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Paper 7
January 15, 2019

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INTUITIVE SURGICAL, INC.,
Petitioner,

v.

ETHICON LLC,
Patent Owner.

Case 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*.

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

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. We have authority under 35 U.S.C. § 314(a), which provides that an *inter partes* review may not be instituted "unless . . . the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." Moreover, a decision to institute under 35 U.S.C. § 314 may not institute on fewer than all claims challenged in the petition. *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018).

Upon consideration of the Petition and the Preliminary Response, we conclude that the information presented shows there is a reasonable likelihood that Petitioner would prevail in showing the unpatentability of at least one challenged claim. Accordingly, we authorize an *inter partes* review to be instituted as to claims 19–22 and 24–26 of the '969 patent on the grounds raised in the Petition.[1] Our factual findings and conclusions at this stage of the proceeding are based on the evidentiary record developed thus far (prior to Patent Owner's Response). This is not a final decision as to patentability of claims for which *inter partes* review is instituted. Any final decision will be based on the record, as fully developed during trial.

[1] Although the Petitioner initially sought to challenge claim 23 of the '969 patent, Patent Owner has statutorily disclaimed that claim. *See* Ex. 2002. For the reasons discussed *infra*, claim 23 is no longer regarded as a claim challenged in the Petition.

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, and claims priority, as a continuation-in-part, to an application filed January 10, 2007. Ex. 1001, [45], [22], [63]. The '969 patent is titled "Drive Interface for Operably Coupling a Manipulatable Surgical Tool to a Robot," and generally relates to endoscopic surgical instruments. Ex. 1001, [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." Ex. 1001, [57]. Figure 26 of the '969 patent is reproduced below:

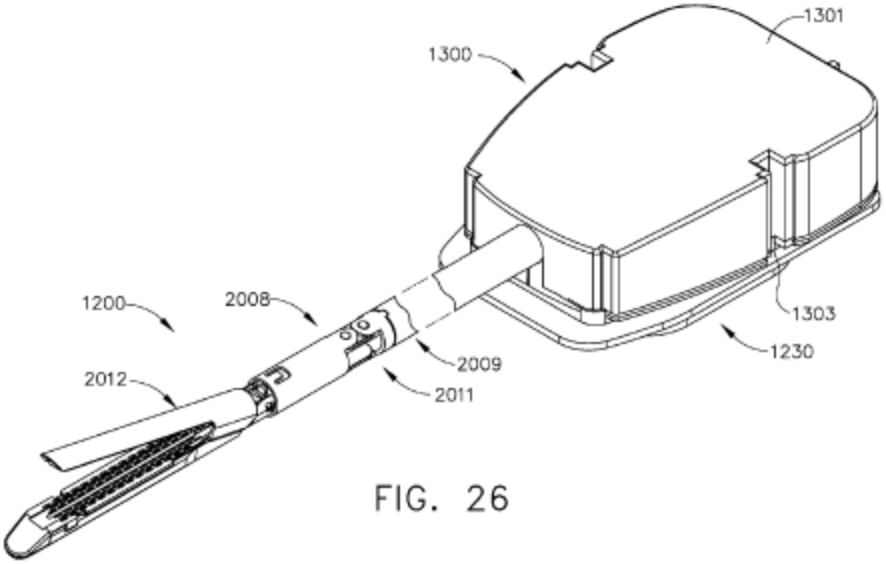

FIG. 26

Figure 26 depicts "a perspective view of a surgical tool embodiment of the present invention." Ex. 1001, 5:19–20. Figure 26 illustrates surgical tool 1200 with an end effector 2012, elongated shaft assembly 2008, and articulation joint 2011. Ex. 1001, 24:66–25:5. The '969 patent describes

that surgical tool 1200 is coupled to a robotic manipulator (not shown) by a tool mounting portion 1300. Ex. 1001, 25:5–7.

Figure 31 of the '969 patent is reproduced below:

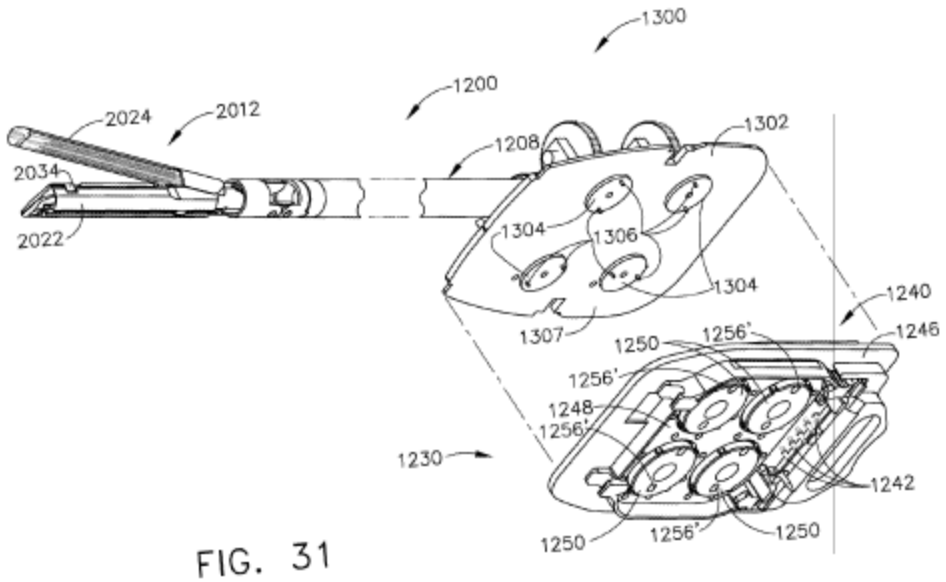

FIG. 31

Figure 31 depicts "a partial bottom perspective view of the surgical tool embodiment of FIG. 26." Ex. 1001, 5:27–28. Figure 31 illustrates "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." Ex. 1001, 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**." Ex. 25:19–22. The '969 patent describes that "adapter portion **1240** generally includes a tool side **1244** and a holder side **1246**." Ex. 1001, 25:30–31.

Figure 27 of the '969 patent is reproduced below:

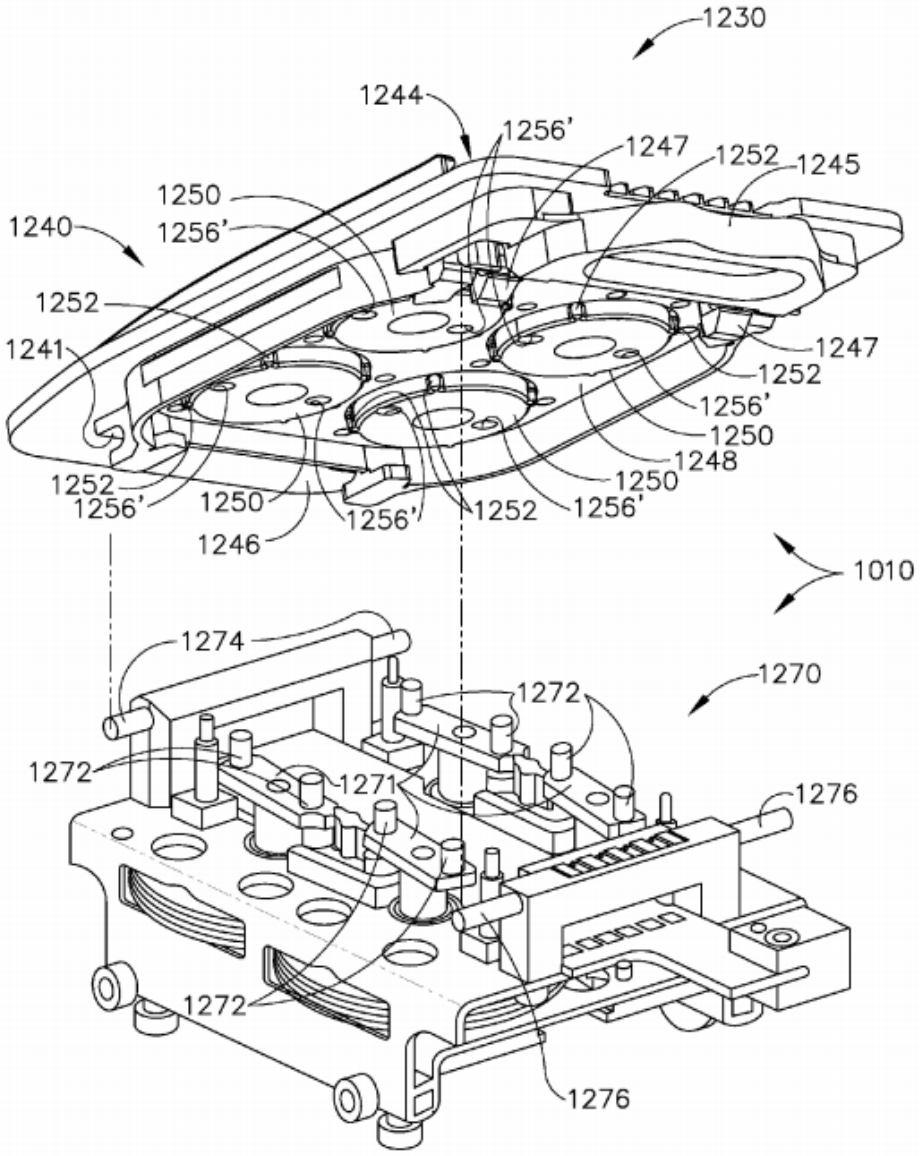

FIG. 27

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

B. Illustrative Claims

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. Claim 19 is illustrative and is 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.

C. Related Proceedings

The parties indicate that the '969 patent is involved in: *Ethicon LLC et al. v. Intuitive Surgical, Inc. et al.*, No. 1:17-cv-00871 in the United States District Court for the District of Delaware ("the Delaware litigation").[2] Pet. 4; 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); and (6) Case No. IPR2018-01703 (the '431 patent).

D. Earliest Effective Filing Date

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. Pet. 9.

Patent Owner asserts that the '969 patent "claims priority to application No. 11/651,807, which was filed on Jan. 10, 2007." Prelim.

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[2] 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.

Resp. 11 (citing Ex. 1001, (63). Patent Owner further asserts

> [b]ecause the Petition should be denied, for the reasons set forth herein, regardless of the effective filing date of the challenged claims, Patent Owner does not address Petitioner's priority date arguments herein, but reserves all rights to subsequently contend in any instituted IPR or in any other proceeding that the challenged claims are entitled to their earliest claimed effective filing date.

Prelim. Resp. 11. In view of the above, and at this stage, we do not resolve this issue at this time.

E. Real Parties in Interest

Petitioner identifies itself as the only real party-in-interest. Pet. 1.

F. Evidence Relied Upon

Petitioner relies on the following references[3] 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 issued Mar. 2, 2004 ("Wallace")	1008
U.S. Patent No. 6,783,524 issued Aug. 31, 2004 ("Anderson")	1010
U.S. Patent No. 7,510,107 issued Mar. 31, 2009 ("Timm")	1011
U.S. Patent No. 5,465,895 issued Nov. 14, 1995 ("Knodel")	1012

[3] We note that the Petition identifies U.S. Patent No. 6,817,974 issued Nov. 16, 2004 ("Cooper") with respect to Ground 1. *See* Pet. 5. However, given that Ground 1 only addresses disclaimed independent claim 23, our decision makes no reference to Ground 1 or the Cooper reference.

U.S. Patent No. 5,954,259 issued Sept. 21,1999 ("Viola")	1013

Petitioner also relies upon a Declaration of Dr. Bryan Knodel. Ex. 1004.

G. The Asserted Grounds of Unpatentability

Petitioner contends that claims 19–22 and 24–26 are unpatentable based on the following grounds[4]:

References	Basis	Claim(s) Challenged
Anderson and Timm	§ 103	24
Anderson, Timm, and Wallace	§ 103	25 and 26
Anderson and Knodel	§ 103	19 and 20
Anderson and Viola	§ 103	21 and 22

III. ANALYSIS

A. Claim Construction

The claim construction standard to be employed in an *inter partes* review recently has changed. *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 (Nov. 13, 2018) (to be codified at 37 C.F.R. pt. 42). That new standard, however, applies only to proceedings in which the petition is filed on or after November 13, 2018. This Petition was filed on June 14, 2018. Under the standard in effect at that time, "[a] claim in an unexpired patent . . . shall be given its broadest reasonable construction

[4] We note that the Petition identifies U.S. Patent No. 6,817,974 issued Nov. 16, 2004 ("Cooper") with respect to Ground 1. *See* Pet. 5. However, given that Ground 1 only addresses disclaimed independent claim 23, our decision makes no reference to Ground 1 or the Cooper reference.

in light of the specification of the patent in which it appears." 37 C.F.R. § 42.100(b); *see also Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2142 (2016) (upholding the use of the broadest reasonable interpretation standard). Accordingly, we determine whether to institute trial in this proceeding using the broadest reasonable construction standard. In determining the broadest reasonable construction, we presume that claim terms carry their ordinary and customary meaning. *See In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). A patentee may define a claim term in a manner that differs from its ordinary meaning; however, any special definitions must be set forth in the specification with reasonable clarity, deliberateness, and precision. *See In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

Here, neither Petitioner nor Patent Owner identifies terms for construction or provides any proposed constructions. *See* Pet. 10; Prelim. Resp. 11–12. Instead, the parties agree that claims of '969 patent should be construed according to their broadest reasonable interpretation. Pet. 10; Prelim. Resp. 11. For the purposes of this Decision, we determine that no claim term needs express interpretation. *See Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) ("[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 Declarant, 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 challenge the above-noted testimony or offer any assessment of its own as to the level of ordinary skill in the art. For purposes of this Decision, we adopt Dr. Knodel's assessment of the level of ordinary skill in the art. We further find that the cited prior art references reflect the appropriate level of skill at the time of the claimed invention and that the level of appropriate skill reflected in these references is consistent with the definition of a person of ordinary skill in the art proposed by Petitioner. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001).

C. Ground 2: Claim 24 – Obvious over Anderson and Timm

Petitioner contends that claim 24 would have been obvious over Anderson and Timm. Pet. 29–56. Patent Owner opposes. Prelim. Resp. 25–32.

1. Overview of Anderson (Ex. 1010)

Anderson is titled "Robotic Surgical Tool With Ultrasound Cauterizing and Cutting Instrument." Ex. 1010, (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 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.

Ex. 1010, (57). Figure 2 of Anderson is reproduced below.

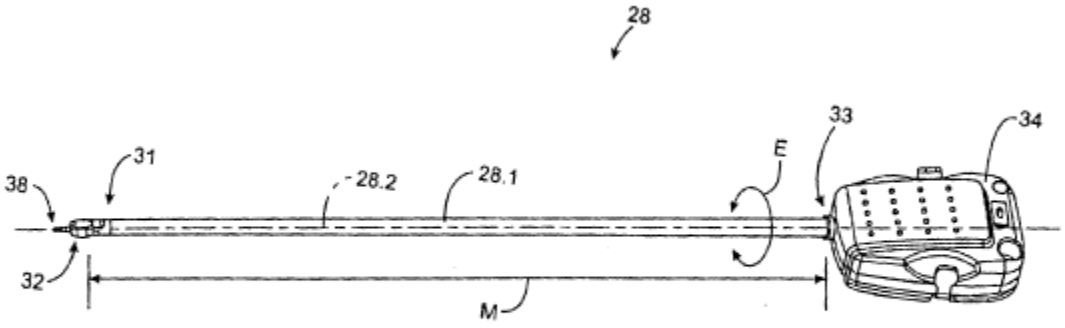

FIG. 2

Figure 2 depicts a perspective view of a robotic surgical tool which may be used with a robotic surgical system according to the present invention. Ex. 1010, 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." Ex. 1010, 11:32–36. Anderson further discloses

> [b]ase **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**.

