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571-272-7822

Paper 40
Date: January 13, 2020

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INTUITIVE SURGICAL, INC.,
Petitioner,

v.

ETHICON LLC,
Patent Owner.

IPR2018-01247
Patent 8,479,969 B2

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

MEYERS, *Administrative Patent Judge*.

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

I. INTRODUCTION

Intuitive Surgical, Inc. ("Petitioner") filed a Petition (Paper 2, "Pet.") requesting an *inter partes* review of claims 19–26 of U.S. Patent No. 8,479,969 B2 (Ex. 1001, "the '969 patent"). Ethicon LLC ("Patent Owner") filed a Preliminary Response (Paper 6, "Prelim. Resp.") to the Petition. After the filing of the Petition, Patent Owner filed a statutory disclaimer of claim 23. Ex. 2002; *see* Prelim. Resp. 3–4. In our Decision on Institution (Paper 7, "Dec. on Inst."), we determined that the information presented in the Petition and Preliminary Response established a reasonable likelihood that Petitioner would prevail in its challenge of claims 19–22 and 24–26[1] of the '969 patent as unpatentable under 35 U.S.C. § 103 and, accordingly, we instituted *inter partes* review as to those claims. *See* 35 U.S.C. § 314(a) (2012).

During the course of trial, Patent Owner filed a Patent Owner Response (Paper 14, "PO Resp."), Petitioner filed a Reply to Patent Owner Response (Paper 18, "Pet. Reply"), and Patent Owner filed a Sur-reply to Petitioner's Reply (Paper 25, "PO Sur-reply"). A combined hearing for this case and related cases IPR2018-01248 and IPR2018-01254 was held on October 17, 2019, and a transcript of the hearing is included in the record. Paper 37.

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

[1] In our Decision on Institution, we treated claim 23 as having never been part of the '969 patent and did not institute *inter partes* review of this claim. *See* Dec. on Inst. 2, n. 1.

unpatentability by a preponderance of the evidence. *See* 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d) (2017).

This decision is a Final Written Decision under 35 U.S.C. § 318(a) as to the patentability of claims 19–22 and 24–26 of the '969 patent. For the reasons discussed below, we hold that Petitioner has demonstrated by a preponderance of the evidence that claims 19 and 20 of the '969 patent are unpatentable under § 103(a). We also hold that Petitioner has not demonstrated by a preponderance of the evidence that claims 21, 22, and 24–26 of the '969 patent are unpatentable under § 103(a).

II. BACKGROUND

A. The '969 Patent

The '969 patent issued July 9, 2013 from an application filed February 9, 2012, and claims priority, as a continuation, to an application filed May 27, 2011, which claims priority, as a continuation-in-part, to an application filed January 10, 2007. Ex. 1001, codes (45), (22), (63).[2] The '969 patent is titled "Drive Interface for Operably Coupling a Manipulatable Surgical Tool to a Robot," and generally relates to endoscopic surgical instruments. *Id.* at code (54), 1:54–57. The '969 patent summarizes its disclosure as encompassing a surgical instrument "for use with a robotic system that has a control unit and a shaft portion," which together with an electrically conductive elongated member, "transmit[s] control motions from the robotic system to an end effector." *Id.* at code (57). Figure 26 of the '969 patent is reproduced below:

[2] The Leahy-Smith America Invents Act ("AIA") included revisions to 35 U.S.C. § 100 *et seq.* effective on March 16, 2013. Because the '969 patent issued from an application filed before March 16, 2013, we apply the pre-

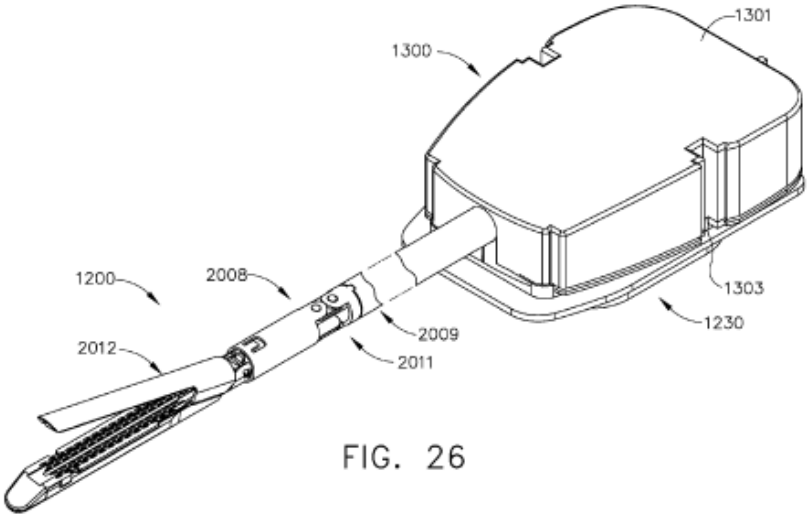

FIG. 26

Figure 26 depicts "a perspective view of a surgical tool embodiment of the present invention." *Id.* at 5:19–20. Figure 26 illustrates surgical tool 1200 with end effector 2012, elongated shaft assembly 2008, and articulation joint 2011. *Id.* at 24:66–25:5. The '969 patent describes that surgical tool 1200 is coupled to a robotic manipulator (not shown) by tool mounting portion 1300. *Id.* at 25:5–7.

Figure 31 of the '969 patent is reproduced below:

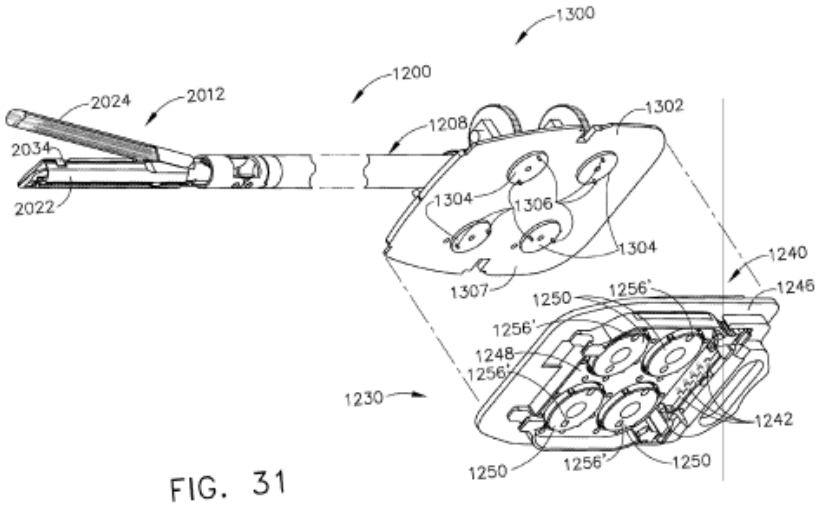

FIG. 31

AIA versions of the statutory bases for unpatentability.

Figure 31 depicts "a partial bottom perspective view of the surgical tool embodiment of FIG. 26." *Id.* at 5:27–28. Figure 31 illustrates that "tool mounting portion 1300 includes a tool mounting plate 1302 that operably supports a plurality of (four are shown in FIG. 31) rotatable body portions, driven discs or elements 1304, that each include a pair of pins 1306 that extend from a surface of the driven element 1304." *Id.* at 25:11–16. Figure 31 further depicts that "[i]nterface 1230 includes an adaptor portion 1240 that is configured to mountingly engage the mounting plate 1302." *Id.* at 25:19–22. The '969 patent describes that "adapter portion 1240 generally includes a tool side 1244 and a holder side 1246." *Id.* at 25:30–31.

Figure 27 of the '969 patent is reproduced below:

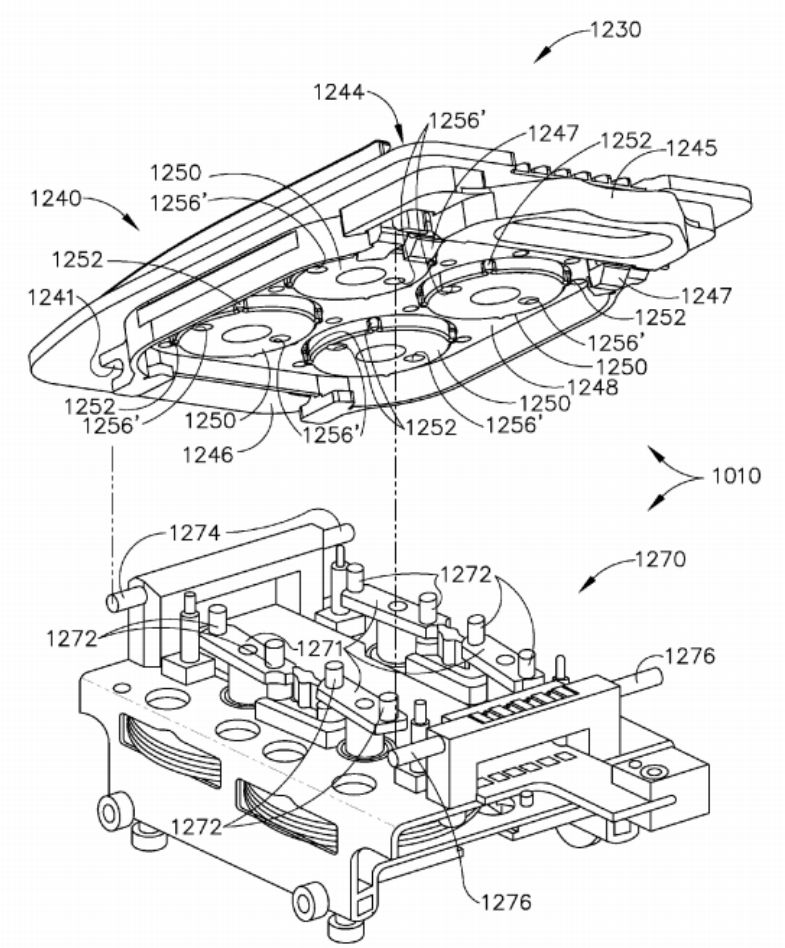

FIG. 27

Figure 27 depicts "an exploded assembly view of an adapter and tool holder arrangement for attaching various surgical tool embodiments to a robotic system." *Id.* at 5:21–23. More particularly, Figure 27 illustrates that tool drive assembly 1010 "is operatively coupled to a master controller 1001." *Id.* at 24:62–66.

B. The Challenged Claims

Petitioner challenges claims 19–22 and 24–26 of the '969 patent. Challenged claims 19, 21, and 24 are independent. Claim 20 ultimately depends from claim 19, claim 22 ultimately depends from claim 21, and

claims 25 and 26 ultimately depend from claim 24. Claims 19 and 24 are illustrative and are reproduced below:

> 19. A surgical tool for use with a robotic system that has a tool drive assembly that is operatively coupled to a control unit of the robotic system that is operable by inputs from an operator and is configured to provide at least one rotary output motion to at least one rotatable body portion supported on the tool drive assembly, said surgical tool comprising:
>
> a surgical end effector comprising:
>
> a surgical staple cartridge; and
>
> a cutting instrument that is axially movable within said surgical staple cartridge between a starting position and an ending position in response to control motions applied thereto and wherein said surgical tool further comprises:
>
> an elongated shaft assembly operably coupled to said surgical end effector, said elongated shaft assembly comprising at least one gear-driven portion comprising a knife bar that is movably supported within said elongated shaft assembly for selective axial travel therein, said knife bar interfacing with said cutting instrument;
>
> a tool mounting portion operably coupled to said elongated shaft assembly, said tool mounting portion being configured to operably interface with the tool drive assembly when coupled thereto, said tool mounting portion comprising:
>
> a driven element rotatably supported on said tool mounting portion and configured for driving engagement with a corresponding one of the at least one rotatable body portions of the tool drive assembly to receive corresponding rotary output motions therefrom; and
>
> a transmission assembly in operable engagement with said driven element and in meshing engagement with the knife bar to apply actuation motions thereto to cause said knife bar to apply at least one control motion thereto.

Ex. 1001, 93:25–56.

> 24. A surgical tool for use with a robotic system that has a tool drive assembly that is operatively coupled to a control unit of the robotic system that is operable by inputs from an operator and is configured to provide at least one rotary output motion to at least one rotatable body portion supported on the tool drive assembly, said surgical tool comprising:
>
> a surgical end effector comprising at least one component portion that is selectively movable between first and second positions relative to at least one other component portion thereof in response to control motions applied to said selectively movable component portion;
>
> an elongated shaft assembly defining a longitudinal tool axis and comprising:
>
> a distal spine portion operably coupled to said end effector; and
>
> a proximal spine portion pivotally coupled to said distal spine portion at an articulation joint to facilitate articulation of said surgical end effector about an articulation axis that is substantially transverse to said longitudinal tool axis; and
>
> at least one gear-driven portion that is in operable communication with said at least one selectively movable component portion of said surgical end effector and wherein said surgical tool further comprises:
>
> a tool mounting portion operably coupled to a proximal[3] end of said proximal spine portion, said tool mounting portion being configured to operably interface with the tool drive assembly when coupled thereto, said tool mounting portion comprising:

[3] A Certificate of Correction, mailed January 23, 2018, deleted the term "distal" here in claim 24 of the '969 patent, and inserted in its place the term "proximal." Ex. 1002, 686.

