UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

STRYKER CORPORATION,

Petitioner

v.

KARL STORZ ENDOSCOPY-AMERICA, INC.,

Patent Owner

Patent No. 7,844,657

Issue Date: November 30, 2010

Title: SYSTEM FOR CONTROLLING MEDICAL DEVICES

IPR Number 2015-00764

PETITION FOR *INTER PARTES* REVIEW

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Exhibit 1008: Declaration of Harold J. Walbrink

Pursuant to 35 U.S.C. §§ 311-319 and 37 C.F.R. § 42, Stryker Corporation ("Stryker" or "Petitioner") respectfully petitions for *inter partes* review ("IPR") of claims 21, 22, 28-31, 35, 61, 62, 68-71, and 75 of U.S. Patent No. 7,844,657 ("the '657 patent"), which issued on November 30, 2010, and is assigned to Karl Storz Endoscopy-America, Inc. ("KSEA" or "Patent Owner").

I. MANDATORY NOTICES UNDER 37 C.F.R. § 42.8

A. Real Party-In-Interest Under 37 C.F.R. § 42.8(b)(1)

Petitioner Stryker Corporation is the real party-in-interest. Stryker Communications, Inc., a wholly owned subsidiary of Stryker Corporation, is also an interested party.

B. Related Matters Under 37 C.F.R. § 42.8(b)(2)

KSEA asserted the '657 patent against Stryker in *Karl Storz Endoscopy-America, Inc. v. Stryker Corp. & Stryker Communications, Inc.*, Case No. 14-00876 (N.D. Cal.), filed February 26, 2014 ("the litigation"). KSEA served the complaint on Stryker no earlier than March 4, 2014. (Ex. 1007.) PCT/US04/19849, filed on June 23, 2004, which is published, claims benefit to the '657 patent's application. Stryker is filing petitions for *inter partes* review of the other four patents that KSEA asserted against Stryker in the litigation. (*See* IPR Nos. 2015-00672, 2015-00673, 2015-00674, 2015-00675, 2015-00677, 2015-00678, 2015-00679.)

C. Lead And Back-Up Counsel Under 37 C.F.R. § 42.8(b)(3)

Petitioner provides the following designation of counsel. Pursuant to 37 C.F.R. § 42.8(b)(4), a Power of Attorney accompanies this Petition. Lead Counsel: Robert A. Surrette (Reg. No. 52,262), bsurrette@mcandrews-ip.com. Back-up Counsel: Merle S. Elliott (Reg. No. 52,857), melliott@mcandrews-ip.com; Christopher M. Scharff (Reg. No. 53,556), cscharff@mcandrews-ip.com; and Caroline A. Teichner (Reg. No. 71,689), cteichner@mcandrews-ip.com. Post and Delivery: McAndrews, Held & Malloy, 500 West Madison St., 34th Floor, Chicago, IL 60661. Telephone: 312-775-8000. Facsimile: 312-775-8100.

D. Service Information Under 37 C.F.R. § 42.8(b)(4)

Please address all correspondence to the lead counsel at the address provided in Section I.C of this Petition. Petitioner also consents to electronic service by email at: StrykerKSIPR@mcandrews-ip.com.

II. PAYMENT OF FEES – 37 C.F.R. § 41.103

The required fee has been paid online. Please charge any fee deficiencies or credit any overpayments to the Deposit Account of McAndrews, Held & Malloy, Account No. 13-0017.

III. REQUIREMENTS FOR IPR UNDER 37 C.F.R § 42.104

A. Grounds For Standing Under 37 C.F.R. § 42.104(a)

Petitioner certifies that the ‘657 patent is available for IPR and that Petitioner is not barred or estopped from requesting IPR of the ‘657 patent.