Ex. 1010, 11:36–42.

Figure 10 of Anderson is reproduced below.

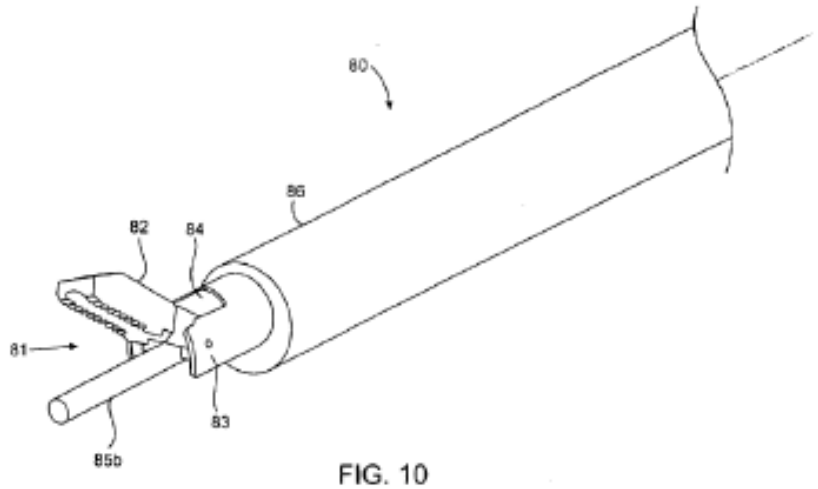

FIG. 10

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**." Ex. 1010, 15:29–55.

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

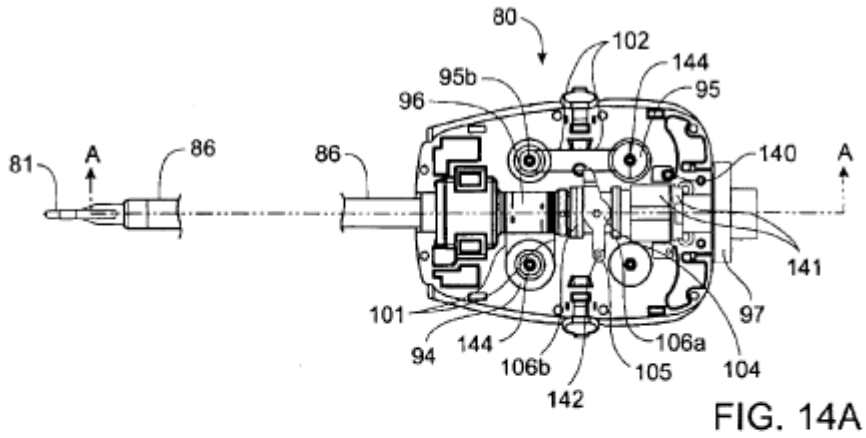

FIG. 14A

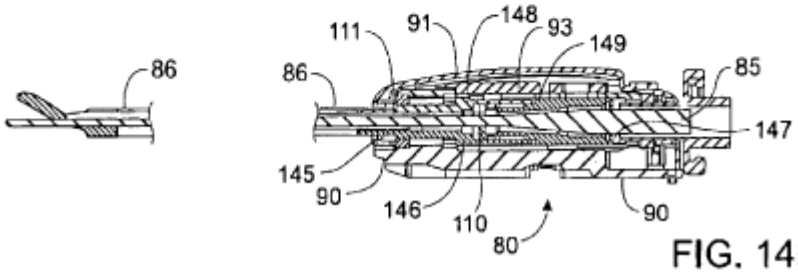

FIG. 14B

Figures 14A and 14B depict a top-view and side-view, respectively, of a tool base according to the present invention. Ex. 1010, 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." Ex. 1010, 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." Ex. 1010, 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**." Ex. 1010, 26–30.

2. Overview of Timm (Ex. 1011)

Timm is titled "Cable Driven Surgical Stapling and Cutting Instrument with Apparatus for Preventing Inadvertent Cable Disengagement." Ex. 1011, (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.

Ex. 1011, (57). Figure 1 of Timm is reproduced below.

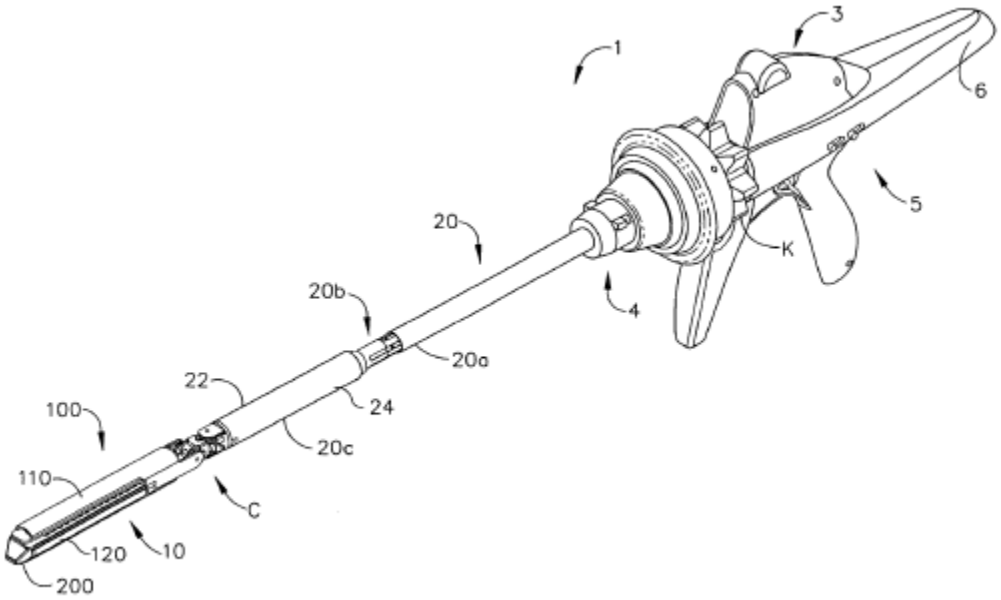

FIG. 1

Figure 1 depicts "a perspective view of a surgical stapling and severing instrument." Ex. 1011, 3:1–3. More particularly, Figure 1 depicts 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.

Ex. 1011, 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." Ex. 1011, 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." Ex. 1011, 8:3–8; *see also id.* at 12:1–3, 28:45–49.

3. Petitioner's Contentions

Petitioner contends that claim 24 of the '969 patent would have been obvious in view of the combined teachings of Anderson and Timm. Petitioner provides detailed assessment of the content of the prior art in advocating that all the features of claim 24 are shown therein. *See* Pet. 29–56. Petitioner also supports that assessment with citation to the Declaration testimony of Dr. Knodel (Ex. 1004).

