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Paper No. 9
Date: March 4, 2020

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AURIS HEALTH, INC.,
Petitioner,

v.

INTUITIVE SURGICAL OPERATIONS, INC.,
Patent Owner.

IPR2019-01532
Patent 6,491,701 B2

Before ULRIKE W. JENKS, TINA E. HULSE, and JAMES A. WORTH, *Administrative Patent Judges*.

HULSE, *Administrative Patent Judge*.

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

I. INTRODUCTION

Auris Health, Inc. ("Petitioner") filed a Petition requesting an *inter partes* review of claims 1, 7, 8, 11, 16, and 25 of U.S. Patent No. 6,491,701 B2 (Ex. 1001, "the '701 patent"). Paper 1 ("Pet."). Intuitive Surgical Operations, Inc. ("Patent Owner") filed a Preliminary Response to the Petition, including a disclaimer of claim 25. Paper 8, 1 ("Prelim. Resp."); Ex. 2001.

We have authority under 35 U.S.C. § 314, which provides that an *inter partes* review may not be instituted "unless . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." 35 U.S.C. § 314(a). Upon considering the argument and evidence presented in the Petition and Preliminary Response, we determine that Petitioner has established a reasonable likelihood that it would prevail in showing the unpatentability of at least one claim challenged in the Petition. Accordingly, we institute an *inter partes* review of claims 1, 7, 8, 11, and 16 of the '701 patent, but not disclaimed claim 25.

A. Real Parties-in-Interest

Petitioner identifies itself and Ethicon, Inc. and Johnson & Johnson as real parties-in-interest. Pet. iv. Patent Owner identifies itself and Intuitive Surgical, Inc. as real parties-in-interest. Paper 4, 1.

B. Related Proceedings

Patent Owner has asserted the '701 patent against Petitioner in a pending lawsuit, *Intuitive Surgical, Inc. v. Auris Health, Inc.*, No. 18-1359-MN (D. Del.). Pet. v; Paper 4, 1.

Petitioner has also filed a petition for *inter partes* review of related U.S. Patent No. 8,142,447 B2 in IPR2019-01533. Pet. iv.

Petitioner also identifies related patents and patent applications in the '701 patent family. Pet. iv.

C. The '701 Patent

The '701 patent relates to surgical tools for minimally invasive robotically enhanced surgical procedures. Ex. 1001, 1:32–36. The '701 patent explains that, in performing robotic surgery, different surgical tools are required, which leads to differences between the tool structures and the other components of the robotic system. *Id.* at 2:32–36. This requires time to reconfigure the robotic system to take advantage of a different tool, and to configure the master controller to control the degrees of motion of the tool. *Id.* at 2:44–47. According to the '701 patent, it would be desirable to reduce the delay associated with each tool change while improving the safety and reliability of the surgical system. *Id.* at 2:48–55.

The '701 patent describes a robotic surgical system that provides improved engagement structures for coupling robotic surgical tools with manipulator structures. *Id.* at 3:25–27. Figure 4 of the '701 patent is reproduced below:

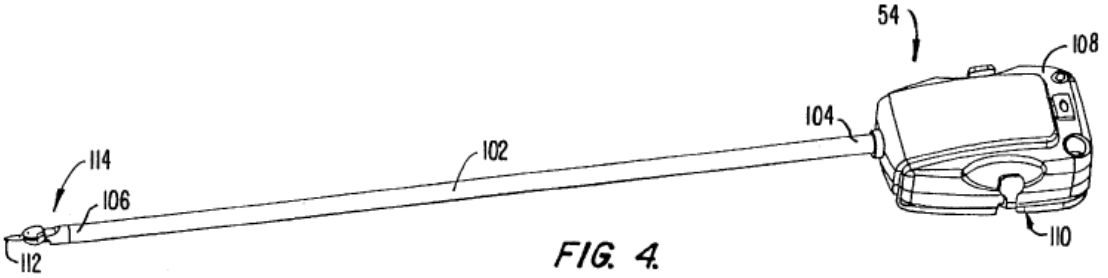

FIG. 4.