> a driven element rotatably supported on said tool mounting portion and configured for driving engagement with a corresponding one of the at least one rotatable body portions of the tool drive assembly to receive corresponding rotary output motions therefrom; and
>
> a transmission assembly in operable engagement with said driven element and in meshing engagement with a corresponding one of said at least one gear-driven portions to apply actuation motions thereto to cause said corresponding one of said at least one gear driven portions to apply at least one control motion to said selectively movable component.

Id. at 95:35–96:14.

C. Related Proceedings

The parties indicate that the ’969 patent is involved in *Ethicon LLC v. Intuitive Surgical, Inc.*, No. 1:17-cv-00871 in the United States District Court for the District of Delaware (“the Delaware litigation”).[4] Pet. 6; Paper 4, 2.

Petitioner is also challenging the ’969 patent as well as other related patents in the following proceedings before the Board: (1) Case No. IPR2018-00933 (the ’601 patent); (2) Case No. IPR2018-00934 (the ’058 patent); (3) Case No. IPR2018-00938 (the ’874 patent); (4) Case Nos. IPR2018-01248 and IPR2018-01254 (the ’969 patent); (5) Case No. IPR2018-00936 (the ’658 patent); (6) Case No. IPR2018-01703 (the ’431

[4] Patent Owner contends that U.S. Patent Nos. 9,585,658 B2 (“the ’658 patent”), 8,616,431 B2 (“the ’431 patent”), 9,113,874 B2 (“the ’874 patent”), 9,113,874 B2 (“the ’874 patent”), 9,084,601 B2 (“the ’601 patent”), and 8,998,058 B2 (“the ’058 patent”) are also asserted in the Delaware litigation. Paper 4, 2–3

patent); and (7) Case No. IPR2019-00880 (U.S. Patent No. 7,490,749).

D. Real Parties in Interest

Petitioner identifies itself as the only real party in interest. Pet. 1. Patent Owner identifies itself as a real party in interest. Paper 4, 2. Patent Owner indicates that it is "an indirect subsidiary of Johnson & Johnson." *Id.*

E. Evidence Relied Upon

Petitioner relies on the following references in asserting that claims 19–22 and 24–26 of the '969 patent are unpatentable:

Reference	**Exhibit No.**
U.S. Patent No. 6,699,235 B2 issued Mar. 2, 2004 ("Wallace")	1008
U.S. Patent No. 6,783,524 B2 issued Aug. 31, 2004 ("Anderson")	1010
U.S. Patent No. 7,510,107 B2 issued Mar. 31, 2009 ("Timm")	1011
U.S. Patent No. 5,465,895 issued Nov. 14, 1995 ("Knodel")	1012
U.S. Patent No. 5,954,259 issued Sept. 21,1999 ("Viola")	1013

F. Instituted Grounds of Unpatentability

We instituted review of claims 19–22 and 24–26 of the '969 patent based on the following asserted grounds of unpatentability. Pet. 1–91.

References	35. U.S.C. §	Claims Challenged
Anderson, Timm	103	24
Anderson, Timm, Wallace	103	25, 26
Anderson, Knodel	103	19, 20
Anderson, Viola	103	21, 22

In support of its asserted grounds of unpatentability, Petitioner relies on the testimony of its expert witness, Dr. Bryan Knodel. Ex. 1004 ("Knodel Decl."); Ex. 1017 ("Knodel Supp. Decl."). In support of its response, Patent Owner relies on the testimony of its expert witness, Dr. Shorya Awtar. Ex. 2006 ("Awtar Decl."). Patent Owner also relies on the testimony of Dr. Elliott Fegelman. Ex. 2007 ("Fegelman Decl."). Dr. Knodel and Dr. Awtar were both cross-examined. *See* Ex. 1019 (deposition transcript of Dr. Shorya Awtar, "Awtar Dep. I"); Ex. 2010 (deposition transcript of Dr. Bryan Knodel, "Knodel Dep.").

III. ANALYSIS

A. Claim Construction

In an *inter partes* review filed before November 13, 2018, such as this one, a claim in an unexpired patent shall be given its broadest reasonable construction in light of the specification of the patent in which it appears.[5] 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131,

[5] This Petition was filed before the effective date of the amendment to 37 C.F.R. § 42.100 that changed the claim construction standard applied in *inter partes* reviews. *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) (amending 37 C.F.R. § 42.100(b) effective November 13, 2018). Thus, we use the broadest reasonable interpretation claim construction standard for this proceeding.

2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard). Consistent with the broadest reasonable construction, claim terms are presumed to have their ordinary and customary meaning as understood by a person of ordinary skill in the art in the context of the entire patent disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). The presumption may be overcome by providing a definition of the term in the specification with reasonable clarity, deliberateness, and precision. *See In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). In the absence of such a definition, limitations are not to be read from the specification into the claims. *See In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993). Only those terms that are in controversy need be construed, and only to the extent necessary to resolve the controversy. *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999); *see also Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (applying *Vivid Techs.* in the context of an *inter partes* review).

Here, neither Petitioner nor Patent Owner identifies terms for construction or provides any proposed constructions. Pet. 10; PO Resp. 12; *see generally* Pet. Reply. Instead, the parties agree that the challenged claims of the '969 patent should be construed according to their broadest reasonable interpretation. Pet. 10; PO Resp. 12. We determine that no claim term needs express interpretation. *See Vivid Techs.*, 200 F.3d at 80 ("[O]nly those terms need be construed that are in controversy, and only to the extent

necessary to resolve the controversy.").

B. Level of Ordinary Skill in the Art

Petitioner's expert, Dr. Knodel, testifies the following in connection with the level of ordinary skill in the art:

> A person of ordinary skill in the art at the time of the alleged invention ("POSITA") 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. Additional 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 requirements stated above.

Ex. 1004 ¶ 24.

Patent Owner does not appear to dispute Petitioner's definition of one of ordinary skill in the art. *See generally* PO Resp. Neither party argues that the outcome of this case would differ based on our adoption of any particular definition of one of ordinary skill in the art. In light of the record now before us, we adopt Petitioner's definition of one of ordinary skill in the art. The level of ordinary skill in the art is consistent with the references themselves. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) ("[T]he absence of specific findings on the level of skill in the art does not give rise to reversible error 'where the prior art itself reflects an appropriate level and a need for testimony is not shown.'"); *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (finding that the Board of Patent Appeals and Interferences did not err in concluding that the level of ordinary skill in the art was best determined by the references of record).

C. Post-Institution Summary

In our Decision on Institution, we concluded that the arguments and

evidence advanced by Petitioner demonstrated a reasonable likelihood that: (1) claim 24 of the '969 patent is unpatentable under 35 U.S.C. § 103(a) over Anderson and Timm; (2) claims 25 and 26 of the '969 patent are unpatentable under 35 U.S.C. § 103(a) over Anderson, Timm, and Wallace; (3) claims 19 and 20 of the '969 patent are unpatentable under 35 U.S.C. § 103(a) over Anderson and Knodel; and (4) claims 21 and 22 of the '969 patent are unpatentable under 35 U.S.C. § 103(a) over Anderson and Viola. Dec. on Inst. 11–45.

We must now determine whether Petitioner has established by a preponderance of the evidence that the specified claims are unpatentable over the cited prior art. 35 U.S.C. § 316(e). We previously instructed Patent Owner that "any arguments for patentability not raised in the [Patent Owner Response] will be deemed waived." Paper 8, 5; *see also In re NuVasive, Inc.*, 842 F.3d 1376, 1379–1382 (Fed. Cir. 2016) (holding patent owner waived argument addressed in preliminary response by not raising argument in the patent owner response); 37 C.F.R. § 42.23(a) ("Any material fact not specifically denied may be considered admitted."). Additionally, the Board's Trial Practice Guide states that the patent owner response "should identify all the involved claims that are believed to be patentable and state the basis for that belief." Patent Trial and Appeal Board Consolidated Trial Practice Guide 66 (Nov. 2019), *available at* https://www.uspto.gov/sites/default/files/documents/tpgnov.pdf.

D. Ground 2: Claim 24 – Obviouness over Anderson and Timm[6]

Petitioner contends that claim 24 would have been obvious over

[6] We begin our analysis with Ground 2 because Ground 1, as asserted in the Petition, challenged disclaimed claim 23 and, thus, is not addressed in the

Anderson and Timm. Pet. 29–56.

1. Principles of Law

A claim is unpatentable under § 103(a) 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 skill in the art; and (4) when in evidence, objective indicia of non-obviousness (i.e., secondary considerations). *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). We analyze this asserted ground based on obviousness with the principles identified above in mind.[7]

2. Overview of Anderson (Ex. 1010)

Anderson is titled "Robotic Surgical Tool with Ultrasound Cauterizing and Cutting Instrument." Ex. 1010, code (54). Anderson's Abstract reads in part as follows:

> A surgical instrument for enhancing robotic surgery generally includes an elongate shaft with an ultrasound probe, an end effector at the distal end of the shaft, and a base at the proximal end of the shaft. The end effector includes an ultrasound probe tip and the surgical instrument is generally configured for convenient positioning of the probe tip within a surgical site by a robotic surgical system. Ultrasound energy

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[7] We note that the record does not contain any evidence or argument directed to objective indicia of non-obviousness.

> delivered by the probe tip may be used to cut, cauterize, or achieve various other desired effects on tissue at a surgical site. In various embodiments, the end effector also includes a gripper, for gripping tissue in cooperation with the ultrasound probe tip. The base is generally configured to removably couple the surgical instrument to a robotic surgical system and to transmit forces from the surgical system to the end effector, through the elongate shaft.

Id. at code (57). Figure 2 of Anderson is reproduced below.

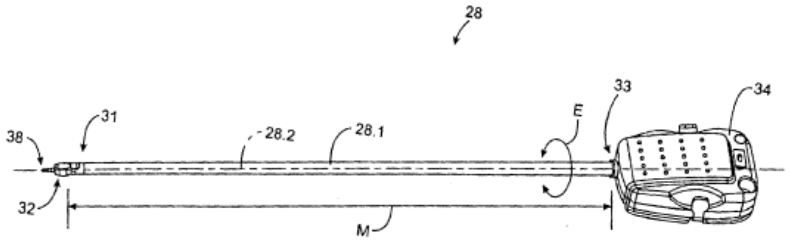

FIG. 2

Figure 2 depicts a perspective view of a robotic surgical tool that may be used with a robotic surgical system according to the present invention. *Id.* at 8:30–31. More particularly, Figure 2 illustrates a surgical instrument 28, which "includes an elongate shaft 28.1 having a proximal end 33 and a distal end 31, a pivot 32 and end effector 38 disposed at the distal end, and an instrument base 34 disposed at the proximal end." *Id.* at 11:32–36. Anderson further discloses:

> Base 34 is generally configured to releasably engage a robotic surgical system, such as robotic surgical system 10 in FIG. 1. In general, instrument 28 is engaged with system via base 34 (base not shown in FIG. 1) such that instrument 28 is releasably mountable on a carriage 37 which can be driven to translate along a linear guide formation 38 of the arm 26 in the direction of arrows P.

Id. at 11:36–42.

Figure 10 of Anderson is reproduced below.

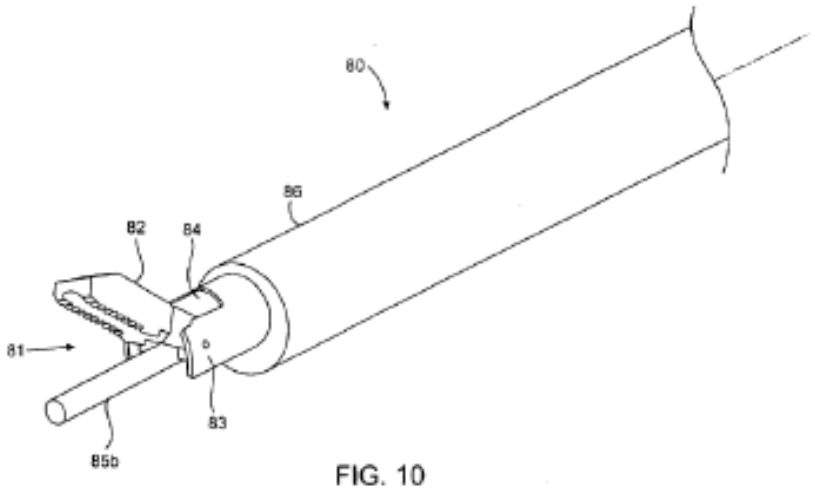

FIG. 10

Figure 10 depicts a perspective view of a distal portion of a robotic surgical tool according to the present invention. Ex. 1010, 8:58–60. More particularly, Figure 10 illustrates a distal portion of a robotic surgical instrument 80, which "includes a shaft 84, covered by a sheath 86, with an end effector 81 at the distal end of shaft 84. End effector 81 includes a gripper 82 hingedly attached to shaft 84 at a hinge 83." *Id.* at 15:29–55.