B. Identification Of Challenge Under 37 C.F.R. § 42.104(b) And Relief Requested

Petitioner requests *inter partes* review of claims 21, 22, 28-31, 35, 61, 62, 68-71, and 75 of the '657 patent on the grounds set forth below and requests that these claims be found unpatentable. An explanation of how those claims are unpatentable under specified statutory grounds is provided below, including an identification of where each element is found in the prior art and the relevance of each reference. Additional explanation and support for this IPR and each ground of rejection is set forth in the Declaration of Harold J. Walbrink (Ex. 1008), which is submitted in accordance with 37 C.F.R. § 1.68. *Inter partes* review is requested in view of the following references:[1]

- U.S. Patent No. 6,951,535 ("Ghodoussi"), issued on Oct. 4, 2005, filed on Sept. 17, 2002, and claims priority to a parent application filed Jan. 16, 2002, which is §102(e) prior art (Ex. 1003);
- U.S. Patent No. 6,911,916 ("Wang"), issued on June 28, 2005, filed on July 13, 2000, and claims priority to parent applications filed on July 15, 1999, Aug. 6, 1996, and June 24, 1996, which is §102(e) prior art (Ex. 1004);
- U.S. Patent Publication No. 2001/0037366 ("Webb"), published Nov. 1, 2001, which is § 102(b) prior art (Ex. 1005); and

[1] The earliest claimed priority date for the '657 patent is January 17, 2003.

- U.S. Patent No. 5,813,972 ("Nazarian"), issued Sept. 29, 1998, which is § 102(b) prior art (Ex. 1006).

Ground	Proposed Statutory Rejections for the '657 patent
1	Claims 21, 22, 28-31, 35, 61, 62, 68-71, 75 anticipated by Ghodoussi
2	Claims 28, 68 obvious in view of Ghodoussi and Webb
3	Claims 35, 75 obvious in view of Ghodoussi and Nazarian
4	Claims 21, 22, 28-31, 35, 61, 62, 68-71, and 75 anticipated by Wang
5	Claims 21, 22, 28-31, 35, 61, 62, 68-71, and 75 obvious in view of Ghodoussi and Wang
6	Claims 28, 68 obvious in view of Wang and Webb
7	Claims 35, 75 obvious in view of Wang and Nazarian

C. Claim Construction Under 37 C.F.R. § 42.104(b)(3)

A claim subject to *inter partes* review is given its "broadest reasonable construction in light of the specification of the patent in which it appears," which may be a broader construction than applied by courts during claim construction. 37 C.F.R. § 42.100(b); *see also Corning Optical Comm. RF, LLC v. PPC Broadband, Inc.*, IPR2013-00340, Paper 79 (P.T.A.B. Nov. 21, 2014); Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,766 (Aug. 14, 2012). Further, "[c]onsistent with the broadest reasonable construction, claim terms are presumed to have their ordinary and customary meaning, as understood by a person of ordinary skill in the art, in the context of the entire patent disclosure." *AOL Inc. v. COHO Licensing, LLC*, IPR2014-771, Paper 10 (P.T.A.B. Nov. 20, 2014).

Petitioner proposes the following claim constructions:[2] In independent claims 21 and 61, an "***ancillary medical device [that is] not connectable to said [the] surgical network***" means a "medical device that cannot send data to or receive data from the surgical network absent a translator." (Ex. 1008, Walbrink Decl. at ¶ 30.) The '657 patent specification explains that "the invention relates to a system for simultaneously controlling primary medical devices, which are connected to a surgical network, <u>and ancillary devices, which are either not compatible with the surgical network</u> or transmit high-bandwidth data." (Ex. 1001, '657 patent at 1:12-17 (emphasis added).) The '657 patent further explains that, "[f]or this application, the term 'not compatible' as used herein means <u>unable to communicate data to, or receive data from, a device or network without the translation of that data</u>." (*Id.* at 4:17-20 (emphasis added); *see also id.* at Abstract, 1:64-2:6, 2:9-14, 2:30-33, 4:17-20, 5:31-39, 6:1-19, 7:52-8:7.) During prosecution of the '657 patent, the examiner equated the terms "incapable" and "not connectable." (Ex. 1002, File History of '657 patent at 183-84; Ex. 1008,

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[2] Because of the different claim construction standard in litigation, Petitioner reserves all of its rights with regard to constructions during litigation.

Walbrink Decl. at ¶ 30.)

