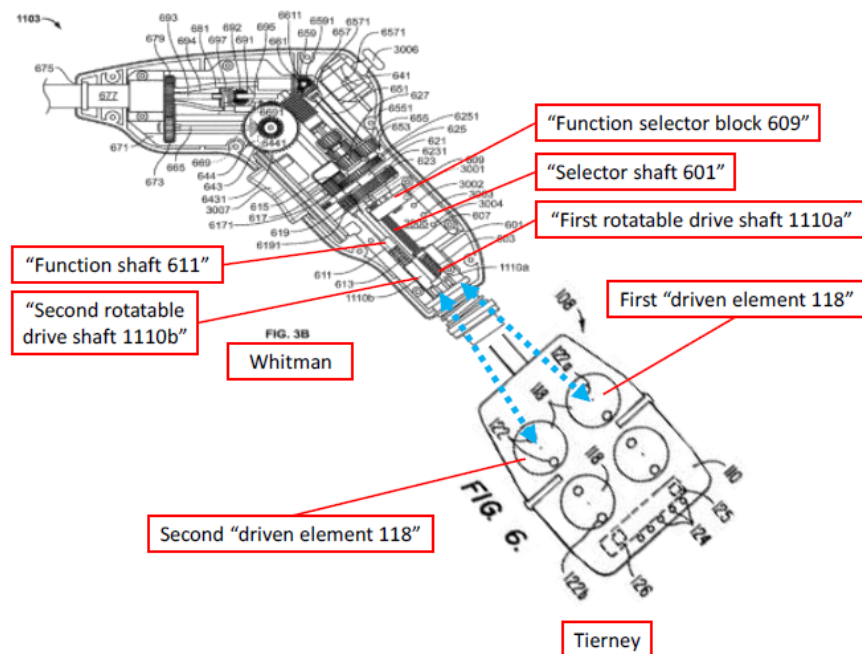
3. *Principles of Law*

“A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in [35 U.S.C. § 102], if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains.” 35 U.S.C. § 103. Obviousness is a question of law based on underlying findings of fact. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). The underlying factual considerations “include the scope and content of the prior art, the differences between the prior art and the claimed invention, the level of ordinary skill in the art, and any relevant secondary considerations” of non-obviousness, including commercial success of the patented product or method, a long-felt but unmet need for the functionality of the patented invention, and the failure of others who have unsuccessfully attempted to accomplish what the patentee has achieved. *Id.* at 17–18. The obviousness analysis should not be conducted “in a narrow, rigid manner,” but should instead focus on whether a claimed invention is merely “the result[] of ordinary innovation,” which is not entitled to patent protection. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007).

4. *Whether Whitman and Tierney teach or suggest all of the limitations of claim 1*

For this Ground, Petitioner contends that claims 1–6 and 10–13 would have been obvious over Tierney and Whitman. Pet. 13–57. Of these claims, claim 1 is the sole independent claim. With respect to claim 1, Petitioner proposes combining: (1) Whitman’s surgical end effector, elongated shaft,

and transmission arrangement; with (2) Tierney's proximal housing 108 (with driven elements 118), adapter 128 and tool holder 129 (with drive elements 119), motors 70 of manipulator 58, and master controller 150 of robotic surgical system 10. Pet. 13–36. That is, according to Petitioner, "Whitman's surgical device 11 [is used] with Tierney's robotic system such that Whitman's transmission is responsive to actuation motions from the controller of Tierney's robotic system to move between at least first and second positions." *Id.* at 26 (citing Ex. 1003 ¶ 57). To illustrate the combination, Petitioner provides an annotated figure that combines Whitman Figure 3B and Tierney Figure 6. Pet. 27. This figure is reproduced below:



As shown in this Figure, rotary motion from Tierney's driven elements 118 would drive shafts 1110a,b, with Whitman's device otherwise operating as described in Whitman. As Petitioner explains:

A first one of Tierney's driven elements 118 would drive Whitman's first rotatable drive shaft 1110a (now in Tierney's proximal housing 108), which drives selector shaft 601 to shift the position of function selector block 609, which selects the

desired end effector function to be driven (rotation, articulation, clamping, or firing). A second one of Tierney's driven elements 118 would drive Whitman's "second rotatable drive shaft 1110b" (also, now located in Tierney's proximal housing 108) to rotate "function shaft 611," which provides the mechanical power to drive the selected end effector function (i.e., rotation, articulation, clamping, or firing).