Figures 14A and 14B of Anderson are reproduced below.

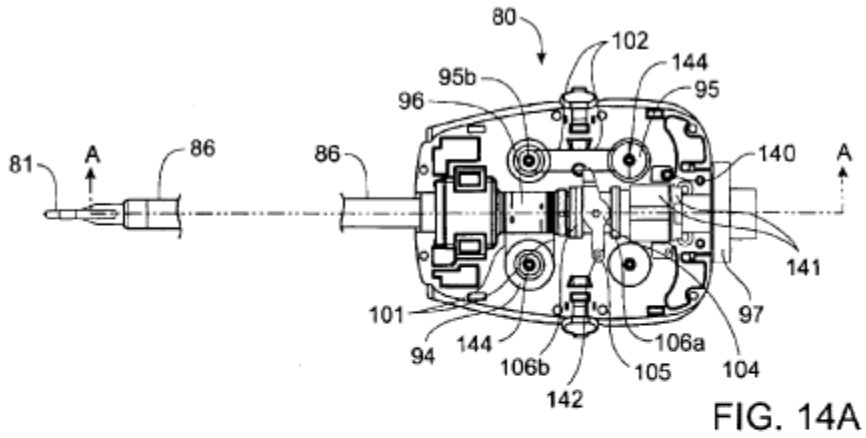

FIG. 14A

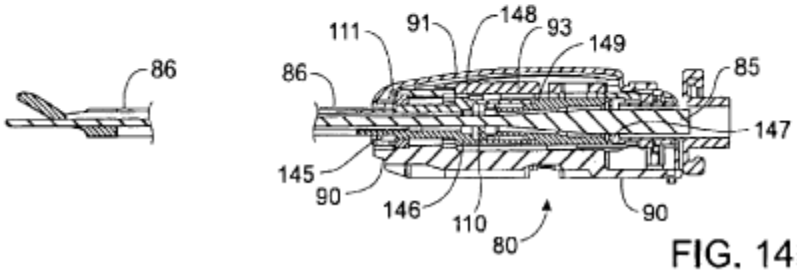

FIG. 14B

Figures 14A and 14B depict a top view and side view, respectively, of a tool base according to the present invention. *Id.* at 9:15–18. More particularly, Figures 14A and 14B illustrate tool base 90 including one or more "drive shafts 144 for coupling pulleys with a robotic surgical system." *Id.* at 17:10–13. Anderson discloses that "gripper 82 of end effector 81 is movable by one or more actuator rods housed within shaft 86" and "force for actuating the rod is supplied by actuator spool 95 which engages an interface member (not shown) on a robotic surgical system." *Id.* at 16:62–66. Anderson also describes that force for actuating the one or more rods may be provided alternatively by "a gear train or other mechanical transmission means, e.g., a right-angled helical gear pair, may be used to rotationally couple the interface member 344 with the receiver 335." *Id.* at 23:26–30.

3. Overview of Timm (Ex. 1011)

Timm is titled "Cable Driven Surgical Stapling and Cutting Instrument with Apparatus for Preventing Inadvertent Cable Disengagement." Ex. 1011, code (54). Timm's Abstract reads as follows:

> A cable driven surgical instrument that has an elongate channel assembly that is constructed to operably support a staple cartridge assembly therein. The instrument may have a knife assembly that is oriented for travel within the elongate channel assembly and at least one cable transition support that is operably mounted to at least one of the elongate channel assembly and the knife assembly. A drive cable operably extends around at least a portion of the cable transition support and interfaces with a cable drive system to drive the knife assembly within the elongate channel. A cable retention arrangement may be included for retaining the drive cable around at least a portion of the cable transition support.

Id. at code (57). Figure 1 of Timm is reproduced below.

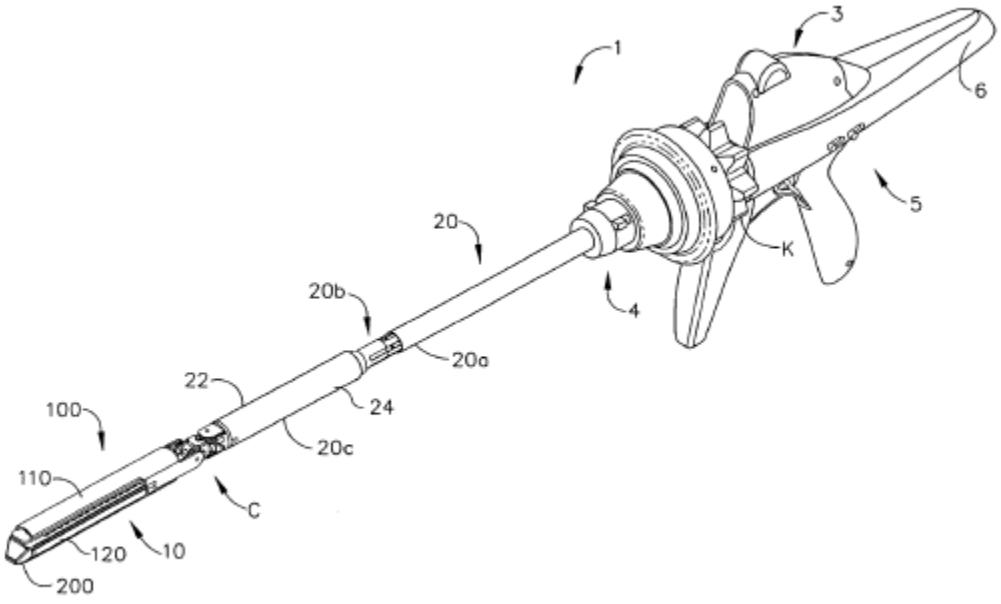

FIG. 1

Figure 1 depicts "a perspective view of a surgical stapling and severing instrument." *Id.* at 3:1–3. More particularly, Figure 1 depicts that surgical instrument 1

> may include a housing 3 that has distal and proximal ends 4 and 6, respectively, an elongated shaft 20 mounted to housing 3, preferably to its distal end 4, and a handle assembly generally designated as 5. Shaft 20 may have a distal end 20*a* to which may be operatively attached by attachment mechanism 20*b* to a disposable loading unit 10. As also shown in FIG. 1, disposable loading unit (DLU) 10 may comprise a tool assembly 100 and a shaft connector portion 20*c* which may be pivotally and operatively attached to each other through connector mechanism C.

Id. at 7:49–58. Timm discloses "[a] handle assembly for actuating the approximation member(s) can be selected from a variety of actuating mechanisms including toggles, rotatable and slideable knobs, pivotable levers or triggers, and any combination thereof." *Id.* at 11:64–12:1. To accomplish this, Timm describes that proximal end 24 of its shaft "can be permanently or removably associated with a handle or other actuating assemblies of a manually (or other, e.g., robotic or computer) operated open or endoscopic surgical stapler 1." *Id.* at 8:3–8; *see also id.* at 12:1–3, 28:45–49.

4. Discussion

Petitioner contends that claim 24 of the '969 patent would have been obvious in view of the combined teachings of Anderson and Timm. Pet. 29–56. We have reviewed the Petition, Patent Owner Response, Petitioner Reply, Patent Owner Sur-reply, as well as the relevant evidence discussed in those papers and other record papers, and as discussed in greater detail below, we determine that Petitioner has failed to make the requisite showing

to support its contention that claim 24 of the '969 patent would have been obvious in view of the combined teachings of Anderson and Timm.

5. Petitioner's Contentions

The preamble[8] of independent claim 24 sets forth

> [a] surgical tool for use with a robotic system that has a tool drive assembly that is operatively coupled to a control unit of the robotic system that is operable by inputs from an operator and is configured to provide at least one rotary output motion to at least one rotatable body portion supported on the tool drive assembly.

Ex. 1001, 95:35–40. Petitioner asserts that Anderson discloses a surgical instrument that is "configured to releasably engage a robotic surgical system." Pet. 32; *see also id.* at 13 (citing Ex. 1010, 16:7–23; 11:32–42; 10:65–11:31; 4:7–11, Fig. 2; Ex. 1004 ¶¶ 47–51). Petitioner asserts that Anderson discloses that "'surgical work station' 20 (which includes the tool drive assembly) [is] operatively coupled to 'control station 12,'" and is "operable [using] inputs from 'a surgeon or other user.'" Pet. 32; *see also id.* at 13–15 (citing Ex. 1010, 10:21–64, 10:40–64, 11:59–65, 5:61–6:8, Fig. 1; Ex. 1004 ¶¶ 47–51). Petitioner provides the following Figure 3 of Anderson, annotated to show shafts 70.1, 72.1, 74.1, and 76.1:

[8] We need not decide whether the preamble of claim 24 is limiting for purposes of this Decision, because Petitioner has shown that the cited art teaches the preamble.

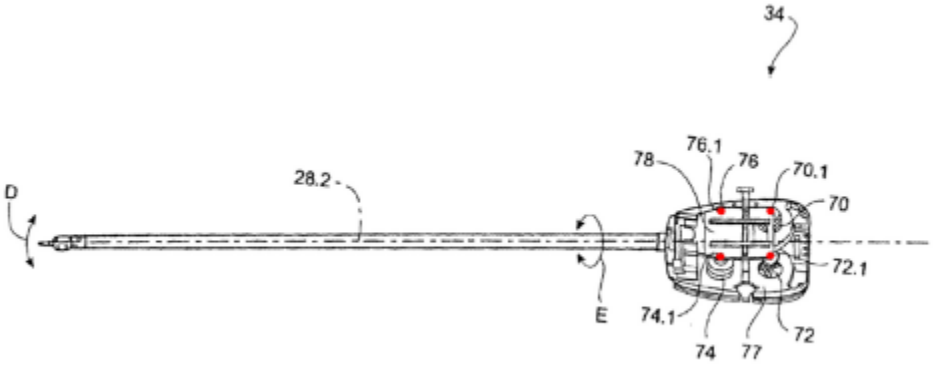

FIG. 3

Figure 3 is a "perspective illustration of [Anderson's] robotic surgical tool . . . with a cover of a tool base removed to show internal structures of the tool base." Ex. 1010, 8:33–35. Petitioner explains that "[t]he engaging members of the robotic arm assembly receive rotary motion from 'actuators' such as 'electric motors or the like, to cause selective angular displacement of each engaging member' to cause 'angular displacement' (e.g., rotation) of the spools or gears mounted on the rotatable shafts within the base 34." Pet. 15 (citing Ex. 1010, 11:66–12:22, code (57), Fig. 3; Ex. 1004 ¶ 51); *see also* Pet. 32.

Petitioner also explains how Anderson and Timm account for each of: (1) an "end effector . . . that is selectively movable . . . relative to at least one other component portion thereof in response to control motions applied to said selectively movable component portion" (Pet. 32–34); (2) "an elongated shaft . . . comprising: a distal spine portion operably coupled to said end effector; and a proximal spine portion pivotally coupled to said distal spine portion at an articulation joint" (*id.* at 34–39); (3) "at least one gear-driven portion that is in operable communication with said at least one selectively movable component portion" (*id.* at 39–51); (4) "a tool mounting portion

operably coupled to a [proximal][9] end of said proximal spine portion . . . to operably interface with the tool drive assembly" (*id.* at 51–52); (5) "a driven element rotatably supported on said tool mounting portion and configured for driving engagement with a corresponding one of the at least one rotatable body portions of the tool drive assembly to receive corresponding rotary output motions therefrom" (*id.* at 52–54); and, finally, (6) "a transmission assembly in operable engagement with said driven element and in meshing engagement with a corresponding one of said at least one gear-driven portions to apply actuation motions thereto to cause said corresponding one of said at least one gear-driven portions to apply at least one control motion to said selectively movable component" (*id.* at 54–56).