For example, the preamble 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:

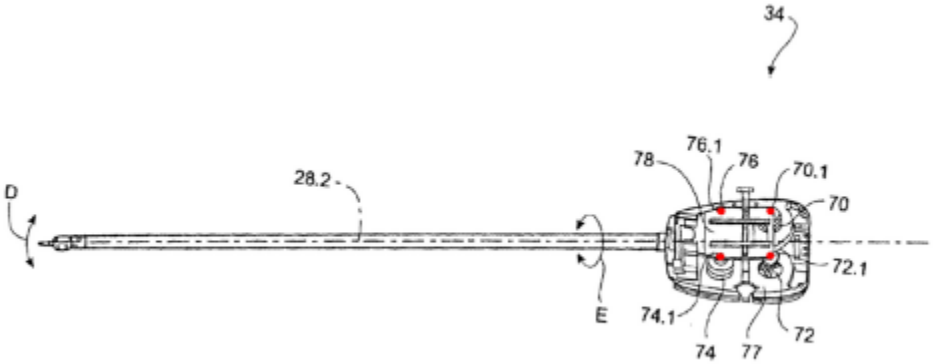

FIG. 3

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, Abs., 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][5] 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 further respect in connection with the requirement noted above of

[5] On January 23, 2018, the PTO entered a Certificate of Correction replacing the word "distal" with the word "proximal." *See* Ex. 1002, 686.

"a proximal spine portion pivotally coupled to [a] distal spine portion at an articulation joint to facilitate articulation of said surgical end effector," Petitioner 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, Abstract, 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). 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 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 ¶ 99). 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).

4. Patent Owner's Contentions

Patent Owner contends that Petitioner's ground of unpatentability based on Anderson and Timm is deficient. *See* Prelim. Resp. 25–32. Patent Owner first contends that "Petitioner provides no explanation for how the robotic ultrasound tool of Anderson and the handheld endocutter of Timm would be combined with each other as proposed in Ground 2." Prelim. Resp. 25. More particularly, Patent Owner argues

> Petitioner does not clarify whether the combined surgical instrument would have retained any physical controls on a handle, as in Timm, or whether all control motions would be provided through the robotic system, as in Anderson. Critically, to the extent that the Petition is understood to suggest the latter, Petitioner does not explain how Anderson's instrument base would be modified to provide additional rotary outputs to provide the necessary control motions for firing Timm's endocutter or articulating the shaft about the articulation joint.

Prelim. Resp. 21–22. Patent Owner also contends that "Petitioner does not clarify, for example, how the gears from the handle and/or intermediate closure tube segment of Timm's instrument would have been incorporated into Anderson's device." *Id.* at 31 (citing Pet. 45, 50). And, because "the proposed combination of Anderson with Timm is incompatible and inoperable" (*id.* at 32), Patent Owner contends that Petitioner has not provided any evidence of a reasonable expectation of success in combining Anderson and Timm. *Id.* at 25–26.

5. Discussion

Having considered the conflicting positions of the parties, we conclude that, at this stage of the proceeding, Petitioner has shown a reasonable likelihood that it would prevail in challenging the patentability of claim 24. In our view, Petitioner's obviousness approach, on this record,

adequately identifies where all the elements of claim 24 are found in the prior art, and Petitioner demonstrates adequate reasoning to combine the teachings of Anderson and Timm.

At this stage of the proceeding, we are not persuaded by Patent Owner's argument that a person of ordinary skill in the art would not have understood how, or had insufficient reason, to combine the teachings of Anderson and Timm because Anderson is directed to "a robotic ultrasound tool" while Timm is directed to a "handheld endocutter." Prelim. Resp. 21–25. At the outset, we note that Anderson contemplates that "[f]or convenience and to minimize manufacturing costs, selected OEM components of commercially available instruments may optionally be included in the instrument **300**." Ex. 1010, 18:25–29. More particularly, Anderson describes that

> [i]n further examples, the instrument probe assembly may include suitable OEM components of biopsy probes, suction probes, substance injection probes, surgical accessory application probes, stapler probes, tissue grasping and cutting probes, and the like. Likewise, the instrument probe assembly may combine more than one of the medical functions of the above described instruments.

Ex. 1010, 7:19–25. As such, we agree with Petitioner that one of ordinary skill in the art would have had adequate reason to use Timm's "handheld endocutter," which includes an end effector with a surgical stapler, at least because it is one of the stated possible uses of the Anderson robotic system. *See* Pet. 31; Ex. 1004 ¶¶ 74–82. In our view, these statements suffice as an articulated reason with a rationale underpinning to support combining Anderson and Timm.

Patent Owner's argument that the Petition "does not explain how

Anderson's instrument base would be modified to provide additional rotary outputs to provide the necessary control motions for firing Timm's endocutter or articulating the shaft about the articulation joint" (Prelim. Resp. 29) is, at this stage, unpersuasive. Patent Owner's argument appears to be premised on the physical combinability of Anderson and Timm. However, "it is not necessary that the inventions of the references be physically combinable to render obvious the invention under review." *In re Sneed*, 710 F.2d 1544, 1550 (Fed. Cir. 1983); *see, e.g.*, *In re Mouttet*, 686 F.3d 1322, 1333 (Fed. Cir. 2012) ("It is well-established that a determination of obviousness based on teachings from multiple references does not require an actual, physical substitution of the elements."). Rather, the relevant inquiry is whether the claimed subject matter would have been obvious to those of ordinary skill in the art in light of the combined teachings of those references. *See In re Keller*, 642 F.2d 413, 425 (CCPA 1981). Based on the record before us, we are persuaded that Petitioner sufficiently explains how to incorporate the gear-driven surgical stapler end effector, closure tube, and actuation assemblies of Timm with Anderson's rotary robotic interface in the tool mounting portion. *See* Pet. 39–51; *see also* Ex. 1004 ¶¶ 92–103.

Having considered the arguments and evidence, we find at this stage of the proceeding that Petitioner has sufficiently shown that a person of ordinary skill in the art would have had a reason to combine Anderson and Timm with a reasonable expectation of success given that Anderson expressly suggests use of its robotic surgical system with "stapler probes, tissue grasping and cutting probes" (Ex. 1010, 7:19–25, 18:25–29) like the one utilized by the surgical instrument disclosed in Timm. We also note that Timm suggests operation by a robotic system is an alternative to a handle.

See, e.g., Ex. 1011, 8:5–7, 12:1–3, 28:45–49. We consider these contentions, which Petitioner supports with testimony from Dr. Knodel, to suffice as a showing of reasonable expectation of success in combining the teachings of the noted references. *See* Ex. 1004 ¶ 90.

On this record, we determine that the Petition shows a reasonable likelihood that Petitioner would prevail with respect to claim 24 being unpatentable over Anderson and Timm.

D. Grounds 3: Claims 25 and 26 – Obvious over Anderson, Timm, and Wallace

Petitioner contends that claims 25 and 26 would have been obvious over Anderson, Timm, and Wallace. Pet. 57–65. Patent Owner opposes. Prelim. Resp. 32–35.

1. Overview of Wallace (Ex. 1008)

Wallace is titled "Platform Link Wrist Mechanism." Ex. 1008, (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.

Ex. 1008, (57). Figure 1 of Wallace is reproduced below:

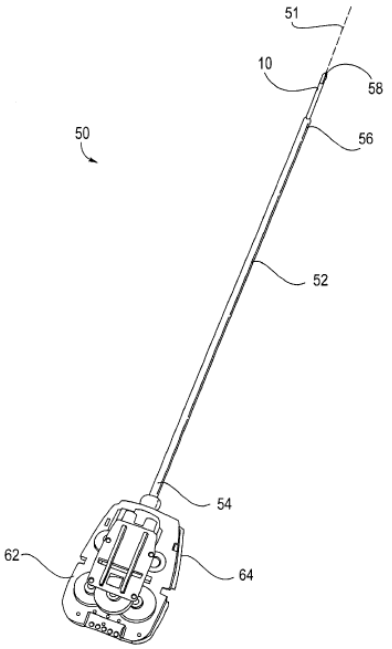

Fig. 1

Figure 1 "is a perspective overall view of an embodiment of the surgical tool of the present invention." Ex. 1008, 6:26–27. Figure 1 illustrates surgical tool 50 including

> rigid shaft **52** having a proximal end **54**, a distal end **56** and a longitudinal axis there between. The proximal end **54** is coupled to a tool base **62**. The tool base **62** includes an interface **64** which mechanically and electrically couples the tool **50** to a manipulator on the robotic arm cart. A distal member, in this embodiment a distal clevis **58**, is coupled to shaft **52** by a wrist joint or wrist mechanism **10**, the wrist mechanism **10** providing the distal clevis **58** with at least 1 degree of freedom and ideally providing at least 3 degrees of freedom. The distal clevis **58** supports a surgical end effector **66**, the actual working part that is manipulable for effecting a predetermined treatment of a target tissue.