Id. at 26–27 (citing Ex. 1003 ¶ 57). Patent Owner does not dispute that Petitioner's proposed combination of Tierney and Whitman teaches all of the limitations of claim 1. *See, e.g.*, PO Resp. 29.

Having carefully reviewed the record and the parties' respective positions, we find that the combination of Whitman and Tierney teaches or suggests all of the limitations of claim 1.

5. *Whether Petitioner has Adequately Shown a Reason to Combine Whitman and Tierney*

"Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR Intern. Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)). Petitioner articulates several reasons why one of ordinary skill in the art would have combined Whitman and Tierney. Pet. 28–31. Patent Owner disagrees that one of ordinary skill in the art would have reason to combine Whitman and Tierney, but asserts that even if a general motivation to combine the references existed, the skilled artisan would not have included Whitman's "optional" shifter mechanism. PO Resp. 29–42. We first address Patent Owner's contention that Whitman's shifter mechanism is optional, and then discuss Petitioner's reasons to combine the references.

- a. Whether one of ordinary skill in the art would have considered Whitman's Shifter Mechanism to be Optional

Patent Owner contends that one of ordinary skill in the art would have understood from Whitman that its shifter mechanism could be omitted and replaced with additional drive shafts. Patent Owner relies primarily on this excerpt from Whitman to support this contention:

[I]t is possible to provide any suitable number of drive sockets and drive shafts. For example, a single drive shaft, or more than two drive shafts, may be provided to perform the above-described functions of the surgical device 11.

PO Resp. 41 (quoting Ex. 1004 ¶ 83); *see also* Ex. 2012 ¶ 80 (“Whitman . . . teaches that the instrument can include sufficient drive shafts to drive each end effector function without a shifter mechanism.”).

Petitioner's Declarant, Dr. Knodel, apparently agrees with this reading of Whitman. At his deposition, Dr. Knodel testified that “you can have a drive shaft for every function coupled to a motor in the controller for every function or not. [Whitman] covers both.” Ex. 2013, 22:5–7. Dr. Knodel agreed that, in this configuration, a shifter would not be included in the device. *Id.* at 22:8–12. According to Dr. Knodel:

It can have a shifter or not, and it leaves open – in my reading of Whitman, it leaves open to – shifter could be used a little, or the shifter could be used a lot . . . including one input drive and all shifter – not even two. It was very broad.

Id. at 22:14–20.

In its Reply, Petitioner responds that “Whitman's disclosure is predominantly about the shifter and its function selector module,” and that the passage of Whitman on which Patent Owner relies “does not say that the

function selector block would be ripped out of the Whitman device altogether.” Pet. Reply 4–6. But in contending that this passage should not be read to suggest an embodiment without the shifter, Petitioner does not explain how this passage should otherwise be interpreted. More importantly, Petitioner does not address Dr. Knodel’s deposition testimony, much less dispute Patent Owner’s characterization of this testimony as an admission that Whitman’s device need not have a shifter. In sum, the weight of the evidence—Ex. 1004 ¶ 83, Ex. 2012 ¶ 47, Ex. 2013, 21:23–22:17—supports Patent Owner’s position that Whitman suggests an embodiment of its surgical instrument that does not include a shifter mechanism; i.e., the shifter mechanism is “optional.”

b. Performing More Functions with Fewer Driven Elements

First, Petitioner argues that one of ordinary skill in the art would have combined Whitman and Tierney “to increase the number of functions that can be performed on the end effector.” Pet. 28 (citing Ex. 1003 ¶ 59). Petitioner asserts that “two drive elements could provide the four functions of Tierney, or four drive elements could provide at least 6 to 8 functions (depending on whether the combination would have one or two Whitman shifters).” *Id.* at 29.

Patent Owner responds that Petitioner “has failed to demonstrate a need to drive that many functions,” because Petitioner has not identified any end effector that performs more than four functions, which the four drive elements on Tierney’s tool holder can accommodate without a shifter. PO Resp. 30. In its Reply, Petitioner asserts that “the [Whitman and Tierney] disclosures provide at least six functions applicable to Whitman’s linear

stapler/cutter: roll; clamp; horizontal articulation; vertical articulation; cut; and staple.” Pet. Reply 12.