In connection with the requirement noted above of "a proximal spine portion pivotally coupled to said distal spine portion at an articulation joint to facilitate articulation of said surgical end effector," Petitioner further asserts that Timm discloses an articulating surgical stapler. Pet. 30, 34–39 (citing Ex. 1011, 2:25–55, 1:42–53, 22:56–65; 9:2–4, code (57), Figs. 1, 52). Petitioner explains that "[a] POSITA would have been motivated to use Timm's end effector with Anderson for several reasons." Pet. 31–32, 38–39 (citing Ex. 1010, 6:43–54, 7:15–23, 9:12–21, 11:59–65; Ex. 1011, 8:3–16; 13:4–26, 28:41–29:3; 35:36–63; Ex. 1004 ¶¶ 75–83, 89–91). For example, Petitioner contends that "a POSITA would have recognized that such a configuration would provide 'the ability to articulate in multiple directions relative to the proximal spine segment,' thereby allowing a surgeon to better

[9] As noted above, on January 23, 2018, the PTO entered a Certificate of Correction replacing the word "distal" with the word "proximal." *See* Ex. 1002, 686.

approach a surgical site from the correct angle, improve performance, and increase utility of the device." Pet. 38 (citing Ex. 1011, 22:56–65, 9:2–4; Ex. 1004 ¶¶ 89, 90). Petitioner reasons that "Anderson contemplates that its instruments will provide 'wrist-like rotational or pivotal joint' movements, and Timm provides the necessary details for implementing such a joint" (Pet. 38 (citing Ex. 1010, 6:43–54; Ex. 1004 ¶ 90)). According to Petitioner,

> Timm provides details on how to construct a particular surgical stapler and provide the various drive mechanisms for use with such a surgical stapler. A POSITA would have recognized that the proximal and distal spine segments connected via an articulation joint of Timm's surgical stapler would provide the benefits of increased directional control within a patient.

Pet. 38 (citing Ex. 1010, 7:15–25; Ex. 1011, 8:3–16, 28:41–29:3, 35:36–63; Ex. 1004 ¶ 90). Petitioner concludes that

> a POSITA would have been prompted to combine Anderson and Timm to use Timm's surgical stapler adapted for use with the Anderson robotic system because doing so would be merely the application of a known technique (surgical stapler design) to a known system (e.g., Anderson's surgical robot) ready for improvement to yield predictable results. [Ex.]1004, ¶9[0]; *KSR*, 550 U.S. at 417. Here, both Anderson and Timm disclose surgical instruments having shafts and end effectors and configured to releasably couple to a robotic surgical system, and a POSITA would have recognized that applying Timm's suggestions to Anderson's surgical instrument would have led to predictable results without significantly altering or hindering the functions performed by Anderson's surgical instrument.

Pet. 39 (citing Ex. 1004 ¶ 90).

And, in connection with the requirement noted above of "at least one gear-driven portion that is in operable communication with said at least one selectively movable component portion of said surgical end effector," Petitioner asserts that "[a]lthough Anderson is primarily directed toward

embodiments that rely on spool-and-cable assemblies to drive motion of the end effector, Anderson also contemplates 'other actuation interface devices' such as 'a gear train or other mechanical transmission means." Pet. 39 (citing Ex. 1010, 15:48–60, 16:62–17:9, 23:25–36). Given that Anderson contemplates other mechanical transmission means, Petitioner explains

> [a] POSITA would have understood that the combination of Anderson and Timm would include Timm's surgical stapler end effector and shaft (as described above), and would have included part or all of any of the specific gear-driven actuation assemblies described by Timm to drive the motions of Timm's surgical tool.

Pet. 45 (citing Ex. 1004 ¶ 98). Petitioner reasons that "a POSITA would have understood that in the combination of Anderson and Timm, the surgical stapler end effector, closure tube, and actuation assemblies of Timm (as described above) would be driven by Anderson's rotary robotic interface in the tool mounting portion." Pet. 50–51 (citing Ex. 1004 ¶ 104).

6. Patent Owner's Contentions

Patent Owner contends that Petitioner's ground of unpatentability based on Anderson and Timm is deficient. PO Resp. 1–4, 25–40; PO Sur-reply 1–3, 11–23. More particularly, Patent Owner argues that one of ordinary skill in the art would not have been motivated to combine the teachings of Anderson and Timm because Timm utilizes a "passive articulation joint," which "lack[s] the tactile feedback that is necessary in order to perform passive articulation safely and effectively" (PO Resp. 2, 28–31; PO Sur-reply 11–18).

7. Analysis

Patent Owner asserts that a person of ordinary skill in the art would not "have been motivated to combine the passive articulation disclosed in

Timm with the robotic tool and system in Anderson." PO Resp. 28; PO Sur-reply 11–18. Patent Owner explains that "performing passive articulation safely . . . requires real-time, tactile feedback to ensure that excessive forces are not applied to the instrument or another structure, such as an internal body part." PO Resp. 29 (citing Ex. 2007 ¶ 19). Thus, Patent Owner argues that "a POSITA would not have combined a passive articulation joint with a robotic tool given the lack of feedback available in a robotic system and the need for feedback in order to use a passive articulation joint safely and effectively." PO Resp. 30 (citing Ex. 2006 ¶¶ 73–76).

In response, Petitioner asserts that one of ordinary skill in the art would have been motivated to combine Anderson and Timm. Pet. Reply 10 (citing Ex. 1004 ¶¶ 83–114). More particularly, Petitioner argues that "there is no credible evidence that 'tactile feedback' is required, and second, the Anderson/Timm combination has tactile feedback." Pet. Reply 10. Petitioner's argument is not persuasive.

Initially, we agree with Petitioner that Anderson's robotic surgical tool discloses providing a surgeon with "tactile feedback" utilizing "one or more electrical motors, transmission gearing, position encoders, torque sensors, feedback sensors, and the like, and may transmit feedback or sensor signals to the robotic surgical system via the interface." Ex. 1010, 6:32–36; *see also id.* at 2:63–3:1 ("The control system typically includes at least one processor which relays input commands from the master control devices to the associated robotic arm and instrument assemblies and from the arm and instrument assemblies to the associated master control devices in the case of, e.g., force feedback, or the like."). And, given the disclosure of Anderson, we credit Dr. Knodel's testimony that one of ordinary skill in the art would

have understood that "Anderson discloses tactile feedback that would transmit forces from the instrument to the surgeon via the associated master control device." Ex. 1017 ¶¶ 13–15 (citing Ex. 1011, 2:62–3:1, 6:33–37, 16:14–24).

However, we agree with Patent Owner that even if Anderson discloses "tactile feedback," Anderson does not disclose the type of "tactile feedback" that would be necessary to perform passive articulation because it "requires detecting the forces that are applied to the exterior of the end effector." PO Sur-reply 14 (quoting Ex. 2007 ¶ 17 ("Dr. Fegelman explains that passive articulation requires pressing the exterior of the end effector of a surgical tool against another structure.")). And, according to Patent Owner, "Dr. Knodel confirmed at deposition that [Anderson] do[es] not concern tactile feedback for passive articulation." PO Sur-reply 15 (citing Ex. 2025, 26:7–27:2, 33:23–34:9). Patent Owner contends that Dr. Knodel also confirmed at deposition "that the prior art does not disclose this type of tactile feedback in a robotic system." PO Sur-reply 14 (citing Ex. 2025, 34:6–9 ("[A]re you aware of any prior art that describes a system for feedback associated with a passive articulating tool? A. []I'm not aware of that, no.")).

In this context, we find no indication in Anderson that its robotic surgical tool would provide the type of "tactile feedback" necessary to safely articulate Timm's passively articulated joint.[10] *See* Ex. 2007 ¶ 19 ("[P]assive articulation requires nearly instantaneous, tactile feedback to

[10] Timm discloses that "passive articulation" is performed when "[a] clinician positions the tool assembly 100 in the patient and then applies an articulation force to the tool assembly with another surgical instrument or by bringing the tool assembly 100 into contact with a portion of the patient to articulate the tool." Ex. 1011, 32:32–38.

ensure that excessive forces are not applied to the structures. This is particularly true when the exterior of the end effector is being pressed against a structure in the body."); *see also* Ex. 2006 ¶ 74 (citing Ex. 2009, 523, 526, 527) ("It was well-known that robotic systems were incapable of providing haptic feedback concerning the forces that applied to the exterior of the end effector when performing passive articulation."). Relying on its expert, Dr. Knodel, Petitioner argues that Anderson does, in fact, "disclose tactile feedback that would transmit forces from the instrument to the surgeon via the associated master control device." Pet. Reply 12 (citing Ex. 1017 ¶¶ 13–15). However, the cited portions of Dr. Knodel's declaration fail to address whether Anderson's robotic surgical tool would provide "tactile feedback" related to forces "applied to the exterior of the end effector when performing passive articulation." Ex. 2006 ¶ 74. Thus, we are not persuaded that Anderson's robotic surgical tool would provide the type of "tactile feedback" necessary to safely articulate Timm's passively-articulated joint inside a human body. Ex. 2007 ¶ 19; Ex. 2006 ¶ 74.

In addition, Petitioner asserts that one of ordinary skill in the art would have been motivated to combine Anderson and Timm "because a POSITA would not require 'tactile feedback' with a passive articulation joint." Pet. Reply 12. Petitioner explains that Timm discloses that "passive articulation of a joint can be performed in at least two ways: (1) by pressing the end effector against an organ in the body and (2) by having the clinician apply 'an articulation force to the tool assembly **with another surgical instrument**.'" *Id.* (citing PO Resp. 17 (quoting Ex. 1011, 32:32–46)). Consistent with Timm's disclosure, Petitioner takes the position

> a POSITA would have been motivated to use Timm's passive articulation with a robot that lacked tactile feedback with the

> understanding that the surgeon would use another surgical tool to apply the articulation force rather than a sensitive body organ. [Ex. 1017] ¶ 8. This is confirmed by [Patent Owner]'s expert, Dr. Fegelman, who focuses on the first (body) option rather than the second (instrument) option: "this [risk of injury] is particularly true when the exterior of the end effector is **being pressed against a structure in the body**.

Pet. Reply 13 (citing Ex. 2007 ¶ 19) (third alteration in original). We do not agree.

The difficulty with Petitioner's argument is that it appears to be premised primarily on its belief that Dr. Fegelman "focuses on the first (body) option rather than the second (instrument) option." Pet. Reply 13 (citing Ex. 2007 ¶ 19). Yet, as Patent Owner points out, "Dr. Fegelman explained that tactile feedback is necessary 'to prevent damage to *both the surgical tool itself as well as the structure that is providing the articulation force*." PO Sur-reply 16 (quoting Ex. 2007 ¶ 22); *see also* Ex. 2007 ¶ 19 ("Because passive articulation brings the end effector into contact with other structures, passive articulation requires nearly instantaneous, tactile feedback to ensure that excessive forces are not applied to the structures. This is particularly true when the exterior of the end effector is being pressed against a structure in the body."). Thus, Petitioner's argument is not persuasive.

Petitioner also argues that Dr. Knodel testified that "a skilled surgeon can articulate the instrument against a resilient part of the body without tactile feedback." Pet. Reply 13 (citing Ex. 1017 ¶ 11). Petitioner's argument, however, is not persuasive at least because it misrepresents Dr. Knodel's statement at paragraph 11 of his supplemental declaration. In contrast, Dr. Knodel, at the relied upon portion, states

> there is nothing in Timm that defines the force required to actuate the passive articulation joint. A person of ordinary skill in the art would be well capable of designing the passive articulation joint that moves easily in its unlocked state with minimal resistance such that the actuation force would be minimal. Thus the articulation force could be designed to be low enough to easily permit articulation against another instrument, or even against an internal anatomical structure. In fact, there are internal anatomical structure options that are quite robust and many that are delicate. A skilled surgeon could easily choose an appropriate structure to safely articulate the instrument using a low force passive articulation mechanism.

Ex. 1017 ¶ 11. Petitioner's argument also is undermined by Dr. Knodel's earlier admission that "passive articulation against a structure in the body raises concerns of damaging tissue due to excessive force." *Id.* ¶ 7 (emphases omitted). Thus, we afford little weight to Petitioner's reliance on Dr. Knodel's supplemental declaration, at paragraph 11, to establish that "a POSITA would not require 'tactile feedback' with a passive articulation joint." Pet. Reply 12.

Petitioner further argues that "Patent Owner's own patents belie Patent Owner's position that nobody would be motivated to combine passive articulation with a robot." Pet. Reply 13 (citing Ex. 1020). To support its argument, Petitioner asserts, without explaining, that U.S. Patent No. 9,820,768 B2 ("Gee") discloses an "embodiment of a passive articulation mechanism for use with a robotic surgical system and/or manual surgical instrument." Pet. Reply 13 (quoting Ex. 1020, 5:11–13). Petitioner's argument, however, is not persuasive because Gee was filed on June 29, 2012 (*see* Ex. 1020, code (22)), whereas the '969 patent's underlying application has the benefit of priority, as a continuation application, to at

least May 27, 2011 (Ex. 1001, code (63)).[11] Thus, we give little weight to Gee's disclosure regarding "a passive articulation mechanism for use with a robotic surgical system and/or manual surgical instrument" (Ex. 1020, 5:11–13), as it does not reflect the state of the art at the time of the invention.