Ex. 1008, 7:33–47. Wallace discloses that "end effector **66** is manipulated by the wrist mechanism **10** to provide the ability of continuous movement in a wide range of angles (in roll, pitch and yaw) relative to an axial direction or the longitudinal axis **51** of the shaft **52**." Ex. 1008, 7:57–60. Wallace

further discloses that its "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 axial direction or shaft." Ex. 1008, 3:54–59. Wallace additionally discloses that "[t]he plurality of rods may comprise two, three, four or more rods." Ex. 1008, 4:28–29.

2. Petitioner's Contentions

Petitioner contends that claims 25 and 26 of the '969 patent would have been obvious in view of the combined teachings of Anderson, Timm, and Wallace. Petitioner provides detailed assessment of the content of the prior art in advocating that all the features of claims 25 and 26 are shown therein. *See* Pet. 57–65. Petitioner also supports that assessment with citation to the Declaration testimony of Dr. Knodel (Ex. 1004).

Claim 25 depends from independent claim 24, and recites "wherein said at least one gear-driven portion comprises an articulation system interfacing with said distal spine portion and said transmission assembly." Ex. 1001, 96:16–19. Petitioner asserts that Anderson in view of Timm and Wallace discloses the aforementioned limitation. Pet. 57 (citing Ex. 1004 ¶¶ 116-124). Petitioner takes the position that it would have been obvious to replace "Timm's cable-driven articulation system with the gear-driven articulation system of Wallace." Pet. 57–59 (citing Ex. 1004 ¶¶ 121–124). Petitioner explains

> a POSITA would have recognized that, in the system resulting from the predictable combination of Anderson with Timm, Anderson contemplates "other actuation interface devices" such as "a gear train or other mechanical transmission means" and that

> this suggestion in Anderson for using a gear train would apply equally to all actuation motions, including actuation of articulation motion. [Ex.] 1010, 23:25–36. Accordingly, Anderson itself suggests turning to a system such as Wallace's for teachings on gear-driven actuation.

Pet. 57 (citing Ex. 1004 ¶ 122; Ex. 1008, 13:6–14:15; Ex. 1010, 23:25–36). Petitioner provides several reasons why a POSITA would have been motivated "to modify the system of Anderson and Timm to include a gear-driven articulation assembly (as suggested by Wallace)." Pet. 60–62 (citing Ex. 1011, 12:1–3, 8:3–7, 37:55–38:8, 40:34–63; Ex. 1008, Abstract, 2:61-3:5, 10:59-67, 7:33–56, 13:6–14:15; Ex. 1010, 25:10–11; Ex. 1004 ¶¶ 119–121).

Petitioner provides similar detailed analysis, supported by the testimony of Dr. Knodel, for claim 26. *See* Pet. 62–65.

3. Patent Owner's Contentions

Patent Owner contends that Petitioner's ground of unpatentability based on Anderson, Timm, and Wallace is deficient. *See* Prelim. Resp. 32–35. Patent Owner first contends that "Petitioner fails to explain how Wallace's articulation could be further incorporated into the combination of Anderson and Timm, which, as already discussed above, is itself incompatible and inoperable." Prelim. Resp. 34. More particularly, Patent Owner argues

> the proposed combination requires at least *five* transmission members: one for end effector rotation, one for opening and closing the end effector jaws, one for firing the stapler, and two for articulation (one for each degree of freedom, as taught in Wallace). As Petitioner admits, Anderson's tool base has only four transmission members. Petition at 60. Thus, like the proposed combination of Anderson and Timm, the proposed combination of Anderson, Timm, and Wallace is incompatible.

Prelim. Resp. 34–35. Patent Owner does not address claim 26 expressly.

4. Discussion

Having considered the conflicting positions of the parties, we conclude that, at this stage of the proceeding, Petitioner has shown a reasonable likelihood of that it would prevail in challenging the patentability of claims 25 and 26. In our view, Petitioner's obviousness approach, on this record, adequately identifies where all the elements of claims 25 and 26 are found in the prior art, and Petitioner demonstrates adequate reasoning to combine the teachings of Anderson, Timm, and Wallace.

At this stage of the proceeding, Patent Owner's argument that a person of ordinary skill in the art would not have understood or had a sufficient reason to combine the teachings of Anderson, Timm, and Wallace is unpersuasive. Here, as Petitioner points out, Anderson contemplates using "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." Pet. 57 (citing Ex. 1010, 23:25–36). Anderson also suggests the use of "[a]ny suitable combination of such hinges, wrist-like mechanisms, rotational devices and the like" are within the scope of Anderson's invention for motion of its end effector. *See* Ex. 1010, 15:66–16:6. As such, we agree with Petitioner that:

> a POSITA would have been prompted to modify the system of Anderson and Timm to include Wallace's gear-driven articulation assembly because doing so would be merely the application of a known technique (gear-driven articulation) to a known system (e.g., Anderson's surgical system as modified by Timm) ready for improvement to yield predictable results.

Pet. 61 (citing Ex. 1004 ¶ 121). In our view, these statements suffice as an articulated reason with a rationale underpinning to support combining Anderson, Timm, and Wallace.

At this stage of the proceeding, we are also unpersuaded by Patent Owner's argument that the proposed combination of Anderson, Timm, and Wallace is incompatible. *See* Prelim. Resp. 34–35. Patent Owner's argument appears to be premised on the physical combinability of Anderson, Timm, and Wallace. However, "it is not necessary that the inventions of the references be physically combinable to render obvious the invention under review." *Sneed*, 710 F.2d at 1550. Rather, the relevant inquiry is whether the claimed subject matter would have been obvious to those of ordinary skill in the art in light of the combined teachings of those references. *See Keller*, 642 F.2d at 425. Based on the record before us, we are persuaded that Petitioner provides sufficient reason to modify the system of Anderson and Timm to include Wallace's gear-driven articulation assembly. *See* Pet. 57–62; *see also* Ex. 1004 ¶¶ 121–124.

On this record, we determine that the Petition shows a reasonable likelihood that Petitioner would prevail with respect to claims 25 and 26 being unpatentable over Anderson, Timm, and Wallace.

E. Ground 4: Claims 19 and 20 – Obvious over Anderson and Knodel

Petitioner contends that claims 19 and 20 would have been obvious over Anderson and Knodel. Pet. 65–79. Patent Owner opposes. Prelim. Resp. 35–39.

1. Overview of Knodel (Ex. 1012)

Knodel is titled "Surgical Stapler Instrument." Ex. 1012, [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 [57].

Figure 1 of Knodel is reproduced below.