In dependent claims 35 and 75, the term "***wherein said ancillary network includes a self-configuring bus***" means that "the ancillary network automatically reconfigures itself when devices connected thereto are removed or lose power, or when additional devices are connected thereto." (Ex. 1008, Walbrink Decl. at ¶ 31.) The '657 patent specification explains that "[i]t is generally known to use a central unit to control various medical devices . . . . One such system uses <u>a self-configuring bus</u> capable of interconnecting a large number of devices to the central unit as a way to centrally control various medical devices in an operating room with a single device. These surgical networks . . . may include, for example, <u>a CAN bus</u> monitored by a controller or master device and <u>automatically configured thereby when a particular device connected to the bus is removed from the network, added to the network, or loses power</u>. Such buses permit individual devices to be added or removed from the network without interfering with the operation of the other devices." (Ex. 1001, '657 patent at 1:28-48 (emphasis added); *see also id.* at 1:49-2:6, 4:32-37, 4:46-60 (identifying CAN bus as type of self-configuring bus), 5:1-19, 6:1-19, 7:43-51; Ex. 1008, Walbrink Decl. at ¶ 31.)

IV. BACKGROUND OF THE '657 PATENT

The '657 patent, which was filed on June 23, 2003 and claims an earliest priority date of January 17, 2003, is directed toward a system and method for controlling ancillary medical devices. (Ex. 1001, '657 patent at Abstract, Claims.) The '657 patent has 78 claims. Claims 1, 21, 38, 39, 40, 41, 61, and 78 are independent claims, but only claims 21 and 61 are presently being challenged in this Petition.

In claim 21, the '657 patent purports to claim "[a] system which controls ancillary medical devices, comprising: a surgical network; an input device, connected to said surgical network, which inputs a medical command; a controller, connected to said surgical network, which receives the medical command and generates corresponding medical command data; a translator, connected to said surgical network, which receives the medical command data via said surgical network and translates the medical command data; at least one ancillary medical device not connectable to said surgical network, in communication with said translator via an ancillary network, which receives the translated medical command data and carries out the corresponding medical command; and feedback data generated by said at least one ancillary medical device and communicated to said translator via said ancillary network." (*Id.* at claim 21.) Claim 61 recites "A method for controlling ancillary method devices" with steps that generally correspond to the limitations of independent claim 21. (*Id.* at claim 61.) The challenged dependent claims are directed toward additional known components of systems for controlling medical devices and known types of connections among those components.

Such systems for controlling medical devices are nothing new. (Ex. 1008, Walbrink Decl. at ¶¶ 40-50.) Microprocessors were first introduced to the medical industry in the early 1980s. (*See id.* at ¶ 41.) Translators were also used in many contexts in the medical industry before the alleged invention of the ‘657 patent. (*See id.* at ¶ 43.) For example, translators have been used for many years used to convert signals from one network protocol to another network protocol. (*See id.*) Devices made by different manufacturers may operate using different protocols and are unable to communicate with each other absent a translator. (*See id.*) Feedback is also a basic principle of control system design that has been known for as long as modern day control systems have existed. (*See id.* at ¶ 48.) Feedback enables closed-loop control of a system. Closed-loop systems are routinely used in the medical industry because they provide important information about the operation and functioning of medical devices. (*See id.*) Microprocessor controllers, translators, feedback data, and networked medical devices, the key claimed elements of the ‘657 patent, were thus well known long before the alleged invention of the ‘657 patent.

V. ELEMENT-BY-ELEMENT ANALYSIS OF HOW CHALLENGED CLAIMS ARE UNPATENTABLE (37 C.F.R. §§42.104)

There is a reasonable likelihood that claims 21, 22, 28-31, 35, 61, 62, 68-71, and 75 are unpatentable as anticipated or rendered obvious in view of the prior art.

A. Ground 1: Claims 21, 22, 28-31, 35, 61, 62, 68-71, And 75 Are Anticipated Under 35 U.S.C. § 102(e) By Ghodoussi

Claims 21, 22, 28-31, 35, 61, 62, 68-71, and 75 are anticipated under 35 U.S.C. § 102(e) by Ghodoussi.

(i) Independent claims 21 and 61:

Independent claims 21 and 61 feature similar elements and will be addressed together. To the extent the preamble is limiting, Ghodoussi discloses a "system which controls ancillary medical devices," as recited by claim 21, and a "method for controlling ancillary medical devices," as recited by claim 61. (Ex. 1003, Ghodoussi at Fig. 7; *see also id.* at 1:14 ("The present invention relates to a medical robotic system."), 2:18-23; Ex. 1008, Walbrink Decl. at ¶ 55.)