Alternatively, Petitioner argues that "adding tactile feedback to a robot lacking it would have been obvious in view of general knowledge of the art." Pet. Reply 14. According to Petitioner,

> Patent Owner's expert, Dr. Fegelman, asserts that 'passive articulation requires nearly instantaneous, tactile feedback.' Fegelman Dec., ¶ 19. If this were true, then a POSITA, recognizing this alleged requirement, would have been motivated to add such tactile feedback to the Anderson/Timm system. This is confirmed by at least one of the prior art articles on which Patent Owner relies. Exhibit 2017 is a 2007 article entitled "Haptic Feedback in a Telepresence System for Endoscopic Heart Surgery." In that article, the authors noted that the "lack of haptic feedback may cause damage to tissue" and their solution was simply to build a "telemanipulator for endoscopic surgery that provides . . . **force-feedback** (in order to improve the feeling of immersion)."

Pet. Reply 14 (citing Ex. 1017).

In response, Patent Owner takes the position that "Petitioner's argument that a POSITA would have added tactile feedback to the Anderson/Timm combination is meritless." PO Sur-reply 17 (emphases

[11] In our Decision on Institution, we noted that "Petitioner asserts that May 27, 2011, the day the '969 patent application was filed as a continuation-in-part, is the earliest effective filing date." Dec. on Inst. 7 (citing Pet. 9). We also noted in the Decision on Institution that "Patent Owner asserts that the '969 patent 'claims priority to application No. 11/651,807, which was filed on Jan. 10, 2007,'" but noted that "Patent Owner does not address Petitioner's priority date arguments herein." Dec. on Inst. 7–8 (citing Prelim. Resp. 11)). Neither party has addressed this issue after institution.

omitted). Patent Owner adds "Dr. Knodel provides no testimony concerning this article, and Petitioner's attorney argument is entitled to no weight." *Id.*

We agree with Patent Owner. Petitioner proffers no support from its expert, Dr. Knodel, to support its argument that "if tactile feedback was a requirement, a POSITA would simply add it to the robot." Pet. Reply 14. Here, as Patent Owner points out, "Dr. Knodel admitted at his deposition that he was not aware of any prior art that discloses a system that provides tactile feedback for a passively articulated tool." PO Sur-reply 14 (citing Ex. 2025, 34:6–9). As such, Petitioner's argument is mere attorney argument, which is unsupported by factual evidence. Mere attorney arguments and conclusory statements that are unsupported by factual evidence have little probative value. *In re Geisler*, 116 F.3d 1465, 1470 (Fed. Cir. 1997); *see also In re De Blauwe*, 736 F.2d 699, 705 (Fed. Cir. 1984).

8. Conclusion

For the reasons set forth above, and after conducting a thorough review of the entire record of this case, including the arguments set forth by both parties and the evidence cited in support thereof, we find that Petitioner has failed to demonstrate by a preponderance of the evidence that a person of ordinary skill in the art would have had reason to combine the passive articulation joint disclosed in Timm with the robotic surgical tool system in Anderson.[12] Accordingly, Petitioner has not shown by a preponderance of

[12] Given that Petitioner has not shown, by a preponderance of the evidence, that a person of ordinary skill in the art would have had reason to combine the passive articulation joint disclosed in Timm with the robotic surgical tool system in Anderson (*see* Pet. 36–39), we determine that it is unnecessary to address the parties' arguments related to the Certificate of Correction (*see*

the evidence that claim 24 would have been obvious over Anderson and Timm

E. Ground 3: Claims 25 and 26 – Obviousness over Anderson, Timm, and Wallace

Petitioner contends that claims 25 and 26 would have been obvious over Anderson, Timm, and Wallace. Pet. 57–65.

1. Overview of Wallace (Ex. 1008)

Wallace is titled "Platform Link Wrist Mechanism." Ex. 1008, code (54). Wallace's Abstract reads as follows:

> The present invention provides a robotic surgical tool for use in a robotic surgical system to perform a surgical operation. The robotic surgical tool includes a wrist mechanism disposed near the distal end of a shaft which connects with an end effector. The wrist mechanism includes a distal member configured to support the end effector, and a plurality of rods extending generally along an axial direction within the shaft and movable generally along this axial direction to adjust the orientation of the distal member with respect to the shaft. The distal member has a base to which the rods are rotatably connected by orthogonal linkage assemblies.

Id. at code (57).

2. Discussion of Petitioner's Contentions

Claims 25 and 26 ultimately depend from independent claim 24, and Petitioner's contentions regarding these claims all rely on Petitioner's assertion that the combination of Anderson and Timm renders obvious claim 24. Petitioner does not allege that Wallace cures the deficiency identified

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Ex. 1002, 686), mailed January 23, 2018, as it pertains to a term in independent claim 24 that is distinct from the "articulation joint" limitation. PO Resp. 25–27; Pet. Reply 1–5; PO Sur-reply 1, 3–7.

above in Petitioner's contentions regarding claim 24. *See generally* Pet. 57–65; Pet. Reply 22–24. Accordingly, for the same reasons set forth above with respect to claim 24, Petitioner has failed to demonstrate by a preponderance of the evidence that claims 25 and 26 are rendered obvious by Anderson, Timm and Wallace.

F. Ground 4: Claims 19 and 20 – Obviousness over Anderson and Knodel

Petitioner contends that claims 19 and 20 would have been obvious over Anderson and Knodel. Pet. 65–79.

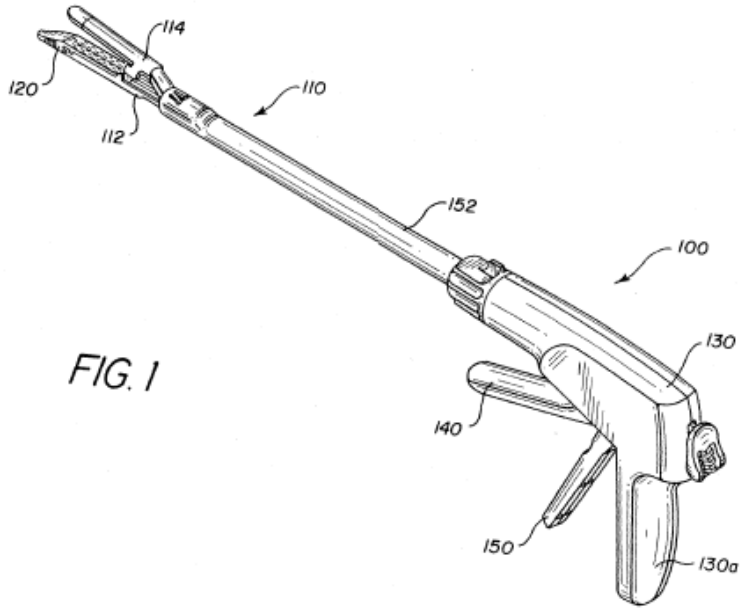
1. Overview of Knodel (Ex. 1012)

Knodel is titled "Surgical Stapler Instrument." Ex. 1012, code (54). Knodel's Abstract reads as follows:

> A surgical stapler instrument is provided for applying lateral lines of staples to tissue while cutting the tissue between those staple lines. The instrument includes a handle portion, an implement portion, a reciprocating section, a drive member and a movable actuator. The implement portion includes a staple cartridge and an anvil. The reciprocating section is adapted to move back and forth along an axis of the implement portion. The movable actuator is associated with the handle portion and is engaged with the drive member such that motion of the actuator causes the drive member to move back and forth between first and second drive positions separated by a first distance. A multiplier is further provided and is associated with the reciprocating section and the drive member for causing the reciprocating section to move back and forth between first and second reciprocating positions in response to movement of the drive member. The reciprocating section includes a work portion which, when moved distally, effects the firing of staples in the staple cartridge toward the anvil. The work portion is also provided with a reciprocating knife. The first and second reciprocating positions are separated by a second distance which differs from the first distance.

Id. at code (57).

Figure 1 of Knodel is reproduced below.



Knodel's Figure 1 depicts a perspective view of a surgical stapler instrument. *Id.* at 4:43–44. Figure 1 illustrates stapler instrument 100, which includes implement portion 110 having elongated channel 112 and anvil 114, handle portion 130, firing trigger 140, and closure trigger 150. *Id.* at 5:54–65. Figure 2 of Knodel is reproduced below.

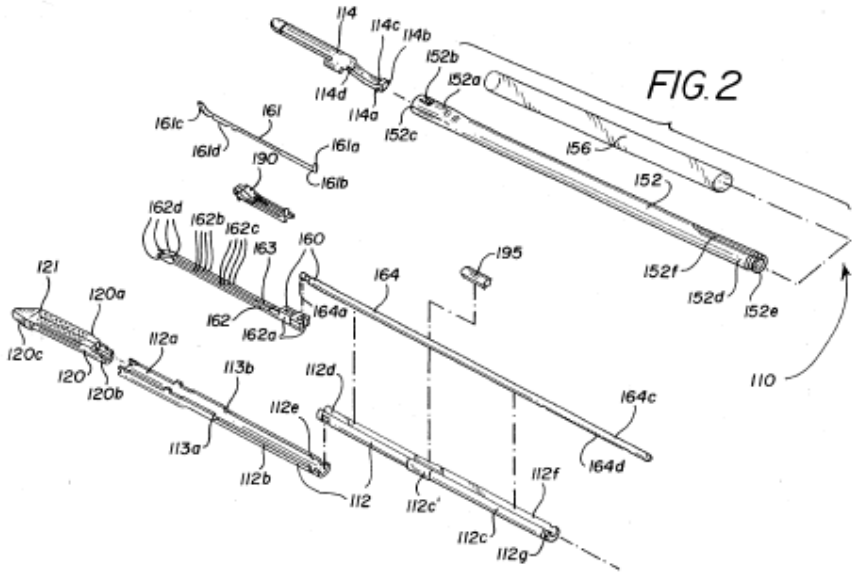


Figure 2 depicts an exploded view of an implement portion of Knodel's surgical stapler instrument. *Id.* at 4:45–46. Figure 2 illustrates elongated channel 112 comprised of first and second channel sections 112b and 112c, knife 161, and reciprocating section 160, which comprises wedge work member 162 and metal drive member 164. *Id.* at 6:56–57, 9:12–13. Knodel discloses that "[d]istal movement of the wedge work member 162 also effects distal movement of the knife 161 such that severing of the tissue 200 occurs." *Id.* at 12:1–3.

2. Discussion

Petitioner contends that claims 19 and 20 of the '969 patent would have been obvious in view of the combined teachings of Anderson and Knodel. Pet. 65–79. We have reviewed the Petition, Patent Owner Response, Petitioner Reply, Patent Owner Sur-reply, as well as the relevant evidence discussed in those papers and other record papers, and as discussed in greater detail below, we are persuaded that the record establishes by a preponderance of the evidence that claims 19 and 20 would have been obvious over Anderson and Knodel, as Petitioner contends. We adopt Petitioner's contentions discussed below as our own.

3. Petitioner's Contentions

Petitioner asserts that the combination of Anderson and Knodel discloses the preamble of independent claim 19 for the same reasons discussed above with respect to independent claim 24. *See* Pet. 68; *cf. id.* at 13–15, 32.

Independent claim 19 recites first "a surgical end effector comprising: a surgical staple cartridge; and a cutting instrument that is axially movable within said surgical staple cartridge between a starting position and an

ending position in response to control motions applied thereto." Petitioner asserts that Knodel discloses a surgical stapler including a stapler cartridge. Pet. 69 (citing Ex. 1012, 5:52–65; Ex. 1004 ¶ 135). Petitioner explains that Anderson notes that its robotically operated surgical instrument may be "configured to actuate a wide variety of end effectors, including surgical staplers." Pet. 69 (citing Ex. 1010, 7:6–25). Petitioner further asserts that Knodel discloses that wedge 162 moves from a first position to a second position in response to "movement of the firing trigger." Pet. 69 (citing Ex. 1012, 10:10–18, 10:49–11:12, 12:1–6; Ex. 1004 ¶ 137). Petitioner explains that a POSITA would have been motivated "to modify Anderson to include the gear-driven knife bar and surgical stapler assembly of Knodel" for several reasons. Pet. 70–71 (citing Ex. 1010, 7:19–25; Ex. 1012, 1:53–67, 5:52–6:10, 9:10–17, 10:65–11:12, 10:10–18; Ex. 1004 ¶¶ 131–133).