Although there does not seem to be a dispute that the proposed combination of Whitman and Tierney would be able to perform more than four functions using Tierney’s four driven elements, Petitioner has not identified any surgical instrument known in the art at the time of the invention that performs more than four functions. We are not persuaded that one of ordinary skill in the art would have been motivated to combine references to obtain a functionality for which there was no known use. *See In re Nuvasive, Inc.*, 842 F.3d 1376, 1384 (Fed. Cir. 2016) (obtaining additional information is not a sufficient reason to combine references when it was not explained why the additional information would benefit a person of ordinary skill in the art). And even though Petitioner discerns “at least six functions” from Whitman and Tierney, Petitioner has not provided evidence that one of ordinary skill in the art would have interpreted the references in the same manner (e.g., that one of ordinary skill in the art would have considered cutting and stapling performed in the same instrument to be two separate functions as opposed to a single “firing” function), and does not explain why one of ordinary skill in the art would have developed a surgical instrument that performs all six functions.

We also understand Petitioner to be arguing that one of ordinary skill in the art would have been motivated to combine Whitman and Tierney so that Whitman’s device can perform Whitman’s four functions using only two of Tierney’s driven elements. Pet. 28; Pet. Reply 6–8. In this configuration, according to Petitioner, “the remaining two driven elements could be removed from the tool base,” and “the resulting instrument would

be compatible . . . with robot arms that only have two drives as well as those with four,” or “the extra drives could be used for other purposes.” Pet.

Reply 7. Petitioner does not, however, identify any evidence of the existence of robot arms with only two drives.¹⁰ Nor does Petitioner identify what purposes the extra drives could be put, or provide evidence in support of this proposition. While two driven elements could be removed from the tool base, Petitioner has not established that any resulting cost or weight savings would be greater than the additional weight and cost of the shifter mechanism.¹¹ Therefore, we are not persuaded that the reasons on which Petitioner relies convey that one of ordinary skill in the art would have combined Whitman and Tierney to reduce the number of driven elements needed to drive Whitman’s four functions.

¹⁰ We do not read Petitioner’s argument as suggesting that one of ordinary skill in the art would have modified Tierney’s robotic system to remove drive elements (*driven* elements are part of the tool, whereas *drive* elements, which operate the driven elements, are part of the robotic system). Nor are we aware of evidence in the record indicating that one of ordinary skill in the art would have considered modifying the robotic system in this manner.

¹¹ That does not mean that we accept Patent Owner’s contention, supported by Dr. Cimino’s testimony, that adding the shifter necessarily increases the overall number of parts included in the device, and therefore the weight, cost, and complexity of the device. See PO Resp. 34 (citing Ex. 2012 ¶ 81). Neither Patent Owner nor Dr. Cimino describes what structure one of ordinary skill in the art would have used in place of the shifter mechanism to operably couple Tierney’s four drive elements with Whitman’s four end-effector-function drivers. Therefore, we cannot rule out the possibility—if not likelihood—that additional parts would be necessary for this purpose.

c. Whether Whitman Provides a Reason to Combine

Petitioner next asserts that “Whitman itself describes the benefit of using its shifter mechanism as enabling a drive shaft to drive multiple functions.” Pet. 29 (citing Ex. 1003 ¶ 60). Petitioner notes that “Whitman describes a ‘surgical attachment’ wherein a ‘first rotatable drive shaft is configured, upon actuation, to cause selective engagement of one of the first, second, third and fourth drivers with the second rotatable drive shaft, and wherein the second rotatable drive shaft is configured to drive the selectively engaged one of the first, second, third and fourth drivers.’” *Id.* (citing Ex. 1004 ¶ 17). We do not find this argument availing. Petitioner merely quotes Whitman’s general description of the operation of its shifter mechanism. This discussion does not provide a reason to combine Whitman with Tierney.