Each element of claims 21 and 61 is found in Ghodoussi. ***<u>First</u>***, Ghodoussi discloses "***a surgical network***," as recited by claim 21, and "***providing a surgical network***," as recited by claim 61. Ghodoussi discloses a "*surgical network*" amongst the "mentor control unit" (MCU) 50, "the pupil control unit" (PCU) 52, the "input devices" 56, the "interconnect devices" 142 and 144, and the "network computer 140," as shown in Fig. 7. (Ex. 1003, Ghodoussi at Fig. 7.) "FIG. 7 depicts the MCU 50 and PCU 52 coupled to the articulate arms 16, 18, 20, 22 and 28 by a network port 140 and a pair of interconnect devices 142 and 144. The network port 140 may be a computer that contains the necessary hardware and software to transmit and receive information through a communication link 146 in a communication network 148." (*Id.* at 6:21-29.) Ghodoussi explains that "[d]ata transmitted between the computer 140 and the various components within the surgeon side of the system may be communicated through a protocol provided by Computer Motion under the name HERMES NETWORK PROTOCOL (HNP)." (*Id.* at 8:49-56; Ex. 1008, Walbrink Decl. at ¶ 55.)

Second, Ghodoussi discloses "***an input device, connected to said surgical network, which inputs a medical command***," as recited by claim 21, and "***entering a medical command into the surgical network***," as recited by claim 61. Ghodoussi discloses "a tele-medicine system that includes an input device which can control a medical system. The input device may be the handle of a surgical console." (Ex. 1003, Ghodoussi at 2:54-56 (emphasis added).) "The handle assemblies 56 and articulate arms 16, 18, 20 and 22 have a master-slave relationship so that movement of the handles 56 produces a corresponding movement of the surgical instruments 26, 28, 30 and/or 32. The controller 54 receives input signals from the handle assemblies 56 of each control unit 50 and 52, computes a corresponding movement of the surgical instruments 26, 28, 30 and 32, and provides output signals to move the robotic arms 34, 36, 38 and 40 and instruments 26, 28, 30 and 32." (*Id.* at 3:52-60 (emphasis added); *see also id.* at 5:60-65; Ex. 1008, Walbrink Decl. at ¶ 55.)

Third, Ghodoussi discloses "***a controller, connected to said surgical network, which receives the medical command and generates corresponding medical command data***," as recited by claim 21, and "***generating corresponding medical command data***," as recited by claim 61. Ghodoussi explains that "[t]he controller 54 receives input signals from the handle assemblies 56 of each control unit 50 and 52, computes a corresponding movement of the surgical instruments 26, 28, 30 and 32, and provides output signals to move the robotic arms 34, 36, 38 and 40 and instruments 26, 28, 30 and 32." (Ex. 1003, Ghodoussi at 3:55-60 (emphasis added).) Ghodoussi further discloses that "[t]he controller 54 performs a series of computations to determine a corresponding movement of the medical instrument 26, 28, 30, or 32. The computations may include one or more transformation and kinematic equations. The controller 54 provides output signals to the corresponding robotic arm to move the instrument 26, 28, 30 or 32 . . . ." (*Id*. at 4:44-51 (emphasis added); Ex. 1008, Walbrink Decl. at ¶ 55.)

Fourth, Ghodoussi discloses "***a translator, connected to said surgical network, which receives the medical command data via said surgical network and translates the medical command data***," as recited by claim 21. Ghodoussi also discloses the following similar elements, as recited by claim 61: "***communicating the medical command data via the surgical network***" and "***translating the medical command data***." Ghodoussi explains that "control units

50 and 52 may provide output signals and commands that are incompatible with a computer. <u>The interconnect devices 142 and 144 may provide an interface that conditions the signals for transmitting and receiving signals between the control units 50 and 52 and the network computer 140</u>." (Ex. 1003, Ghodoussi at 6:28-34 (emphasis added); *see also id.* at Fig. 7.) Moreover, "[t]he network port 140 may be a computer that contains the necessary hardware and software to transmit and receive information through a communication link 146 in a communication network 148." (*Id.* at 6:23-27.) Ghodoussi further explains that "[t]he computer 140 . . . may be constructed so that the system does not require the interconnect devices 142 and 144." (*Id.* at 6:35-37.) Accordingly, Ghodoussi discloses that network computer 140 alone can provide both the claimed translation function performed by interconnect devices 142 and 144, as well as a communication function. (Ex. 1008, Walbrink Decl. at ¶ 55.) Ghodoussi thus discloses that the "*medical command data*" is communicated from control units 50 and 52 via the "*surgical network*" to interconnect devices 142 and 144 and network computer 140, which together "*translate*" the data for communication across the ancillary network. (*See id.*)