Figure 4 of the '701 patent depicts an exemplary tool of the invention. *Id.* at 5:62–63. The specification describes, with reference to Figure 4, that tool 54 includes shaft 102 having proximal end 104 and distal end 106. *Id.* at 9:29–31. Housing 108 at proximal end 104 includes interface 110, which mechanically and electrically couples tool 54 to a manipulator structure (not

shown). *Id.* at 9:31–33. Surgical end effector 112 is coupled to distal end 106 of shaft 102 at wrist joint 114, which provides at least 2 degrees of freedom. *Id.* at 9:33–36. Movement of the end effector is depicted in Figure 4A, reproduced below:

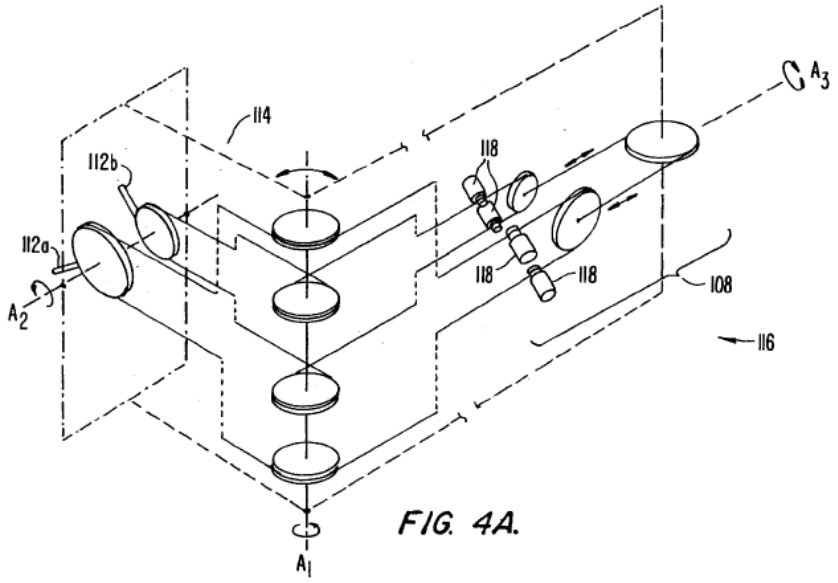

FIG. 4A.

Figure 4A is a schematic view of a drive system for the tool of Figure 4. *Id.* at 5:64–65. Drive system 116 mechanically couples first and second end effector elements 112a, 112b to driven elements 118 of interface 110, and translates mechanical inputs from driven elements 118 into articulation of wrist joint 114 about first and second axes A1 and A2. *Id.* at 9:37–44. Interface 110 is depicted in Figure 6, reproduced below:

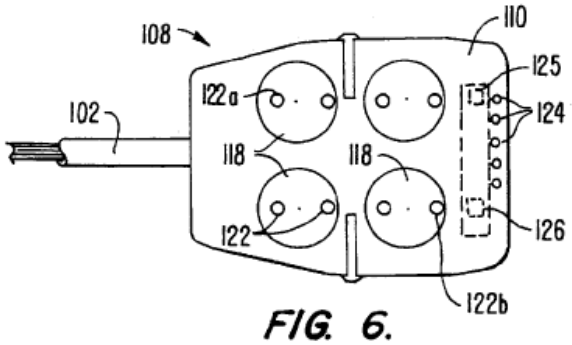

FIG. 6.

Figure 6 illustrates the mechanical and electrical interface of the tool of Figure 4. *Id.* at 6:1–2. Interface 110 includes a plurality of driven elements 118 that provide mechanical coupling of the end effector to drive motors mounted to the manipulator. *Id.* at 10:32–35. In the embodiment of Figure 6, driven elements 118 each include a pair of pins 122 extending from a surface thereof that couple with openings 140 in rotatable bodies 134 so as to align driven elements 118 of the tool with the drive elements of the holder. *Id.* at 10:35–37, 11:23–26. In an embodiment, rotatable bodies 134 are in adapter 128, as depicted in Figure 7B, reproduced below:

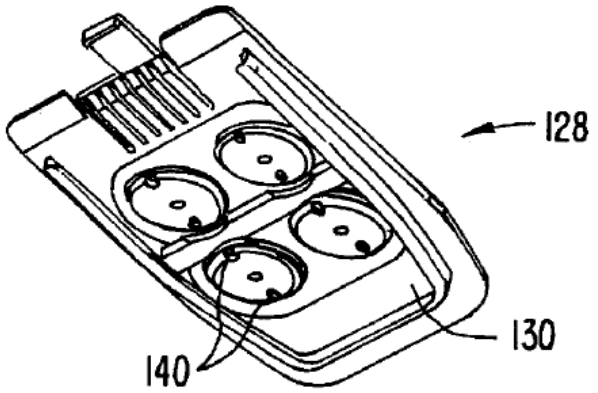

FIG. 7B.

Figure 7B illustrates an adapter for coupling the interface of Figure 6 to the surgical manipulator. *Id.* at 6:3–4. Coupling is depicted in Figure 14C, reproduced below:

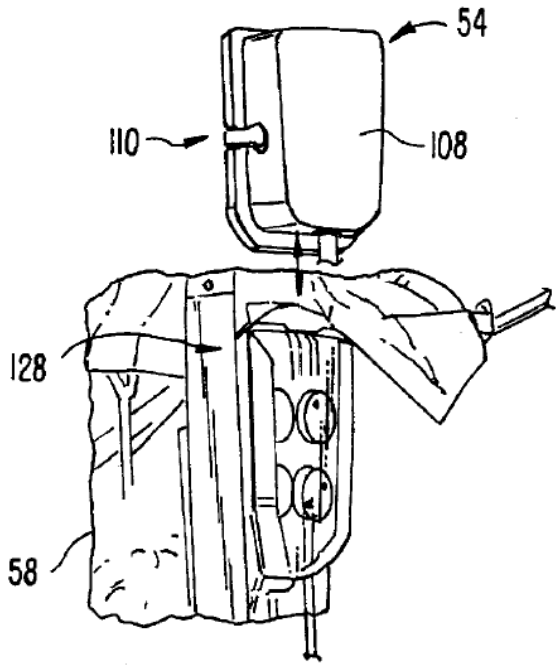

FIG. 14C.

Figure 14C illustrates the adapter of Figure 7B mounted to a manipulator arm, and depicts mounting the tool of Figure 4 onto the adapter. *Id.* at 6:30–32. In particular, mounting of tool 54 to adapter 128 includes inserting the surgical end effector distally through cannula 72 and sliding interface 110 of tool 54 into engagement with a mounted adapter. *Id.* at 17:17–21. The tool can be removed and replaced by reversing the above tool mounting procedure and mounting an alternative tool. *Id.* at 17:21–23.

D. Illustrative Claim

Petitioner challenges claims 1, 7, 8, 11, and 16 of the '701 patent, of which claim 1 is the only independent claim. Claim 1 is illustrative and is reproduced below:

> 1. A minimally invasive surgical instrument comprising
>
> a shaft having a working end;

an end effector mounting formation positioned at the working end of the shaft and arranged to be angularly displaceable about at least two axes;

elongate elements connected to the end effector mounting formation to cause selective pivotal movement of the end effector mounting formation about the axes in response to selective pulling of the elongate elements;

a support base positioned on an opposed end of the shaft; and

at least three spools angularly displaceably mounted on the support base and to which opposed ends of the elongate elements are connected so that selective angular displacement of the spools causes the selective pulling of the elongate elements, the spools having axes which are parallel and spaced apart relative to each other.

Ex. 1001, 18:7–24.

E. The Asserted Ground of Unpatentability

Petitioner asserts that claims 1, 7, 8, 11, and 16 are unpatentable based on the following ground:

Claim(s) challenged	35 U.S.C. §	References
1, 7, 8, 11, 16	102	Smith[1]

Petitioner also relies on the Declaration of Dr. William Cimino. Ex. 1003.