d. Whether Tierney Provides a Reason to Combine

Petitioner next argues that “Tierney suggests its robotic surgical system may be combined with a variety of surgical instruments,” and teaches that its invention “‘provides surgical tools having improved mechanical and/or data interface capabilities to enhance the safety, accuracy, and speed of minimally invasive and other robotically enhanced surgical procedures.’” Pet. 29 (quoting Ex. 1005, 1:32–36). Petitioner similarly notes that, at the time of the invention, “there was a general trend to modify known surgical instrument types for use with surgical robots like the Tierney surgical robot” (*id.* at 31 (citing Ex. 1003 ¶ 63)), and that the ’431 patent “explicitly admits that there was a motivation to use Tierney’s surgical robot because it ‘increase[s] surgical dexterity [and] permit[s] a surgeon to operate

on a patient in an intuitive manner” (*id.* (quoting Ex. 1001, 26:11–31) (alterations made by Petitioner)).

Patent Owner responds that Petitioner has not adequately explained “how or why combining Whitman and Tierney would improve the safety, accuracy, or speed of surgery,” increase surgical dexterity, or permit a surgeon to operate in an intuitive manner. PO Resp. 36, 38. Patent Owner further asserts that Petitioner failed to cite any evidence to support the assertion that there was a general trend to modify known surgical instrument types for use with surgical robots, other than the testimony of Dr. Knodel, which testimony is itself unsupported. *Id.* at 48. Finally, Patent Owner asserts that even if Tierney suggests adapting surgical instruments for use with a robotic system, and there was a general trend to adapt surgical instruments for use with robotic systems, it “does not explain why a POSITA would have been motivated to include Whitman’s optional shifter mechanism.” *Id.* at 41–42.

We agree with Petitioner that Tierney teaches that its robotic system may be used with a variety of surgical instruments. Although Tierney’s list of tools does not specifically identify an endocutter, such as that taught by Whitman, the list is open-ended and therefore would have suggested to one of ordinary skill in the art that other known tools in the art may also have worked with Tierney. We also give weight to the statement in the ’431 patent that specifically identifies Tierney’s robotic system as one of a variety of minimally invasive robotic systems that “have been developed to increase surgical dexterity as well as to permit a surgeon to operate on a patient in an intuitive manner.” Ex. 1001, 26:11–25.

However, it does not necessarily follow that one of ordinary skill in the art would have included Whitman's shifter mechanism in the combined device. As discussed above, we find that the weight of the evidence supports Patent Owner's contention that Whitman suggests that the shifting mechanism is an optional component of Whitman's surgical device. We further find that one of ordinary skill in the art, in combining the teachings of Tierney and Whitman, would have viewed a shifter as unnecessary, because Tierney's four drive elements are capable of operating Whitman's four end effector functions. E.g., Ex. 2013, 38:21–39:4. Moreover, as discussed above, Petitioner has not established by a preponderance of the evidence that one of ordinary skill in the art would have had a reason to include the shifter in any combination of Whitman and Tierney. Petitioner's proposal in that regard appears rooted in the bias of hindsight rather than based on what a skilled artisan would have gleaned from the teachings of the prior art. *See Metalcraft of Mayville, Inc. v. The Toro Co.*, 848 F.3d 1358, 1367 (Fed. Cir. 2017) (“[W]e cannot allow hindsight bias to be the thread that stitches together prior art patches into something that is the claimed invention.”) Accordingly, we are not persuaded that one of ordinary skill in the art would have combined Whitman and Tierney in a way that would have satisfied all of the limitations of claim 1.

6. *Summary as to Claim 1*

Because we are not persuaded that one of ordinary skill in the art would have combined Whitman and Tierney in a way that would have satisfied all of the limitations of claim 1, we are not persuaded that claim 1 would have been obvious over Whitman and Tierney.

7. *Claims 2–6 and 10–13*

Claims 2–6 and 10–13 ultimately depend from claim 1. Petitioner asserts that either Tierney or Whitman teaches each of the additional limitations of these claims. Pet. 36–57. Because we are not persuaded that claim 1 would have been obvious over Whitman and Tierney, we likewise are not persuaded that claims 2–6 and 10–13 would have been obvious over Whitman and Tierney.

8. *Summary as to Ground 1*

We determine that Petitioner has failed to establish that claims 1–6 and 10–13 would have been obvious over Tierney and Whitman.