<u>Fifth</u>, Ghodoussi discloses "***at least one ancillary medical device not connectable to said surgical network, in communication with said translator via an ancillary network, which receives the translated medical command data and***

carries out the corresponding medical command," as recited by claim 21. Ghodoussi also discloses the following similar elements recited by claim 61: "***communicating the translated medical command data to an ancillary medical device that is not connectable to the surgical network***" and "***executing the corresponding medical command with the ancillary medical device***."

Ghodoussi teaches that "[t]he system 10 can be used to perform a procedure on a patient 12 that is typically lying on an operating table 14. Mounted to the operating table 14 is a first articulate arm 16, a second articulate arm 18, a third articulate arm 20, a fourth articulate arm 22 and a fifth articulate arm 24 which may also be referred to as medical devices. . . . <u>The first 16, second 18, third 20 and fourth 22 articulate arms may each have a surgical instrument 26, 28, 30 and 32, respectively, coupled to robotic arms 34, 36, 38 and 40, respectively. The fifth articulate arm 24 includes a robotic arm 42 that holds and moves an endoscope 44</u>." Articulate arms 16, 18, 20, 22, and 24 and surgical instruments 26, 28, 30, 32, and endoscope 44, constitute "*ancillary medical devices*" that communicate via an "*ancillary network*," namely network 148, as shown in Figure 7. (Ex. 1003, Ghodoussi at 3:7-21 (emphasis added); *see also id.* at Fig. 7; Ex. 1008, Walbrink Decl. at ¶ 55.)

Ghodoussi discloses that these "*ancillary medical devices*" receive "*translated medical command*" data from interconnect devices 142 and 144 and network computer 140 (which collectively comprise the "*translator*") and carry out the corresponding medical command, as follows: "The handle assemblies 56 and articulate arms 16, 18, 20 and 22 have a master-slave relationship so that movement of the handles 56 produces a corresponding movement of the surgical instruments 26, 28, 30 and/or 32. The controller 54 receives input signals from the handle assemblies 56 of each control unit 50 and 52, computes a corresponding movement of the surgical instruments 26, 28, 30 and 32, and provides output signals to move the robotic arms 34, 36, 38 and 40 and instruments 26, 28, 30 and 32." (*Id.* at 3:52-60 (emphasis added); *see also id.* at claim 1 (reciting "a medical system that . . . changes states in response to the received information related to each state of said input device"); Ex. 1008, Walbrink Decl. at ¶ 55.)

As discussed above, "[t]he control units 50 and 52 may provide output signals and commands that are incompatible with a computer. The interconnect devices 142 and 144 may provide an interface that conditions the signals for transmitting and receiving signals between the control units 50 and 52 and the network computer 140," where network computer 140 can also be constructed so that interconnect devices 142 and 144 are not needed. (*Id.* at 6:23-37.)) Because the output signals from control units 50 and 52 cannot be communicated to the articulate arms and surgical instruments absent the use of the interconnect devices 142 and 144 and network computer 140, these "*ancillary medical devices*" are not connectable to the surgical network. (*See* Ex. 1008, Walbrink Decl. at ¶ 55.) In other words, the output of control units 50 and 52 must be translated through interconnect devices 142 and 144 and network computer 140 before it can be processed by the ancillary medical devices. (*See id.*)

Sixth, Ghodoussi discloses "***feedback data generated by said at least one ancillary medical device and communicated to said translator via said ancillary network***," as recited by claim 21. Ghodoussi also discloses the following similar elements recited by claim 61: "***generating feedback data with the ancillary medical device***," "***communicating the feedback data via an ancillary network***," and "***translating the feedback data***." Ghodoussi describes that "[t]he robotic arms and instruments [i.e., the "*ancillary medical devices*"] contain sensors, encoders, etc. that provide feedback information including force and position data. Some or all of this feedback information may be transmitted over the network 148 [i.e., the "*ancillary network*"] to the surgeon side of the system [i.e., the "*surgical network.*"]" (Ex. 1003, Ghodoussi at 8:10-14 (emphasis added); *see also id.* at 8:59-56, 12:21-24, 12:38-40, Fig. 7; Ex. 1008, Walbrink Decl. at ¶ 55.)