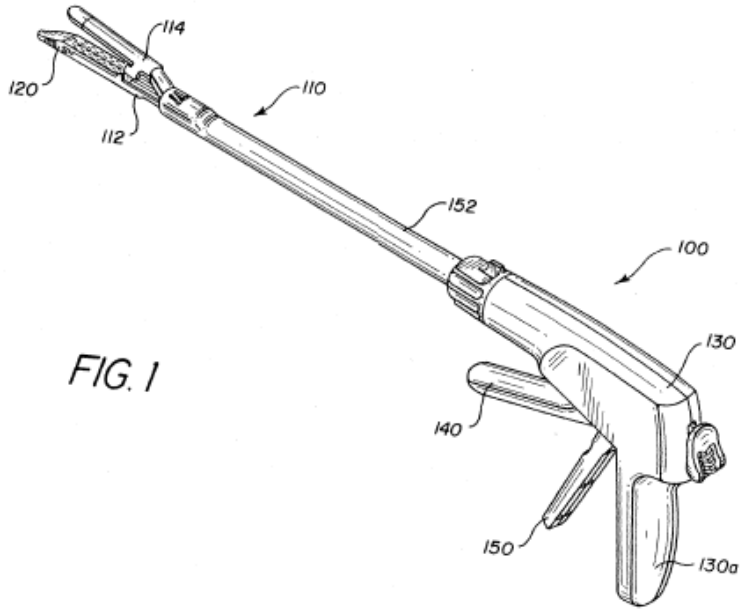

FIG. 1

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

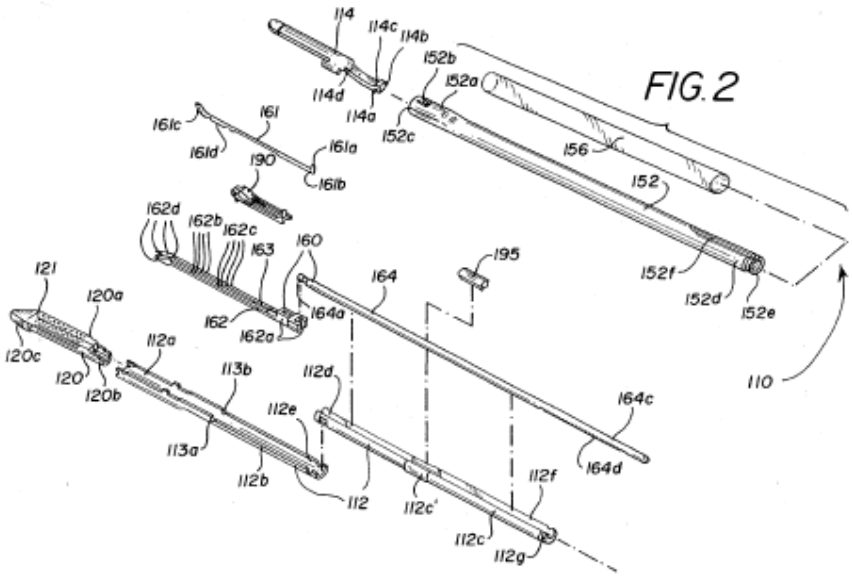

FIG. 2

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 is 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. Petitioner's Contentions

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. Petitioner provides detailed assessment of the content of the prior art in advocating that all the features of claims 19 and 20 are shown therein. *See* Pet. 65–79. Petitioner also supports that assessment with citation to the Declaration testimony of Dr. Knodel (Ex. 1004).

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.

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 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 Knodel discloses that the 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 which 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).

Petitioner provides similar detailed analysis, supported by the testimony of Dr. Knodel, for claim 20. *See* Pet. 77–79.

3. Patent Owner's Contentions

Patent Owner contends that Petitioner's ground of unpatentability based on Anderson and Knodel is deficient. *See* Prelim. Resp. 35–39. Patent Owner first contends that "Petitioner does not explain how a POSITA would have combined Anderson's ultrasound probe with the mechanical cutting and stapling elements from Knodel." Prelim. Resp. 35. Patent Owner points out that the stated purpose of Anderson relates to the advantages of providing ultrasound energy during minimally invasive robotic surgery, and argues that Petitioner fails to explain how a POSITA would have replaced Anderson's ultrasound end effector with Knodel's mechanical endocutter end effector "while still meeting Anderson's stated goal of enabling the advantages of ultrasound surgery." Prelim. Resp. 35–36 (citing Ex. 1010, 3:45–60, 4:7–10). Patent Owner also contends that "Petitioner provides no explanation of how a POSITA could have adapted Anderson's cable-driven mechanism for actuating the end effector with Knodel's gear-driven mechanism." Prelim. Resp. 36–37 (citing Pet. 76). And, because the proposed combination of Anderson with Knodel would result "in an incompatible and/or inoperable device" (Prelim. Resp. 37–38), Patent Owner contends that Petitioner has not provided any evidence of a reasonable expectation of success in combining Anderson and Knodel. Prelim. Resp. 38–39. Patent Owner does not address claim 20 expressly.

4. Discussion

Having considered the conflicting positions of the parties, we

conclude that, at this stage of the proceeding, Petitioner has shown a reasonable likelihood of success in challenging the patentability of claims 19 and 20. In our view, Petitioner's obviousness approach, on this record, adequately identifies where all the elements of claims 19 and 20 are found in the prior art, and Petitioner demonstrates adequate reasoning to combine the teachings of Anderson and Knodel.

At this stage of the proceeding, we are not persuaded by Patent Owner's argument that a person of ordinary skill in the art would not have understood or had a sufficient reason to combine the teachings of Anderson and Knodel because Anderson is directed to "a robotic ultrasound tool" and Knodel is directed to a "handheld endocutter." Prelim. Resp. 35–39. At the outset, and as discussed above with respect to Ground 2, Anderson contemplates that its instrument probe assembly may include "suitable OEM components" such as "stapler probes, tissue grasping and cutting probes, and the like." Ex. 1010, 7:19–25, 18:25–29. As such, we agree with Petitioner that "[a] POSITA therefore would have turned to Knodel 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. 70–71 (citing Ex. 1004 ¶¶ 130–133). In our view, these statements suffice as an articulated reason with a rationale underpinning to support combining Anderson and Knodel.

We also are not persuaded by Patent Owner's argument that Petitioner fails to explain how a POSITA would have replaced Anderson's ultrasound end effector with Knodel's mechanical endocutter end effector "while still meeting Anderson's stated goal of enabling the advantages of ultrasound surgery." Prelim. Resp. 35–36. Instead, on the record before us, we are

persuaded Petitioner has shown sufficiently for institution that a POSITA would have recognized that Anderson contemplates use of its robotic surgical system with "stapler probes" (Pet. 70).

Patent Owner's argument that the Petition does not explain how a "POSITA could have adapted Anderson's cable-driven mechanism for actuating the end effector with Knodel's gear-driven mechanism" (Prelim. Resp. 36–37 (citing Pet. 76) is, at this stage, unpersuasive. Patent Owner's argument appears to be premised on the physical combinability of Anderson and Knodel. However, we again take note that "it is not necessary that the inventions of the references be physically combinable to render obvious the invention under review." *In re Sneed*, 710 F.2d at 1550. Rather, the relevant inquiry is whether the claimed subject matter would have been obvious to those of ordinary skill in the art in light of the combined teachings of those references. *See In re Keller*, 642 F.2d at 425. Based on the record before us, we are persuaded that Petitioner provides sufficient explanation as to how to incorporate Knodel's surgical stapler end effector and gear-driven knife bar, i.e., "drive member 164," with "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. 74–76 (citing Ex. 1010, 11:59–12:22; 22:59–23:30, 24:23–65, Figs. 3, 21, 22; Ex. 1004 ¶¶ 143–145).

Having considered the arguments and evidence, we find at this stage of the proceeding that Petitioner has sufficiently shown that a person of ordinary skill in the art would have had a reason to combine Anderson and Knodel as Anderson expressly suggests use of its robotic surgical system

with "stapler probes, tissue grasping and cutting probes" (Ex. 1010, 7:19–25, 18:25–29) like the one utilized by the surgical instrument disclosed in Knodel. We consider these contentions, which Petitioner supports with testimony from Dr. Knodel, to suffice as a showing of reasonable expectation of success in combining the teachings of Anderson and Knodel. *See, e.g.*, Ex. 1004 ¶ 130.