D. *Ground 2: Claims 7, 14, 16–20, and 23–26—Obviousness—Tierney, Whitman, and Zemlok*

For Ground 2, Petitioner contends that claims 7, 14, 16–20, and 23–26 would have been obvious over Tierney, Whitman, and Zemlock. Claim 7 depends from claim 6. Claim 6 depends from claim 1 and additionally recites that the transmission arrangement comprises a first control assembly, a second control assembly, and a transmission shifter assembly configured to, in response to control inputs from the robotic system's control unit, shift between first and second positions to apply the rotary output motion to the first and second control assemblies respectively. Claim 7 additionally recites that the transmission shifter assembly comprises:

- a shifter drive gear configured to receive said rotary output motion from said rotatable drive element of the tool drive assembly when said tool mounting portion is coupled thereto;

- a shifter shaft in meshing engagement with said shifter drive gear; and

- a shifter driven gear mounted on said shifter shaft such that rotation of said shifter shaft rotates said shifter driven gear and

wherein said shifter driven gear is selectively axially movable on said shifter shaft between said first position wherein said shifter driven gear is in driving engagement with said first control assembly and said second position wherein said shifter driven gear is in driving engagement with said second control assembly in response to said control inputs.

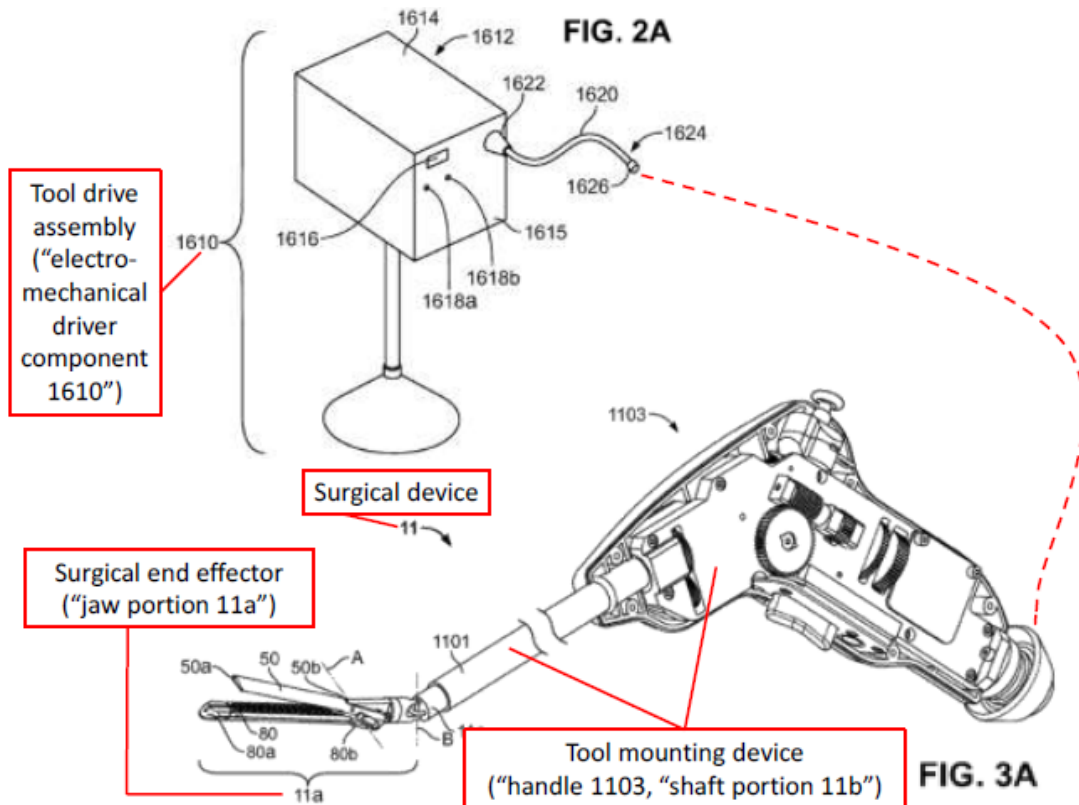
Independent claims 14 and 20 recite the same first control assembly, second control assembly, and transmission shifter assembly limitations of claim 7, and are otherwise similar to independent claim 1. Claims 16–19 ultimately depend from claim 14, and claims 23–26 ultimately depend from claim 20. Petitioner relies on the combination of Tierney and Whitman to teach all of the limitations in these claims that are also found in claim 1. Pet. 57–71. Petitioner also relies on the same arguments for why one of ordinary skill in the art would have combined Tierney and Whitman (*id.*), which we discussed above and found insufficient. Therefore, for the reasons set forth above, we are not persuaded that claims 7, 14, 16–20, and 23–26 would have been obvious over Tierney, Whitman, and Zemlok.