II. ANALYSIS

A. Person of Ordinary Skill in the Art

Petitioner asserts that a person of ordinary skill in the art at the time of the invention would include someone with a good working knowledge of

[1] Smith et al., US 5,624,398, issued Apr. 29, 1997 ("Smith," Ex. 1004).

robotics and medical devices. Pet. 9. Petitioner also asserts that a person of ordinary skill in the art at the time of the invention would include someone having an undergraduate education in electrical engineering, mechanical engineering, robotics, biomedical engineering, or a related field of study, along with about two years of experience in academia or industry studying or developing robotics or medical devices such as robotic surgical systems. *Id.* at 10 (citing Ex. 1003 ¶ 31). Patent Owner does not contest Petitioner's proffered definition and does not propose its own definition of the level of ordinary skill in the art in the Preliminary Response. *See generally* Prelim. Resp.

At this stage of the proceeding, and absent opposition from Patent Owner, we adopt Petitioner's definition of the level of ordinary skill in the art because it is consistent with the level of skill reflected in the asserted prior art references. Accordingly, the prior art itself is sufficient to demonstrate the level of skill in the art at the time of the invention. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (explaining that specific findings regarding ordinary skill level are not required "where the prior art itself reflects an appropriate level and a need for testimony is not shown" (quoting *Litton Indus. Prods., Inc. v. Solid State Sys. Corp.*, 755 F.2d 158, 163 (Fed. Cir. 1985))).

B. Claim Construction

Where, as here, a Petition is filed on or after November 13, 2018, the Board applies the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. § 282(b). 37 C.F.R. § 100(b) (2019); *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).

Under that standard, claim terms "are generally given their ordinary and customary meaning" as understood by a person of ordinary skill in the art at the time of the invention. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc). "In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence." *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17). Extrinsic evidence is "less significant than the intrinsic record in determining 'the legally operative meaning of claim language.'" *Phillips*, 415 F.3d at 1317.

Petitioner proposes constructions for several terms, but contends that "the Board likely will not need to adopt specific constructions to resolve any dispute." Pet. 11. Patent Owner does not propose any constructions for any claim terms. *See generally* Prelim. Resp.

At this stage of the proceeding, we determine that it is unnecessary to expressly construe any claim terms for purposes of rendering this Decision. *See Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011) ("[C]laim terms need only be construed 'to the extent necessary to resolve the controversy.'" (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

C. Anticipation by Smith

Petitioner asserts that claims 1, 7, 8, 11, and 16 are unpatentable as anticipated by Smith. Pet. 16–55. Patent Owner opposes Petitioner's assertion. Prelim. Resp. 9–14. On this record, we determine that Petitioner has established a reasonable likelihood that it would prevail in showing the challenged claims are anticipated by Dominguez.

1. Smith (Ex. 1004)

Smith relates to a robotic surgical system. Ex. 1004, 1:7–9. Figure 1B of Smith is reproduced below:

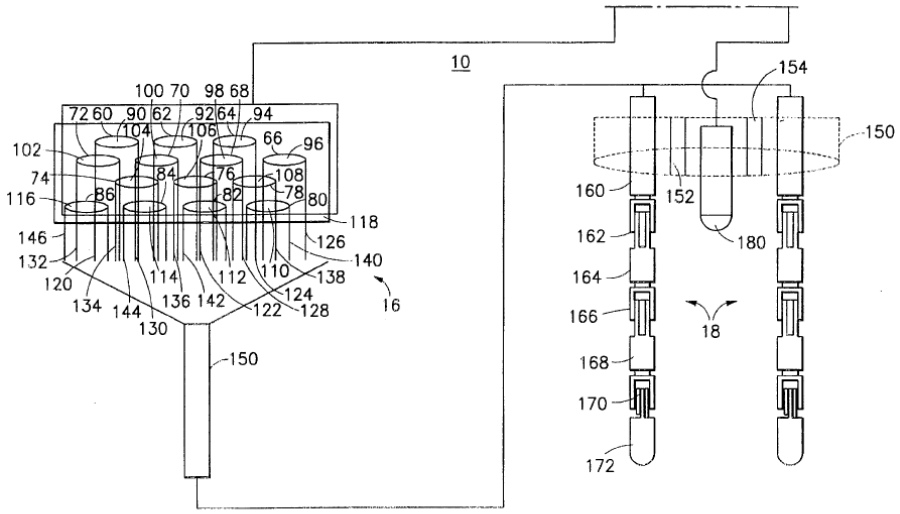

FIG. 1B

Figure 1B is a schematic illustration of one embodiment of an endoscopic robotic surgical tool. *Id.* at 5:52–53. Smith's system includes an exoskeleton encoder worn by a practitioner (*see* Figure 1A) and a pair of remote robot arms 18 at the distal end of multi-lumen tube 150. *Id.* at 6:46–49, 6:67–7:1. An end effector (e.g., grippers, cutters, dissectors, bioptomes) is mounted to the end of each robot arm. *Id.* at 4:40–41, 18:59–65. The end effectors may be interchanged during the course of a procedure by detaching the multilumen tube/robot arms assembly from the servo motor arrays. *Id.* at 19:2–5. The encoder, worn by the practitioner, has transducers that register the practitioner's rotational and flexional movements. *Id.* at 6:50–59. The transducers are coupled to a control circuit that provides outputs to an array of servo motors, which are coupled respectively to pulleys that are arranged in a tray. *Id.* at 6:59–64, 7:26–31. In particular, splined shafts of the servo motors engage receiving bores of the pulleys and are "self-aligning" with the

receiving bores, and the trays are arranged so that the pulley tray is sandwiched between two servo motor arrays. *Id.* at 14:53–64.

Figure 22 of Smith, reproduced below, depicts a sandwiched assembly:

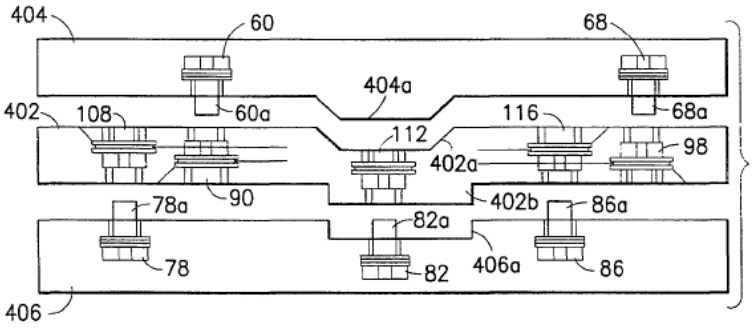

FIG. 22

Figure 22 is a side view of the top and bottom servo motor arrays 404 and 406 and pulley tray 402. *Id.* at 6:14–15.

The assembly is attached to other components as in Figure 23, reproduced below:

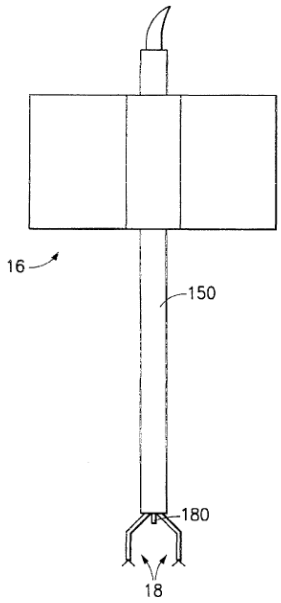

FIG. 23

Figure 23 depicts assembled servo motor tray 16, multi-lumen tube150, and robot arms 18. *Id.* at 6:15–16. In Figure 23, the pulley tray and servo motor trays are sandwiched together as servo system 16 and attached to multi-lumen tube 150. *Id.* at 14:42–44, 57–67. The pulleys in the pulley tray are each connected to a tendon loop, which are fed through the multi-lumen tube to the remote robot arms at the distal end of the tube. *Id.* at 6:67–7:2, 14:41–44. The tendons are depicted in Figure 34, reproduced below.