Independent claim 19 next recites "an elongated shaft assembly operably coupled to said surgical end effector, said elongated shaft assembly comprising at least one gear-driven portion comprising a knife bar that is movably supported within said elongated shaft assembly for selective axial travel therein, said knife bar interfacing with said cutting instrument." Ex. 1001, 93:38–43. Petitioner asserts that Anderson and Knodel both disclose surgical instruments including elongated shaft assemblies and surgical end effectors. Pet. 71–72 (citing Ex. 1010, 11:43–65, Fig. 2; Ex. 1012, 5:52–6:10, Fig. 1; Ex. 1004 ¶ 139). Petitioner further asserts that Knodel's knife bar, i.e., "metal drive member 164," is movably supported within its shaft and in meshing contact with multiplier gear 170. Pet. 72–73 (citing Ex. 1012, 9:10–35, 10:65–11:12, 10:10–18, Figs. 2, 6).

Independent claim 19 further recites "a tool mounting portion

operably coupled to said elongated shaft assembly, said tool mounting portion being configured to operably interface with the tool drive assembly when coupled thereto." Ex. 1001, 93:44–47. Petitioner asserts that Anderson discloses the aforementioned limitation. Pet. 74–75 (citing Ex. 1010, 22:8–33, 22:59–67, 18:20–24, 11:66–12:22, Figs. 1, 3, 20; Ex. 1004 ¶ 143). Petitioner explains that

> a POSITA would have understood that modifying Anderson to include the surgical stapler end effector and knife bar ("drive member 164") of Knodel would have included using one of Anderson's "transmission members 70, 72, 74, and 76" having "shafts 70.1, 72.1, 74.1, and 76.1" and/or "instrument actuator interface member 353a and 353b" to provide rotational motion to the gear assembly that drives Knodel's drive member 164.

Pet. 74–75 (citing Ex. 1010, 11:66–12:22, 22:59–23:30, 24:23–39, Figs. 3, 21, 22; Ex. 1004 ¶ 143).

Independent claim 19 still further recites "a driven element rotatably supported on said tool mounting portion and configured for driving engagement with a corresponding one of the at least one rotatable body portions of the tool drive assembly to receive corresponding rotary output motions therefrom." Ex. 1001, 93:49–53. Petitioner asserts that Anderson discloses the aforementioned limitation. Pet. 75 (citing Ex. 1010, 11:66–12:22, 22:59–23:30, 24:23–39, Figs. 3, 21, 22; Ex. 1004 ¶ 144).

Independent claim 19 last recites "a transmission assembly in operable engagement with said driven element and in meshing engagement with the knife bar to apply actuation motions thereto to cause said knife bar to apply at least one control motion thereto." Ex. 1001, 93:54–58. Petitioner asserts that Anderson discloses that movement of its end effector is caused by actuators that rotate transmission members 70, 72, 74, and 76.

Pet. 75–76 (citing Ex. 1010, 11:59–12:22, 22:59–23:30, 24:23–65, Figs. 3, 21, 22). Petitioner explains that "the transmission assembly of the resulting combination (e.g., the gear assembly of Knodel in communication with Anderson's transmission members) is in operable engagement with said driven element (one or more of Anderson's shafts) to receive actuation motions." Pet. 76 (citing Ex. 1004 ¶ 146).

We have reviewed Petitioner's arguments and the underlying evidence cited in support and are persuaded that Petitioner sufficiently establishes that one of ordinary skill in the art

> would have recognized that Anderson contemplates use of its robotic surgical system with "stapler probes" and Knodel provides details on a "surgical stapler" type end effector, the gear assembly for actuating the surgical stapler, and the knife bar configuration for transferring the activation motion from the gear assembly to the surgical stapler type end effector.

Pet. 70 (citing Ex. 1010, 7:19–25; Ex. 1012, 5:52–6:10, 9:10–17, 10:65–11:12, 10:10–18; Ex 1004 ¶ 131). In addition, Petitioner reasons, and we agree, that "[a] POSITA would have recognized that Anderson discloses just such a surgical system that could be readily improved by Knodel's 'improved motion transfer mechanism.'" Pet. 70 (citing Ex. 1012, 1:53–67; Ex. 1004 ¶ 132).

Petitioner provides similar detailed analysis, supported by the testimony of Dr. Knodel, for claim 20. *See* Pet. 77–79 (citing Ex. 1004 ¶¶ 147–150). Notwithstanding Patent Owner's arguments, which we have considered and which we address below, we are persuaded by Petitioner's arguments and evidence, discussed above, which we adopt as our own findings and conclusions, and we determine that Petitioner establishes by a preponderance of the evidence that claims 19 and 20 are unpatentable as

obvious over the combined teachings of Anderson and Knodel.

4. Patent Owner's Contentions

Patent Owner contends that Petitioner's ground of unpatentability based on Anderson and Knodel is deficient. PO Resp. 5, 46–49; PO Sur-reply 25–26. More particularly, Patent Owner argues that one of ordinary skill in the art would not have been motivated to combine the teachings of Anderson and Knodel because (i) the proposed combination "would result in a loss of tactile feedback for clamping" (PO Resp. 47) and (ii) "a POSITA would have lacked a reasonable expectation of success in combining" Anderson's harmonic tool base with Knodel's manually actuated handheld endocutter. PO Resp. 48–49. We address each argument in turn.[13]

5. Analysis

i. "tactile feedback"

Patent Owner asserts that a person of ordinary skill in the art would have been deterred from combining Knodel's handheld endocutter with Anderson's robotic surgical tool because "[a] POSITA would have known that tactile feedback is critical to the operation of an endocutter such as Knodel during the clamping and firing process." PO Resp. 46 (citing Ex. 2006 ¶¶ 103–107); Ex. 2015, 3:1–3:14; Ex. 2016, 7:1–3; Ex. 2017, 460; Ex. 2018, 102; PO Sur-reply 25. Consequently, Patent Owner argues,

> [g]iven that the advantages associated with tactile feedback were known to be critical to the user of an endocutter such as Knodel, and robotic systems such as Anderson lacked tactile feedback on clamping, a POSITA would not have been motivated to combine

[13] Patent Owner presents no specific argument or evidence directed to claim 20. *See generally* PO Resp.

Anderson with Knodel as proposed by Petitioner.

PO Resp. 48 (citing Ex. 2006 ¶ 107). We are not persuaded by Patent Owner's argument.

Instead, we agree with Petitioner that Anderson's robotic surgical tool system "discloses tactile feedback that would transmit forces from the instrument to the surgeon via the associated master control device." Pet. Reply 12 (citing Ex. 1017 ¶¶ 13–15). Here, as discussed above, we credit Dr. Knodel's testimony that one of ordinary skill in the art would have understood that "Anderson discloses tactile feedback that would transmit forces from the instrument to the surgeon via the associated master control device." Ex. 1017 ¶¶ 13–15 (citing Ex. 1011, 2:62–3:1, 6:33–37, 16:14–24).

Anderson discloses that its robotic surgical tool provides a surgeon with "tactile feedback" using "one or more electrical motors, transmission gearing, position encoders, torque sensors, feedback sensors, and the like, and may transmit feedback or sensor signals to the robotic surgical system via the interface." Ex. 1010, 6:32–36; *see also id.* at 2:63–3:1 ("The control system typically includes at least one processor which relays input commands from the master control devices to the associated robotic arm and instrument assemblies and from the arm and instrument assemblies to the associated master control devices in the case of, e.g., force feedback, or the like."); *cf.* Ex. 2025, 43:5–9 (Dr. Knodel stating "I think that feedback -- force feedback -- getting feedback from a motor, whether you're sensing torque and turning that into an impulse on your hand, I do not think that that is technically beyond what a POSITA could do."). Thus, Patent Owner's argument that a person of ordinary skill in the art would have been deterred from combining Knodel and Anderson because "[a] POSITA would have

known that tactile feedback is critical" to the "clamping and firing process" is not persuasive at least because Anderson discloses "tactile feedback."[14]

ii. reasonable expectation of success

Patent Owner asserts that Petitioner fails to demonstrate that one of ordinary skill in the art would have been motivated to combine the teachings of Anderson and Knodel with a reasonable expectation of success. PO Resp. 48–49 (citing *id.* at 33–37); PO Sur-Reply 26. Patent Owner first argues that "a POSITA would not have had a reasonable expectation of success in combining Anderson's tool base with [Knodel's] endocutter" because "Anderson's tool base is designed to control a harmonic end effector, which is fundamentally different from an endocutter" (PO Resp. 33–34 (citing Ex. 2006 ¶¶ 79–81). More particularly, Patent Owner argues that "harmonic devices are incapable of articulation because the ultrasound probe tip must be vibrated at a high frequency in order to impart sufficient energy onto tissue in order cut and/or coagulate it." PO Resp. 34 (citing Ex. 2006 ¶ 79).

In response, Petitioner points out that "even though the focus of Anderson's preferred embodiments may be harmonic tools, Anderson's transmission members can drive any tool requiring rotary controls." Pet. Reply 18 (citing Ex. 1004 ¶¶ 64–75; Pet. 1, 18–29, 69, 80). Petitioner explains that "Anderson specifically discloses non-harmonic tools and also

[14] Unlike independent claim 24 (Ground 2), independent claim 19 does not recite an "articulation joint" limitation, and as such, Patent Owner's arguments directed to the type of "tactile feedback" necessary for "passive articulation" are not relevant to our analysis regarding independent claim 19. *See* Pet. Reply 24 ("For Ground 2, Patent Owner argued that tactile feedback was 'critical' to passive articulation. For this Ground, Patent Owner ups the ante and argues that tactile feedback is "critical" to any robotic linear stapler/cutter (which it calls an 'endocutter.')")

discloses articulating surgical instruments." Pet. Reply 18 (citing Ex. 1010, 6:47–58; Pet. 1, 38). We agree with Petitioner.

In this regard, Anderson discloses that its "instrument probe assembly may include at least one distal joint to controllably orient the distal probe end relative to the probe axis, such as a wrist-like rotational or pivotal joint supporting a distal end effector." Ex. 1010, 6:50–54. In light of Anderson's express disclosure suggesting the use of "a wrist-like rotational or pivotal joint" (*id.*), we are not persuaded by Patent Owner's argument that "harmonic devices are incapable of articulation," and as such, we are not persuaded that "a POSITA would have lacked a reasonable expectation of success in combining Anderson with Knodel" (PO Resp. 34, 49).

Patent Owner next asserts that Knodel's manually actuated handheld endocutter and Anderson's harmonic tool base operate on a fundamentally different principle, and as such, "a person of ordinary skill in the art would have encountered substantial challenges in attempting to adapt [Knodel's] endocutter for use with Anderson's robotic system." PO Resp. 35 (citing Ex. 2006 ¶¶ 82–85). However, we agree with Petitioner that one of ordinary skill in the art would have readily understood how "the handheld gear-driven linear stapler of Knodel is modified to adapt to the Anderson system" at least "because it merely involves the coupling of rotary drives to rotary inputs, using, e.g., gears." Pet. Reply 25 (citing Pet. 75–76); *see also* Pet. Reply 19 (citing Ex. 1004 ¶¶ 92–103) ("Dr. Knodel has testified that a POSITA would easily make the necessary adjustments to couple the rotary output of Anderson."). We also credit Dr. Knodel's statement that

> one of ordinary skill in the art would have understood that modifying Anderson to include the surgical stapler end effector and knife bar ("drive member 164") of Knodel would have

> included using one of Anderson's "transmission members 70, 72, 74, and 76" having "shafts 70.1, 72.1, 74.1, and 76.1" and/or "instrument actuator interface member 353a and 353b" to provide rotational motion to the gear assembly that drives Knodel's drive member 164.

Ex. 1004 ¶ 142 (citing Ex. 1010, 11:66–12:22, 22:59–23:30, 24:23–39, Figs. 3, 21–22).

Patent Owner asserts that another substantial challenge would exist to one of ordinary skill in the art "[g]iven the differences in how force is generated and transferred in robotic systems relative to handheld systems," and as such, "a POSITA would not have had a reasonable expectation of success in adapting [Knodel] for use with Anderson's robotic system." PO Resp. 36 (citing Ex. 2006 ¶¶ 82–85). However, we agree with Petitioner that "using gears to convert motor power to a lower speed and higher torque is well within a POSITA's skill." Pet. Reply 19 (citing Ex. 1023, 27:8–31:14; Ex. 1019, 116:8–119:1). In this regard, we are persuaded that Petitioner sufficiently establishes that one of ordinary skill in the art would have recognized that the rotary outputs in Anderson's robotic system could be readily coupled to the rotary inputs in the endocutter disclosed by Knodel because one of ordinary skill in the art would understand that "it merely involves the coupling of rotary drives to rotary inputs, using, e.g., gears." Pet. 25; *see also* Ex. 1004 ¶ 142. Thus, we are not persuaded by Patent Owner's argument that "a POSITA would not have had a reasonable expectation of success in adapting [Knodel] for use with Anderson's robotic system" given the differences in how forces are generated in Anderson and Knodel.