On this record, we determine that the Petition shows a reasonable likelihood that Petitioner would prevail with respect to claims 19 and 20 being unpatentable over Anderson and Knodel.

F. Ground 5: Claims 21 and 22 – Obvious over Anderson and Viola

Petitioner contends that claims 21 and 22 would have been obvious over Anderson and Viola. Pet. 79–92. Patent Owner opposes. Prelim. Resp. 35–39.

1. Viola (Ex. 1013)

Viola is titled "Self-Contained Powered Surgical Apparatus for Applying Surgical Fasteners." Ex. 1013, [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.

Ex. 1013, [57]. Figure 1 of Viola is reproduced below.

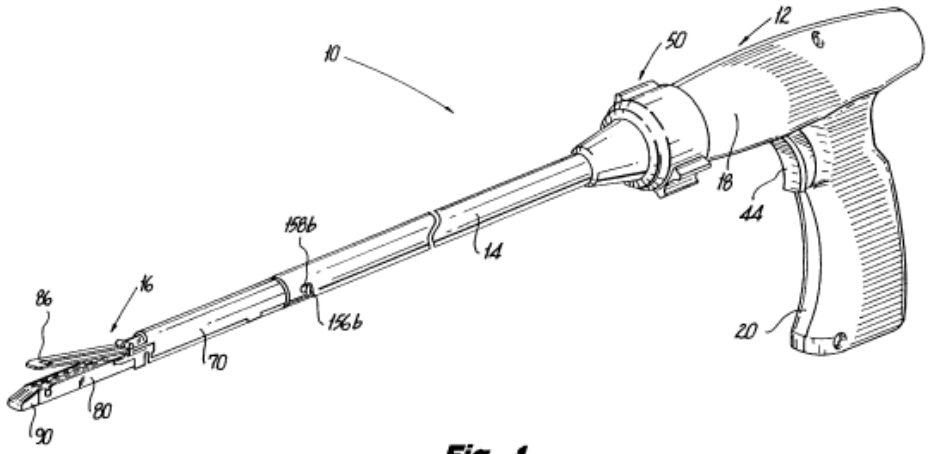

Fig. 1

Figure 1 depicts a perspective view of a powered surgical stapler. Ex. 1013, 3:14–16. Figure 1 illustrates surgical stapler 10 which includes handle portion 12, elongate body portion 14, cartridge assembly 16 detachably connected to a distal end of body portion 14. Ex. 1013, 4:10–17.

Figure 2 of Viola is reproduced below.

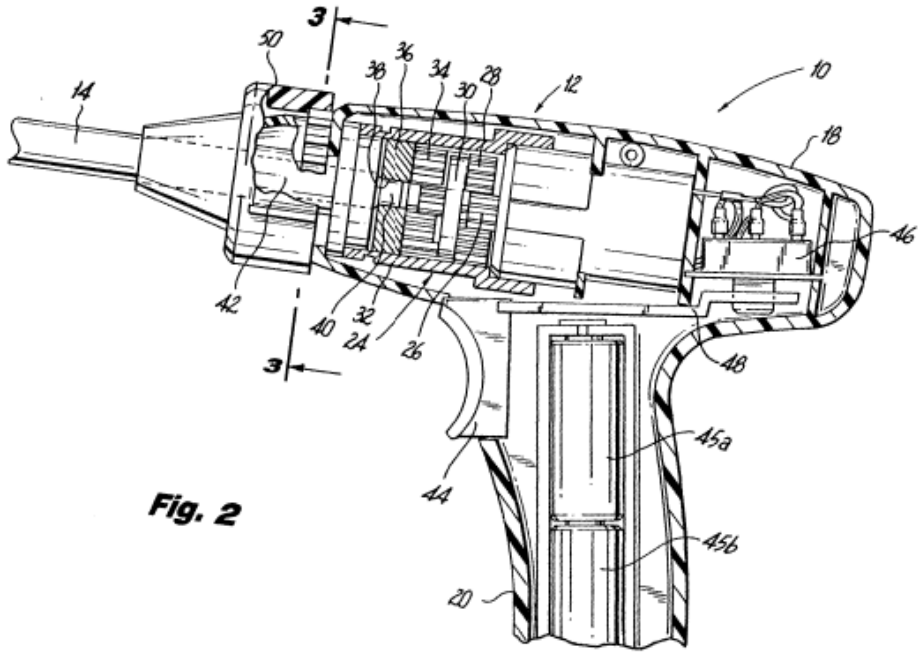

Fig. 2

Figure 2 depicts a side elevational view in cross-section of the handle assembly of Viola's powered surgical stapler. Ex. 1013, 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**.

Ex. 1013, 4:18–26. Figure 5 of Viola is depicted below.

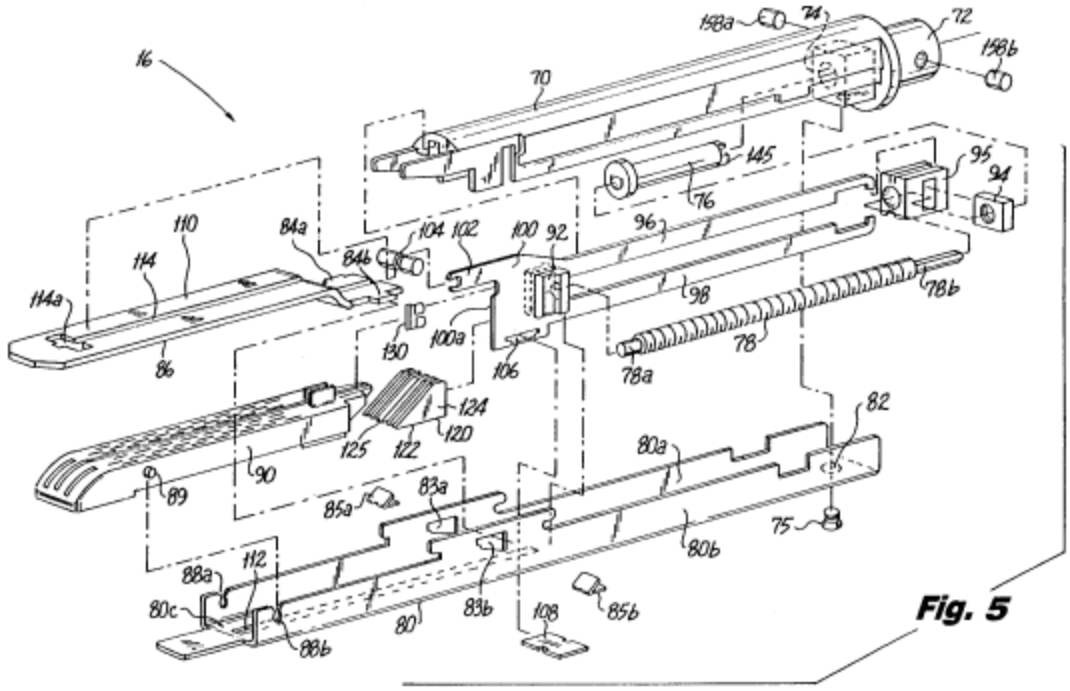

Figure 5 depicts an exploded perspective view of the cartridge assembly 16 of Viola's powered surgical stapler. Ex. 1013, 3:33–34. Figure 5 illustrates that "[c]artridge assembly **16** includes two main structural portions, a cartridge adaptor **70** and an elongated housing channel **80**." Ex. 1013, 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**.

Ex. 1013, 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." Ex. 1013, 6:26–32.

2. 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 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 also supports that assessment with citation to the Declaration testimony of Dr. Knodel (Ex. 1004).

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. 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).

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. 80–82); (2) "a rotary end effector drive shaft operably supported within an elongated channel" (*id.* at 82–83); (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" (*id.* at 83–86); (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" (*id.* at 86–88); (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" (*id.* at 88–89); 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 rotary end effector drive shaft" (*id.* at 89–90).