E. Ground 3: Claims 1, 2, 6, and 10–13—Anticipation—Whitman

1. Petitioner’s Contentions

For Ground 3, Petitioner asserts that Whitman anticipates claims 1, 2, 6, and 10–13. Pet. 71–86. In particular, Petitioner contends that Whitman discloses “[a] tool mounting device for coupling a surgical end effector . . . to a tool drive assembly of a robotic system,” as recited in claim 1. *Id.* at 71–73 (citing Ex. 1004 ¶¶ 70, 73, 212, 215, 217–218, 220, 230–232, Figs. 2A, 2B, 3A, 3B; Ex. 1003 ¶¶ 160, 162–164). According to Petitioner, Whitman’s handle 1103 corresponds to the claimed tool mounting portion, and electromechanical driver component 1610 corresponds to the claimed

tool drive assembly of a robotic system. *Id.* at 71 (citing Ex. 1004 ¶¶ 70, 73, 212, Figs. 2A, 2B, 3A, 3B). Petitioner asserts that the combination of electromechanical driver component 1610 and surgical device 11 is a “robotic system” because “it is a self-powered, steerable, computer-controlled device that can be programmed to aid in the positioning and manipulation of surgical instruments, and act as a remote extension of a human surgeon.” *Id.* at 72 (citing Ex. 1003 ¶¶ 162–164). Petitioner notes, for example, that Whitman’s electromechanical driver component 1610 comprises “controller 1122” that is “configured to control all functions and operations of the electro-mechanical driver component 1610 and the linear clamping, cutting and stapling device 11.” *Id.* (quoting Ex. 1004 ¶ 220). Petitioner also notes that Whitman’s surgical instrument “is steerable via steering cables attached to the flexible shaft [1620] connecting the instrument to the electro-mechanical driver.” *Id.* at 73 (citing Ex. 1003 ¶ 162; Ex. 1004 ¶¶ 212, 215, 217–218, 231–232). Petitioner contends that Whitman discloses the other limitations of claim 1 and of claims 2, 6, and 10–13, and supports its contentions with specific citations to Whitman and with Dr. Knodel’s testimony. Petitioner illustrates these contentions with a combined, annotated version of Figures 2A and 3A, reproduced below:



2. Patent Owner's Contentions

Patent Owner disputes that Whitman discloses a robotic system. Patent Owner construes “robotic system” to require “a system comprising a master controller and a robotic arm slave cart,” and contends that Whitman does not disclose a robotic arm slave cart. PO Resp. 54–55 (citing Ex. 2012 ¶¶ 37–40, 63–64).

Patent Owner also disputes that Whitman discloses the claimed tool mounting portion. *Id.* at 58–63. Patent Owner asserts that “handle 1103 is not a ‘tool mounting portion’ because it is not ‘mounted’ to anything.” *Id.* at 59 (citing Ex. 2012 ¶ 71). According to Patent Owner, “[a] POSITA would have understood that the coupling of handle 1103 to the flexible shaft does not ‘mount’ the handle to the flexible shaft because the flexible shaft does

not support the handle.” *Id.* (citing Ex. 2012 ¶ 71). Instead, Patent Owner contends, “after the instrument in Whitman couples to the flexible shaft, the user must hold the handle to support and position the instrument during use.” *Id.* at 60 (citing Ex. 2012 ¶ 71).