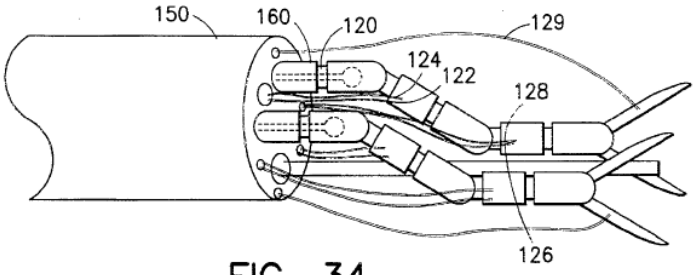

FIG. 34

Figure 34 depicts two robotic arms extending from the distal end of a multi-lumen tube. *Id.* at 6:40–41. Each of the remote robot arms has three rotational joints and three flexional joints and a gripper, such that the tendon loops are each connected to one of the joints and the gripper on each robot arm. *Id.* at 7:3–9. Based on how the tendons are connected to the joints, Smith's arrangement is rotatable about an axis of rotation and also is rotatable about an axis which is perpendicular to the axis of rotation. *Id.* at 16:65–17:12.

2. Analysis

Anticipation requires that "each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999) (citation omitted). "To establish inherency, the extrinsic evidence 'must make clear

that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.'" *Id.* (citation omitted). Moreover, to anticipate, a prior art reference must "disclose[] within the four corners of the document not only all of the limitations claimed but also all of the limitations arranged or combined in the same way as recited in the claim." *Net MoneyIN, Inc. v. Verisign, Inc.*, 545 F.3d 1359, 1371 (Fed. Cir. 2008).

Regarding claim 1, Petitioner asserts that Smith discloses, expressly or inherently, each limitation of the claim. Petitioner provides a detailed analysis identifying where each limitation is disclosed in Smith. Pet. 21–45. For example, Petitioner asserts Smith's multi-lumen tube 150 discloses the claimed "shaft." *Id.* at 23 (citing, e.g., Ex. 1004, 3:50–55, 4:30–31, 20:23–24, Figs. 1, 23, 24; Ex. 1003 ¶¶ 85–86). Petitioner asserts the Smith end effectors mounted at the distal end of tube 150 discloses an "end effector mounting formation." *Id.* at 24–29 (citing, e.g., Ex. 1004, 4:30–31, 8:5–7, 18:59–67, Figs. 26, 27, 34; Ex. 1003 ¶¶ 87–95). Petitioner asserts Smith discloses that each robot arm includes three rotational joints and three flexional joints that make pivotal movements that are driven by pulleys and connected tendons, thereby disclosing "elongate elements connected to the end effector mounting formation to cause selective pivotal movement of the end effector." *Id.* at 29–34 (citing, e.g., Ex. 1004, Abstract, 4:30–41, 7:3–19, 16:10–23; Ex. 1003 ¶¶ 96–103). Petitioner asserts Smith's tray-like housing shown in Figure 23 discloses "a support base positioned on an opposed end of the shaft." *Id.* at 34–37 (citing, e.g., Ex. 1004, 14:8–18, 14:64–67, Fig. 23; Ex. 1003 ¶¶ 104–110). And Petitioner asserts Smith's description of the pulley tray assembled with servo arrays discloses the claimed "at least three spools angularly displaceably mounted on the support

base and having axes which are parallel and spaced apart relative to each other." *Id.* at 38–45 (citing, e.g., Ex. 1004, 4:12–19, 6:62–7:2, 14:8–18; Ex. 1003 ¶¶ 111–124).

Having considered the evidence and argument cited by the Petition, which we adopt as our own for purposes of our preliminary findings, we are persuaded at this stage of the proceeding that Petitioner has shown a reasonable likelihood of showing that Smith discloses each limitation of claim 1.

Patent Owner opposes Petitioner's arguments, asserting Petitioner does not establish that Smith meets all limitations of claim 1. Prelim. Resp. 9–13. We are not persuaded that Patent Owner has identified any issue that overcomes the sufficiency of Petitioner's arguments at this stage of the proceeding.