6. Conclusion

We have considered the entirety of the evidence submitted by the parties, and determine that Petitioner has shown, by a preponderance of the evidence, that claims 19 and 20 of the '969 patent would have been obvious to one of ordinary skill in the art over the combined teachings of Anderson and Knodel.

G. Ground 5: Claims 21 and 22 – Obviousness over Anderson and Viola

Petitioner contends that claims 21 and 22 would have been obvious over Anderson and Viola. Pet. 79–92.

1. Viola (Ex. 1013)

Viola is titled "Self-Contained Powered Surgical Apparatus for Applying Surgical Fasteners." Ex. 1013, code (54). Viola's Abstract reads as follows:

> A self-contained powered surgical apparatus for applying surgical fasteners to body tissue is disclosed which includes a handle assembly, a gear motor assembly disposed within the handle assembly, a power source disposed within the handle assembly for energizing the motor assembly, an elongated body extending distally from the handle assembly, a cartridge assembly detachably connected to a distal end portion of the elongated body, and an elongated drive shaft extending through the elongated body and detachably coupling the motor assembly to the cartridge assembly.

Id. at code (57). Figure 1 of Viola is reproduced below.

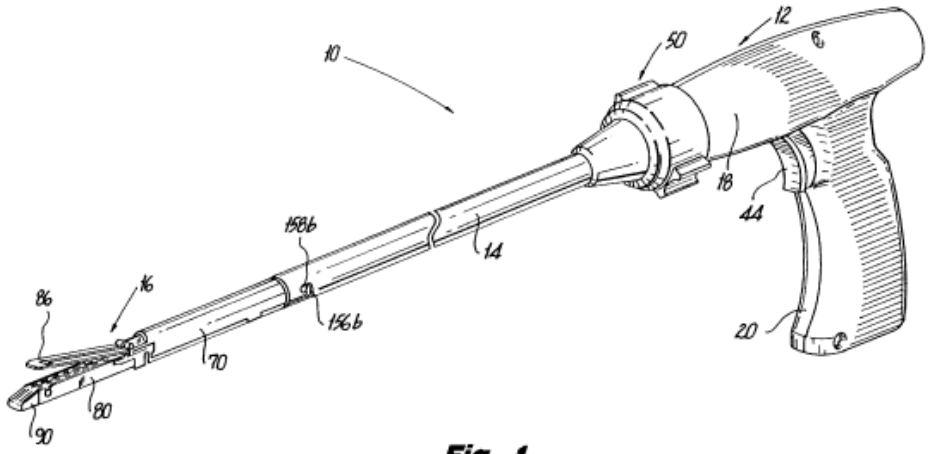


Fig. 1

Figure 1 depicts a perspective view of a powered surgical stapler. *Id.* at 3:14–16. Figure 1 illustrates surgical stapler 10, which includes handle portion 12, elongate body portion 14, and cartridge assembly 16 detachably connected to a distal end of body portion 14. *Id.* at 4:10–17.

Figure 2 of Viola is reproduced below.

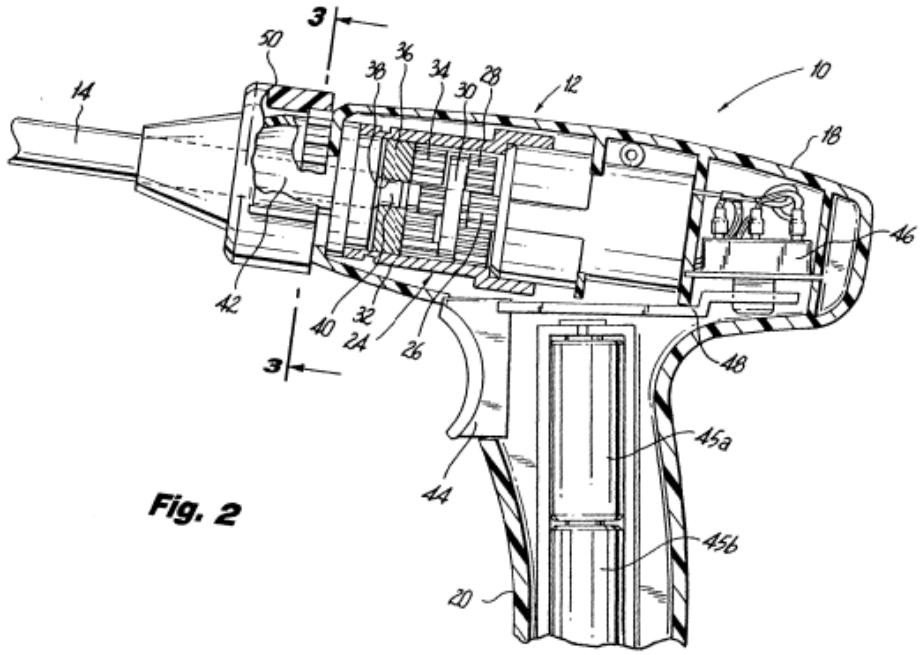


Fig. 2

Figure 2 depicts a side elevational view in cross-section of the handle assembly of Viola's powered surgical stapler. *Id.* at 3:17–19. Figure 2 illustrates:

> motor assembly 22 having an output shaft (not shown) is disposed within the barrel section 18 and includes a gear set 24 for reducing the rotational speed of the output shaft and increasing the torque delivered by the motor assembly. Gear set 24 includes a pinion gear 26 which is directly driven by the output shaft of motor assembly 22.

Id. at 4:18–26. Figure 5 of Viola is depicted below.

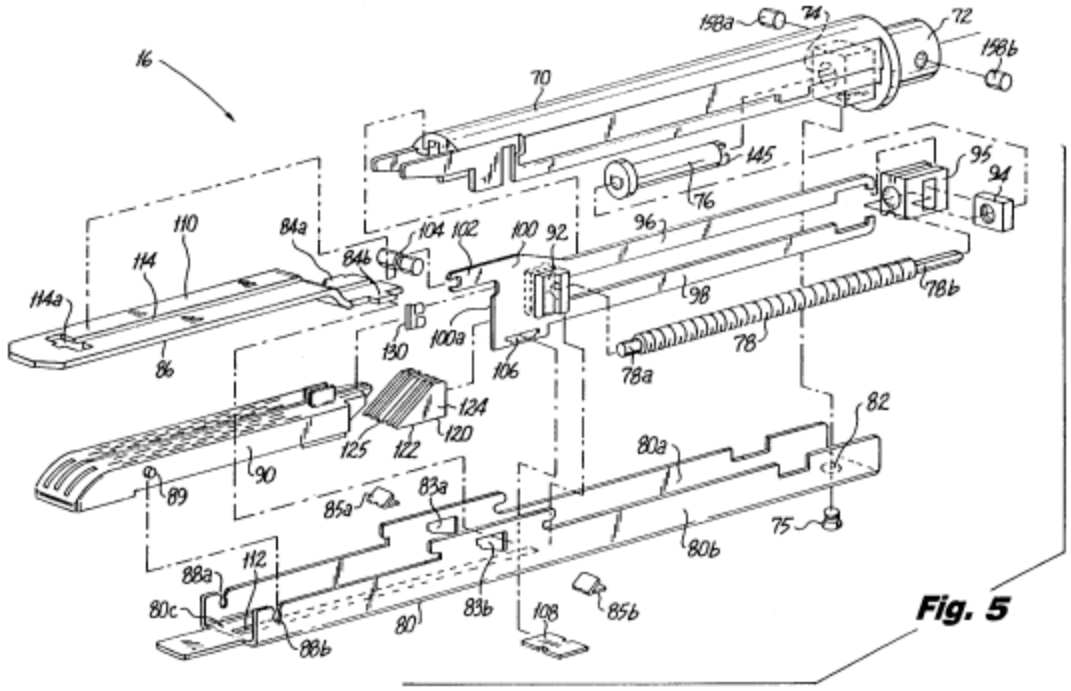


Fig. 5

Figure 5 depicts an exploded perspective view of cartridge assembly 16 of Viola's powered surgical stapler. *Id.* at 3:33–34. Figure 5 illustrates that "[c]artridge assembly 16 includes two main structural portions, a cartridge adaptor 70 and an elongated housing channel 80." *Id.* at 5:55–58. Viola discloses:

> Adapter 70 includes a mounting portion 72 at its proximal end dimensioned for reception within the distal end of elongated body portion 14. An axial bore 74 extends through mounting portion 72 for rotatably supporting a cylindrical cartridge coupling 76. Cartridge coupling 76 is configured to connect at its distal end to the proximal end of an axial drive screw 78. Coupling 76 is detachably connected at its proximal end to a shaft coupling 140 which is connected to the distal end of drive shaft 42. This coupling . . . transmits rotational motion from the drive shaft 42 to the drive screw 78.

Id. at 5:59–6:2. More particularly, Viola discloses, "Actuation beam 100 is driven by the axial drive screw 78 which, as noted above, is driven by drive shaft 42. An actuation sled 120 is configured to translate through fastener retainer cartridge 90 to effectuate the ejection of surgical fasteners therefrom." *Id.* at 6:26–32.

2. Discussion

Petitioner contends that claims 21 and 22 of the '969 patent would have been obvious in view of the combined teachings of Anderson and Viola. Pet. 79–92. We have reviewed the Petition, Patent Owner Response, Petitioner Reply, Patent Owner Sur-reply, as well as the relevant evidence discussed in those papers and other record papers, and as discussed in greater detail below, we determine that Petitioner has failed to make the requisite showing to support its contention that claims 21 and 22 of the '969 patent would have been obvious in view of the combined teachings of Anderson and Viola.

3. Petitioner's Contentions

Petitioner contends that claims 21 and 22 of the '969 patent would have been obvious in view of the combined teachings of Anderson and Viola. Petitioner provides a detailed assessment of the content of the prior

art in advocating that all the features of claims 21 and 22 are shown therein. *See* Pet. 79–92.

Petitioner asserts that the combination of Anderson and Viola discloses the preamble of independent claim 21 for the same reasons discussed above with respect to independent claim 24. Pet. 79–80 (citing Ex. 1010, 10:65–11:42, 4:7–11, code (57), 10:21–64, 11:59–12:22, 5:61–6:8, Figs. 1–3; Ex. 1004 ¶ 157). Petitioner explains that a POSITA would have had multiple reasons to modify Anderson's robotic surgical system to include the drive-screw-driven surgical stapler assembly of Viola. Pet. 81–82 (citing Ex. 1010, 7:19–25; Ex. 1013, 2:1–20, 4:5–25, 5:44–58, 6:3–59; Ex. 1004 ¶¶ 154–156). For example, Petitioner asserts that "a POSITA would have recognized that Anderson contemplates use of its robotic surgical system with 'stapler probes,' and Viola provides details on a 'surgical stapler,'" and as such, one of ordinary skill in the art "would have turned to Viola for details on how to implement Anderson's surgical system with a surgical stapler end effector to increase the number of uses for Anderson's system." Pet. 81 (citing Ex. 1010, 7:19–25; Ex. 1013, 4:5–17, 5:44–58, 6:3–59; Ex. 1004 ¶ 154).