In further respect 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 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 "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. *See* Pet. 90–92.

3. Patent Owner's Contentions

Patent Owner contends that Petitioner's ground of unpatentability based on Anderson and Viola is deficient. *See* Prelim. Resp. 35–39. Patent Owner first contends that "Petitioner does not explain how a POSITA would have combined Anderson's ultrasound probe with the mechanical cutting and stapling elements" from Viola. Prelim. Resp. 35. Patent Owner points out that the stated purpose of Anderson relates to the advantages of providing ultrasound energy during minimally invasive robotic surgery, and argues that Petitioner fails to explain how a POSITA would have replaced

Anderson's ultrasound end effector with Viola's mechanical endocutter end effector "while still meeting Anderson's stated goal of enabling the advantages of ultrasound surgery." Prelim. Resp. 35–36 (citing Ex. 1010, 3:45–60, 4:7–10). Patent Owner also contends that "Petitioner provides no explanation of how a POSITA could have adapted Anderson's cable-driven mechanism for actuating the end effector with . . . Viola's drive shaft mechanism." Prelim. Resp. 36–37 (citing Pet. 85). And, because the proposed combination of Anderson with Viola would result "in an incompatible and/or inoperable device" (Prelim. Resp. 37–38), Patent Owner contends that Petitioner has not provided any evidence of a reasonable expectation of success in combining Anderson and Viola. Prelim. Resp. 38–39. Patent Owner does not address claim 22 expressly.

4. Discussion

Having considered the conflicting positions of the parties, we conclude that, at this stage of the proceeding, Petitioner has shown a reasonable likelihood of success in challenging the patentability of claims 21 and 22. In our view, Petitioner's obviousness approach, on this record, adequately identifies where all the elements of claims 21 and 22 are found in the prior art, and Petitioner demonstrates adequate reasoning to combine the teachings of Anderson and Viola.

At this stage of the proceeding, we are not persuaded by Patent Owner's argument that a person of ordinary skill in the art would not have understood or had a sufficient reason to combine the teachings of Anderson and Viola because Anderson is directed to "a robotic ultrasound tool" and Viola is directed to a "handheld endocutter." Prelim. Resp. 35–39. As discussed above, Anderson contemplates that its instrument probe assembly

may include "suitable OEM components" such as "stapler probes, tissue grasping and cutting probes, and the like." Ex. 1010, 7:19–25, 18:25–29. As such, we agree with Petitioner that "[a] POSITA therefore 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. 81–82 (citing Ex. 1004 ¶¶ 154–156). In our view, these statements suffice as an articulated reason with a rationale underpinning to support combining Anderson and Viola.

We also are not persuaded by Patent Owner's argument that Petitioner fails to explain how a POSITA would have replaced Anderson's ultrasound end effector with Viola's mechanical endocutter end effector "while still meeting Anderson's stated goal of enabling the advantages of ultrasound surgery." Prelim. Resp. 35–36. Instead, on the record before us, we are persuaded Petitioner has shown sufficiently for institution that a POSITA would have recognized that Anderson contemplates use of its robotic surgical system with "stapler probes" (Pet. 70).

Patent Owner's argument that the Petition does not explain how a "POSITA could have adapted Anderson's cable-driven mechanism for actuating the end effector with . . . Viola's drive shaft mechanism" (Prelim. Resp. 36–37 (citing Pet. 85) is, at this stage, unpersuasive. Patent Owner's argument appears to be premised on the physical combinability of Anderson and Viola. Patent Owner's argument appears to be premised on the physical combinability of Anderson and Viola, which for reasons discussed above is not a requirement in an assessment of obviousness. *See In re Keller*, 642 F.2d at 425. Based on the record before us, we are persuaded that Petitioner provides sufficient explanation as to how to incorporate Viola's surgical

stapler and drive screw with "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 set 24 that drives Viola's drive screw 78." Pet. 89–90 (citing Ex. 1010, 11:66–12:22, 22:59–23:30, 24:23–39, Figs. 3, 21, 22; Ex. 1013, 7:56–65; 4:18–39, Fig. 2; Ex. 1004 ¶ 171).

Having considered the arguments and evidence, we find at this stage of the proceeding that Petitioner has sufficiently shown that a person of ordinary skill in the art would have had a reason to combine Anderson and Viola with a reasonable expectation of success given that Anderson expressly suggests use of its robotic surgical system with "stapler probes, tissue grasping and cutting probes" (Ex. 1010, 7:19–25, 18:25–29) like the one utilized by the surgical stapler instrument disclosed in Viola. We consider these contentions, which Petitioner supports with testimony from Dr. Knodel, to suffice as a showing of reasonable expectation of success. *See, e.g.*, Ex. 1004 ¶ 153.

On this record, we determine that the Petition shows a reasonable likelihood that Petitioner would prevail with respect to claims 21 and 22 being unpatentable over Anderson and Viola.

G. Patent Owner's Arguments under § 325(d)

Patent Owner argues that the Board should deny the Petition under 35 U.S.C. §325(d) as allegedly relying on the same prior art that the Office already considered during examination of the '969 patent. Prelim. Resp. 40–43. Patent Owner first contends that the '969 patent "expressly disclosed and incorporated by reference Anderson [Ex. 1010], as an example of prior art robotic systems that 'have in the past been unable to generate the

magnitude of forces required to effectively cut and fasten tissue.'" Prelim. Resp. 40 (quoting Ex. 1001, 23:6–29). Patent Owner asserts that Anderson is substantially similar to a reference relied upon by the Examiner, i.e., "the Examiner issued an office action rejecting several of the originally filed claims of the 969 Patent based on Tierney, resulting in Patent Owner amending its claims to include subject matter that was allowable over Tierney" (Prelim. Resp. 41 (citing Ex. 1002, 280–284, 295–311), and as such, "Anderson's teachings and other substantially similar disclosures were squarely before the Patent Office during examination." Prelim. Resp. 41. Patent Owner further contends the remaining prior art references (Timm, Wallace, Knodel, and Viola) were also disclosed, and considered by the Examiner, during prosecution, as evidenced by the Examiner's signature on Patent Owner's Information Disclosure Statement. Prelim. Resp. 41–42 (citing Ex. 1002, 357, 395, 401, 410, 568, 606, 612, 621).

We have considered Patent Owner's argument, but decline to exercise our discretion to deny institution of the grounds presented in this Petition. At the outset, we note that none of Anderson, Timm, Wallace, Knodel, or Viola was addressed substantively or relied upon by the Examiner, in any office action, during prosecution of the '969 patent. *See* Ex. 1002, 280–284. We acknowledge that Anderson was cited during prosecution in the Examiner's Notice of References Cited (*see* Ex. 1002, 285), however, it was never discussed by the Examiner or Applicant. Similarly, we acknowledge that each of Timm, Wallace, Knodel, and Viola were made of record during prosecution, they were merely presented to the Examiner "as part of an 82-page IDS that listed over 2,000 references." Pet. 6 (citing Ex. 1002, 357–438). In the present case, there is no indication that the Examiner has ever

considered the combinations presented in the Petition supported by the Declaration of Dr. Knodel. Consequently, on these facts, we decline to deny the Petition on the basis of 35 U.S.C. § 325(d).

IV. CONCLUSION

For the foregoing reasons, we determine that Petitioner has shown that there is a reasonable likelihood that it would prevail with regard to at least one of the claims challenged in the Petition. Accordingly, we institute *inter partes* review. 35 U.S.C. § 314(a). At this stage of the proceeding, we have not made a final determination as to the patentability of any challenged claim or any underlying factual or legal issue.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 19–22 and 24–26 of the '969 patent is instituted with respect to all grounds of unpatentability presented in the Petition; and

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

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