Specifically, Patent Owner argues that Smith does not disclose "a support base positioned on an opposed end of the shaft." *Id.* at 9. Patent Owner argues that Petitioner's annotated version of Smith's Figure 23 only highlights a portion of the multi-lumen tube having servo tray and pulley tray assembly labeled "16." *Id.* at 11. Patent Owner provides an alternative annotated version of Smith's Figure 23, reproduced below:

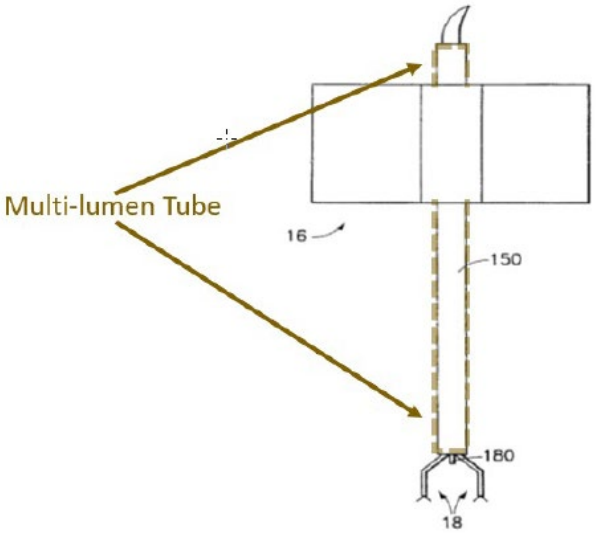

FIG. 23

Prelim. Resp. 12. Patent Owner's annotated Figure 23 of Smith includes a brown portion that extends past the servo motor and pulley tray labeled "16." *Id.* at 11–12. Patent Owner argues that Smith's element 16 is at an intermediate location of multi-lumen tube 150, and not "positioned on an opposed end of the shaft." *Id.* at 12.

At this stage of the proceeding and on this record, we are not persuaded. We find Petitioner has shown sufficiently that servo motor tray 16 (i.e., the support base) of Smith is positioned on an opposed end of multi-lumen tube 150 (i.e., the shaft).[2] Moreover, we note that Petitioner also relies on Figure 1B of Smith, which depicts the servo tray 16 at the proximal end of tube 150 without any structure extending above it. Pet. 16–17; *see also* Ex. 1004, Fig. 1B.

[2] It is not clear to us what the structure is above servo motor tray 16 in Figure 23. The structure is not labeled and the Smith specification does not appear to explain what it is. We, therefore, invite the parties to explore this issue further at trial.

Claims 7, 8, 11, and 16 depend from claim 1. We find Petitioner has shown sufficiently that Smith discloses the additional limitations of the dependent claims for the reasons stated in the Petition. *See* Pet. 45–56 (citing, e.g., Ex. 1004, 4:13–20, 14:48–67, 16:10–23, 16:39–17:14, 22:49–52, Figs. 22, 25–27, 34; Ex. 1003 ¶¶ 125–155). Patent Owner does not challenge Petitioner's argument regarding the dependent claims at this stage of the proceeding beyond its arguments with respect to claim 1. Prelim. Resp. 14.

Accordingly, having considered the parties' arguments and evidence, we determine, at this stage of the proceeding, that Petitioner has shown a reasonable likelihood of prevailing in its assertion that claims 1, 7, 8, 11, and 16 of the '701 patent are unpatentable as anticipated by Smith.

III. CONCLUSION

For the foregoing reasons, we conclude that Petitioner has established a reasonable likelihood of prevailing on its assertions that claims 1, 7, 8, 11, and 16 of the '701 patent are unpatentable. Accordingly, we institute an *inter partes* review of all of the challenged claims on the ground that those claims are anticipated by Smith.

Our determination in this Decision is not a final determination on either the patentability of any challenged claims or the construction of any claim term and, thus, leaves undecided any remaining fact issues necessary to determine whether sufficient evidence supports Petitioner's contentions by a preponderance of the evidence in the final written decision. *See Trivascular, Inc. v. Samuels*, 812 F.3d 1056, 1068 (Fed. Cir. 2016) (noting that "there is a significant difference between a petitioner's burden to establish a 'reasonable likelihood of success' at institution, and actually

proving invalidity by a preponderance of the evidence at trial") (quoting 35 U.S.C. § 314(a) and comparing id. § 316(e)).

IV. 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 1, 7, 8, 11, and 16 of the '701 patent is instituted on the ground that those claims are anticipated by Smith;

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4(b), *inter partes* review of the '701 patent shall commence on the entry date of this Order, and notice is hereby given of the institution of a trial.

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