Petitioner also explains how Anderson and Viola account for each of: (1) "a surgical end effector comprising: an elongated channel configured to support a surgical staple cartridge therein" (Pet. 80–81 (citing Ex. 1010, 7:6–25; Ex. 1013, 4:5–17, 5:44–58, 6:3–32, Fig. 5; Ex. 1004 ¶ 158)); (2) "a rotary end effector drive shaft operably supported within an elongated channel" (Pet. 82–83 (citing Ex. 1013, 5:55–6:50, Fig. 5; Ex. 1004 ¶ 160)); (3) "a knife member having a tissue-cutting portion thereon threadedly received on said rotary end effector drive shaft such that rotation of said

rotary end effector drive shaft in a first[/second] direction causes said knife member to move in a distal[/proximal] direction through said surgical staple cartridge" (Pet. 83–86 (citing Ex. 1013, 2:50–54, 5:9–12, 6:37–59, 7:65–8:5, 16:52–61, 17:51–54, 22:59–23:14, 24:40–53, Figs. 9–10, 13, 21; Ex. 1004 ¶¶ 164–165)); (4) "an elongated shaft assembly operably coupled to said elongated channel, said elongated shaft assembly comprising at least one gear-driven portion that is in operable communication with said rotary end effector drive shaft" (Pet. 86–88 (citing Ex. 1013, 4:10–39, 5:44–58, 7:56–65, Figs. 1–2; Ex. 1004 ¶ 166)); (5) "a tool mounting portion operably coupled to said elongated shaft assembly, said tool mounting portion being configured to operably interface with the tool drive assembly when coupled thereto" (Pet. 88–89 (citing Ex. 1010, 2:8–33, 22:59–67, 18:20–24, 11:66–12:22, Figs. 1, 3, 20; Ex. 1004 ¶ 169)); (6) "driven element rotatably supported on said tool mounting portion and configured for driving engagement with a corresponding one of the at least one rotatable body portions of the tool drive assembly to receive corresponding rotary output motions therefrom" (Pet. 89 (citing Ex. 1010, 11:66–12:22, 22:59–23:30, 24:23–39, Figs. 3, 21–22; Ex. 1004 ¶ 170)); and, finally, (7) "a transmission assembly in operable engagement with said driven element and in meshing engagement with a corresponding one of said at least one gear-driven portions to apply actuation motions thereto to cause said corresponding one of said at least one gear-driven portions to apply at least one control motion to said rotary end effector drive shaft" (Pet. 89–90 (citing Ex. 1010, 11:66–12:22, 22:59–23:30, 24:23–39, Figs. 3, 21–22; Ex. 1013, 4:18–39, 5:56–6:2, 7:56–65, Fig. 2; Ex. 1004 ¶¶ 171–172)).

In connection with the requirement noted above of "a knife member having a tissue-cutting portion thereon threadedly received on said rotary end effector drive shaft such that rotation of said rotary end effector drive shaft causes said knife member to move [in a distal or proximal direction]," Petitioner further asserts that "Viola discloses a knife member in the form of a cutting blade on an actuation beam 100 that is threadedly coupled to the drive screw 78 (e.g., the rotary end effector drive shaft) by a follower nut." Pet. 83–84 (citing Ex. 1013, 6:37–59, Figs. 9, 10; Ex. 1004 ¶ 161). Petitioner also asserts that when Viola's drive screw 78 is rotated in a first direction, it causes "actuation beam 100 [to] translate[] distally with the follower housing." Pet. 84 (citing Ex. 1013, 6:55–59, 7:65–8:5, Figs. 9, 10). Petitioner further asserts that Viola discloses reversing the direction of its motor and drive shaft, and thus, discloses that its drive screw rotates in both directions such that the knife moves distally and proximally. Pet. 85 (citing Ex. 1013, 7:56–65, 2:50–54, 5:9–12, Figs. 9, 10; Ex. 1003 ¶ 164). Petitioner explains that "a POSITA would have recognized that Anderson's rotary drive members support rotation in either direction: 'generally . . . actuator motion is reversible and controllable by the robotic system, producing a controllable forward or rearward actuator.'" Pet. 85 (citing Ex. 1010, 17:51–54; Ex. 1004 ¶ 165) (emphasis omitted).

Petitioner provides similar detailed analysis, supported by the testimony of Dr. Knodel, for claim 22. Pet. 90–92 (citing Ex. 1010, 4:18–39, 11:66–12:22, 22:59–23:30, 24:23–39, Figs. 3, 21–22; Ex. 1013, 4:34–39, 5:65–6:2, 6:45–52, 7:14–20; Ex. 1004 ¶¶ 172–175).

4. Patent Owner's Contentions

Patent Owner contends that Petitioner's ground of unpatentability based on Anderson and Viola is deficient. PO Resp. 5, 49–53; PO Sur-reply 26. More particularly, Patent Owner argues that the teachings of Anderson and Viola fail to disclose, *inter alia*, "a knife member having a tissue-cutting portion thereon threadedly received on said rotary drive shaft," as required by independent claim 21. PO Resp. 5; *see also id.* at 49–53; PO Sur-reply 26.

5. Analysis

Patent Owner argues that "Viola fails to disclose a knife member threadedly engaged on the drive shaft as required by claim 21." PO Resp. 51–52 (citing Ex. 2006 ¶ 115). Patent Owner provides the following reproduction of Figure 5 of Viola, annotated to identify, among several items, drive screw 78, follower housing 95, and actuation beam 100. PO Resp. 52.

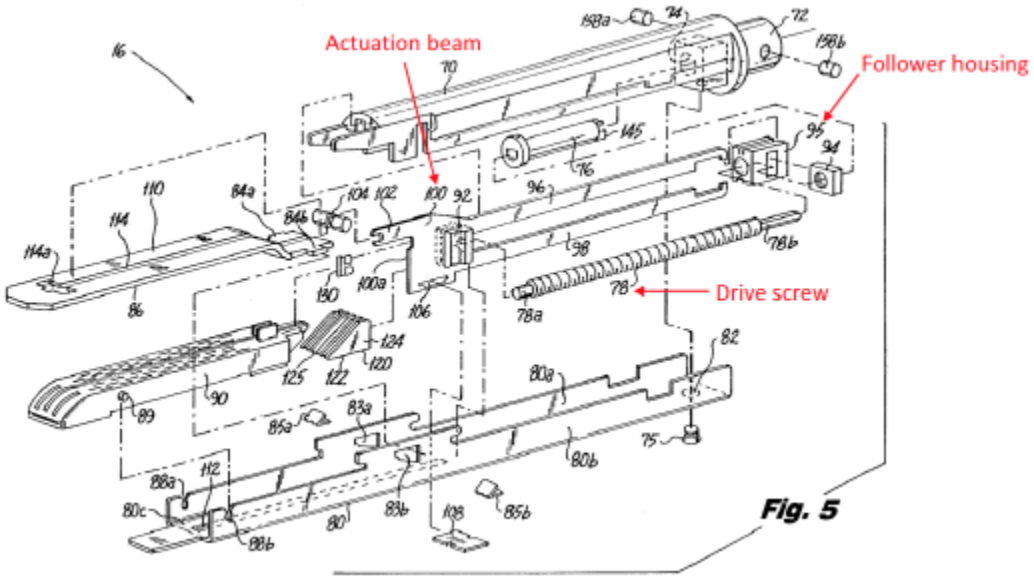


Figure 5 depicts an exploded perspective view of cartridge assembly 16 of Viola's powered surgical stapler (Ex. 1013, 3:33–34), and is annotated by Patent Owner, to identify drive screw 78, follower housing 95, and actuation beam 100. Patent Owner asserts that Viola does not disclose that its knife member is "threadedly engaged on the drive shaft"; but rather,

> Viola discloses that the rotary drive screw is threadedly engaged with a follower nut mounted in follower housing 95. Ex. 1013, 6:50–55 ("A follower nut 94 is threadably associated with drive screw 78 and is mounted within a follower housing 95. Follower housing 95 is mounted in such a manner so as to translate in a longitudinal direction in response to axial rotation of drive screw 78.").

PO Resp. 52. Patent Owner explains that Viola's configuration "is distinct from the claimed and disclosed embodiment in the 969 Patent of a knife member threadedly engaged on the rotary drive shaft." *Id.* To support its position, Patent Owner provides the following reproduction of Figures 107 and 108 of the '969 patent:

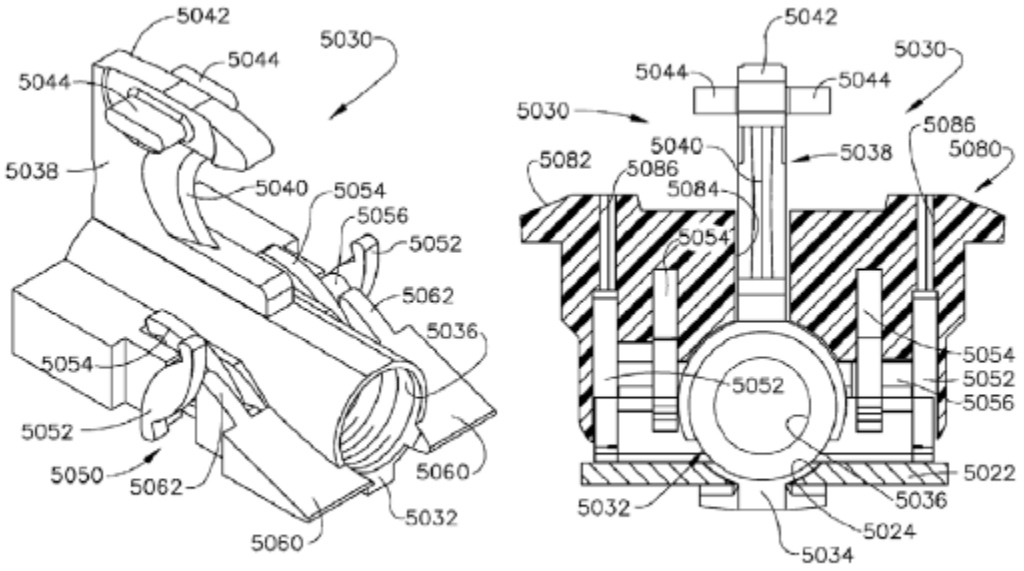


FIG. 107 FIG. 108

Figure 107 is "a perspective view of a sled assembly embodiment" of

the present invention. Ex. 1001, 8:51–53. Figure 108 "is a cross-sectional view of the sled assembly embodiment of FIG. 107." *Id.* at 8:54–56. With reference to Figure 107 and Figure 108, Patent Owner argues that the figures "show the knife member threadedly engaged with the rotary end effector drive shaft." PO Resp. 52–53 (citing Ex. 2006 ¶¶ 115–117); PO Sur-reply 26.

In response, Petitioner asserts that "Patent Owner arbitrarily excludes Viola's 'follower nut 94' from the 'knife member' and argues that the 'knife member' lacks a threaded engagement." Pet. Reply 27. Petitioner explains that "[t]he Petition properly maps the entire knife structure, including the follower nut, to the claimed 'knife member,' given that the entire structure moves as one." *Id.* (citing Pet. 83–85). Petitioner's argument is not persuasive.

In making this determination, we note that independent claim 21 recites "a knife member . . . threadedly received on said rotary end effector drive shaft." Ex. 1001, 94:17–19. Thus, claim 21 requires that the "knife member" be "threadedly received on said rotary end effector drive shaft." *Id.* (emphasis added). However, Petitioner's expert, Dr. Knodel, states:

> As to the phrase "a knife member having a tissue-cutting portion thereon threadedly received on said rotary end effector drive shaft," Viola teaches a cutting blade (i.e., knife member) that is operatively coupled to "axial drive screw 78" (i.e., rotary end effector drive shaft) by follower nut 94 within housing 95.

Ex. 1004 ¶ 161 (emphasis added). Thus, we agree with Patent Owner that "[u]nlike the knife member described and claimed in the 969 Patent, Viola's follower nut/knife are separate components. Only the follower nut is threadedly received on Viola's alleged 'rotary end effector drive shaft.'" PO Sur-reply 26; *see also* Ex. 2006 ¶ 117 (Dr. Awtar stating "it is my opinion

that Viola does not disclose 'a knife member having a tissue-cutting portion thereon threadedly received on said rotary drive shaft.'"). Petitioner proffers no support from its expert, Dr. Knodel, to rebut Dr. Awtar's opinion.

6. Conclusion

For the reasons set forth above, and after conducting a thorough review of the entire record of this case, including the arguments set forth by both parties and the evidence cited in support thereof, we find that Petitioner has failed to demonstrate by a preponderance of the evidence that the teachings of Anderson and Viola disclose "a knife member . . . threadedly received on said rotary end effector drive shaft," as recited by independent claim 21.[15] Accordingly, Petitioner has failed to demonstrate by a preponderance of the evidence that claims 21 and 22 are rendered obvious by Anderson and Viola.

IV. CONCLUSION[16]

For the foregoing reasons, we determine the following:

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[15] Petitioner does not rely on, or allege that, Anderson cures the deficiency identified above in Petitioner's contentions regarding claim 21. *See* Pet. 83–84; Pet. Reply 27.

[16] 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).

Claims	35 U.S.C. §	References	Claims Shown Unpatentable	Claims Not Shown Unpatentable
24	§ 103	Anderson, Timm		24
25, 26	§ 103	Anderson, Timm, Wallace		25, 26
19, 20	§ 103	Anderson, Knodel	19, 20	
21, 22	§ 103	Anderson, Viola		21, 22
Overall Outcome			19, 20	21, 22, 24–26

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Petitioner has shown by a preponderance of the evidence that claims 19 and 20 of the ’969 patent are unpatentable;

FURTHER ORDERED that Petitioner has not shown by a preponderance of the evidence that claims 21, 22, and 24–26 of the ’969 patent are unpatentable; and

FURTHER ORDERED that, because this is a Final Written Decision, parties to the 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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