3. Discussion

On this record, we determine that Petitioner has shown by a preponderance of the evidence that Whitman discloses all of the limitations of claims 1, 2, 6, and 10–13. For claim 1, we are persuaded that Whitman’s handle 1103 and shaft portion 11b correspond to the claimed tool mounting device for coupling a surgical end effector (Whitman’s jaw portion 11a) to a tool drive assembly (electro-mechanical driver component 1610 and flexible shaft 1620) of a robotic system (electromechanical driver component 1610, controller 1122 or wireless remote control unit 1148, flexible shaft 1620, and surgical device 11). Ex. 1004 ¶¶ 70, 73, 212 220, 231, 236, Figs. 2A, 2B, 3A, 3B. We are further persuaded that surgical end effector 11 is configured to selectively perform at least two actions in response to control motions applied thereto. *Id.* ¶¶ 70, 71, 79–82; Figs. 2B, 3B.

We are also persuaded that Whitman’s handle 1103 corresponds to the claimed tool mounting portion. As discussed above, we construe “tool mounting portion” as a structure for operable attachment to the tool drive assembly of a robotic system, and which operably supports an elongated shaft assembly and a transmission arrangement. Whitman’s handle 1103 connects shaft portion 11b to flexible drive shaft 1620 such that jaw portion 11a can receive control signals from electro-mechanical driver component 1610. *Id.* ¶¶ 73, 210–211, 217, Figs. 2B, 11. Handle 1103 also functionally supports function selector block 1110, which corresponds to the claimed

transmission arrangement, as well as shaft portion 11b. *Id.* ¶¶ 70–79, Fig. 2B.

Alternatively, we find that Whitman’s handle 1103 corresponds to the claimed tool mounting portion even under Patent Owner’s construction of the term, which requires the tool mounting portion to be attached to a support. Whitman discloses that in one operating mode, flexible shaft 1620 is configured to become “taut and steerable,” allowing an operator to steer the position of surgical instrument 11—and thereby handle 1103—via flexible drive shaft 1620. *Id.* ¶ 218, Fig. 11. Shaft 1620 is clearly attached to handle 1103. Further, a shaft that is “taut and steerable” in permitting manipulation of the handle of a surgical instrument is reasonably viewed as supporting the handle. Accordingly, we find that in this mode flexible drive shaft 1620 supports handle 1103.

Petitioner has shown by a preponderance of the evidence that Whitman discloses the remaining limitations of claim 1, as well the additional limitations of dependent claims 2, 6, and 10–13. Pet. 75–86 (citing, e.g., Ex. 1001 ¶¶ 71–74, 76, 77, 79–82, 86, 89, 92, 93, 136, 139–169, 181, 194, 210, 212, 214, 217, 221, 226, 230). Patent Owner does not dispute that Whitman teaches these limitations.

4. *Summary*

In summary, we determine that Petitioner has shown by a preponderance of the evidence that Whitman anticipates claims 1, 2, 6, and 10–13.

*F. Ground 4: Claim 11—Obviousness—
Tierney, Whitman, and the Timm Application*

Claim 11 depends from claim 10, which depends from claim 1. The Timm Application is not relied on to cure the deficiencies noted above in the Tierney/Whitman combination. Accordingly, for the reasons set forth above, we are not persuaded that claim 11 would have been obvious over Tierney, Whitman, and the Timm Application.

III. CONCLUSION

For the foregoing reasons, we determine that Petitioner has shown by a preponderance of the evidence that claims 1, 2, 6, and 10–13 are unpatentable under 35 U.S.C. § 102 as anticipated by Whitman,¹² but has not shown by a preponderance of the evidence that claims 3–5, 7, 14, 16–20, and 23–26 are unpatentable as obvious under 35 U.S.C. § 103, as set forth in the following table:

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not shown Unpatentable
1–6, 10– 13	103	Tierney, Whitman		1–6, 10–13
7, 14, 16–	103	Tierney, Whitman,		7, 14, 16–20,

¹² Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner’s attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. § 42.8(a)(3), (b)(2).

20, 23–26		Zemlok		23–26
1, 2, 6, 10–13	102	Whitman	1, 2, 6, 10–13	
11	103	Tierney, Whitman, Timm Application		11
Overall Outcome			1, 2, 6, 10–13	3–5, 7, 14, 16–20, 23–26

IV. ORDER

For the reasons given, it is

ORDERED that claims 1, 2, 6, and 10–13 have been shown to be unpatentable;

FURTHER ORDERED that claims 3–5, 7, 14, 16–20, and 23–26 have not been shown to be unpatentable; and

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

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Patent 8,616,431 B2

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