Ghodoussi discloses that the feedback information passes through network computer 140 and interconnect devices 142 and 144 (which collectively comprise the "*translator*") before reaching the surgical network. (Ex. 1003, Ghodoussi at 8:10-14.) Figure 7 of Ghodoussi expressly depicts bidirectional arrows moving to and from network computer 140 and interconnect devices 142 and 144, which teaches that information must be translated before it passes from the ancillary network to the surgical network, and vice versa. (*See id.* at Fig. 7; *see also id.* at 6:24-28 ("The network computer 140 may be a computer that contains the necessary hardware and software to transmit and receive information through a communication link 146 in a communication network 148." (emphasis added); Ex. 1008, Walbrink Decl. at ¶ 55.)

Seventh and finally, Ghodoussi discloses "***communicating the translated feedback data to the surgical network***," as recited by claim 61. Ghodoussi states that "[s]ome or all of this feedback information may be transmitted over the network 148 to the surgeon side of the system [i.e., the "*surgical network*"]." (Ex. 1003, Ghodoussi at 8:10-14 (emphasis added); *see also id.* at 8:59-65.) Ghodoussi also explains that "it is desirable to transmit the entire state of the mentor control unit to the robotic arms and transmit the entire state of the robotic arms to the mentor control station," where the mentor control unit 50 is within the "*surgical network*" and robotic arms 34, 36, 38 and 40 are within the "*ancillary network*." (*Id*. at 12:21-24 (emphasis added); Ex. 1008, Walbrink Decl. at ¶ 55.)

Turning to the dependent claims, Ghodoussi discloses the limitations of dependent claims 22, 28-31, 35, 62, 68-71, and 75 as discussed below. Due to substantial overlap, certain claims are addressed together below.

(ii) Claim 22:

Ghodoussi discloses that "***said input device is connected to said controller***." In particular, Ghodoussi states that "[t]he controller 54 receives input signals from the handle assemblies 56 [i.e., the "*input device*"] of each control unit 50 and 52 . . . ." (Ex. 1003, Ghodoussi at 3:55-56; Ex. 1008, Walbrink Decl. at ¶ 56.)

(iii) Claim 62:

Ghodoussi discloses that "***the medical command is entered with an input device that is connected to a controller that generates the corresponding medical command data***." Ghodoussi teaches that "[t]he handle assemblies 56 and articulate arms 16, 18, 20 and 22 have a master-slave relationship so that movement of the handles 56 produces a corresponding movement of the surgical instruments 26, 28, 30 and/or 32. The controller 54 receives input signals from the handle assemblies 56 of each control unit 50 and 52, computes a corresponding movement of the surgical instruments 26, 28, 30 and 32, and provides output signals to move the robotic arms 34, 36, 38 and 40 and instruments 26, 28, 30 and 32." (Ex. 1003, Ghodoussi at 3:52-60 (emphasis added); *see also id.* at 4:44-51; Ex. 1008, Walbrink Decl. at ¶ 57.)

(iv) Claims 28, 68:

Ghodoussi discloses that the "***surgical network comprises an Ethernet***." Ghodoussi teaches that "computers 140 and 150 may be constructed and configured to operate with 100-base T Ethernet and/or 155 Mbps fiber ATM systems." (Ex. 1003, Ghodoussi at 6:53-7:8 (emphasis added); *see also id.* at 6:58-65.) Ghodoussi thus discloses that the surgical network, which includes network computer 140, communicates using Ethernet. (Ex. 1008, Walbrink Decl. at ¶ 58.)

(v) Claims 29, 69:

Ghodoussi discloses "***an ancillary controller [is] connected to [said/the] ancillary network***." Ghodoussi explains that "[t]he system 10 may include a second network port 150 that is coupled to a robot/device controller(s) 152 and the communication network 148. The device controller controls the articulate arms 16, 18, 20, 22 and 24." (Ex. 1003, Ghodoussi at 6:43-47 (emphasis added); *see id.* at Fig. 7 (ref. no. 152).) "The controller 152 may include three separate controllers 168, 170 and 172. The controller 168 may receive input commands, perform kinematic computations based on the commands, and drive output signals to move the robotic arms 34, 36, 38 and 40 and accompanying instruments 26, 28, 30 and 32 to a desired position." (*Id.* at 7:56-62.) As shown in Fig. 7, controller 152 is connected to the ancillary network on the patient side of the system. (*Id.* at Fig. 7; Ex. 1008, Walbrink Decl. at ¶ 59.)

(vi) Claims 30, 70:

Ghodoussi discloses that "***said ancillary network includes an ancillary input device***" (claim 30) and that "***an ancillary input device is connected to the ancillary network***" (claim 70). Ghodoussi explains that "[t]he robotic arms and instruments [i.e., "*ancillary medical devices*"] contain sensors, encoders, etc. that provide feedback information including force and position data. Some or all of this feedback information may be transmitted over the network 148 [i.e., the "*ancillary network*"] to the surgeon side of the system." (Ex. 1003, Ghodoussi at 8:10-14 (emphasis added); *see also id.* at 8:59-65, 12:21-24, 12:38-40.) The robotic arms and instruments, which are within the "*ancillary network*" on the patient side of the system, thus serve as input devices, providing input data (i.e., force and position data) to controller 152. This is supported by the bidirectional arrows moving to and from controller 152 and ancillary medical devices 16, 18, 20, 22, and 24 in Figure 7. (*See id.* at Fig. 7; Ex. 1008, Walbrink Decl. at ¶ 60.)

(vii) Claims 31, 71:

Ghodoussi discloses that the "***ancillary input device is connected to [said/the] ancillary controller***." Ghodoussi discloses that "device controller 152 [i.e., the "*ancillary controller*"] controls the articulate arms 16, 18, 20, 22 and 24." (Ex. 1003, Ghodoussi at 6:45-46 (emphasis added); *see also id.* at 3:20-26, Fig. 7.) Accordingly, the articulate arms 16, 18, 20, 22, and 24—which constitute "*ancillary input device(s)*," as described above—are connected to the ancillary controller. (*See id.*; Ex. 1008, Walbrink Decl. at ¶ 61.)

(viii) Claims 35, 75:

Ghodoussi discloses that the "***ancillary network includes a self-configuring bus***." Ghodoussi describes the following "start-up routine" performed by the system: "The consoles may not be in communication during the start-up routine of the robotic arms, instruments, etc. therefore the system does not have the console data required for system boot. The computer 150 may automatically drive the missing console input data to default values. The default values allow the patient side of the system to complete the start-up routine. . . . Driving missing signals to a default value may be part of a network local mode. The local mode allows one or more consoles to 'hot plug' into the system without shutting the system down." (Ex. 1003, Ghodoussi at 9:59-10:11 (emphasis added).) This routine enables the system to automatically self-configure. In particular, a person of ordinary skill would recognize that "hot plug[ging]," as disclosed in Ghodoussi, refers to a self-configuring routine whereby devices can be connected to the network and automatically configured for use. (Ex. 1008, Walbrink Decl. at ¶ 62.)

Moreover, Ghodoussi discloses that the ancillary medical devices are interconnected via a bus. In particular, Fig. 7 depicts that at least ancillary medical devices 18, 20, and 22 are connected to ancillary controller 152 by a single, central communication line, which would denote a "***bus***" to a person of ordinary skill in the art. (*See id.*; Ex. 1003, Ghodoussi at Fig. 7.)

Claim Charts: The below claim charts contain detailed citation to disclosure in Ghodoussi that anticipates each of the claims 21, 22, 28-31, 35, 61, 62, 68-71, and 75 of the '657 patent. Due to substantial overlap, certain claims are addressed together in a single chart below.

Claims 21, 61	Ghodoussi
(21) A system which controls ancillary medical devices, comprising: *(61) A method for controlling ancillary medical devices, the method comprising:*	"The present invention relates to a medical robotic system." (Ex. 1003, Ghodoussi at 1:14; *see also id.* at 2:18-23, Figs. 1, 7; Ex. 1008, Walbrink Decl. at ¶ 55.)
(21) a surgical network; *(61) providing a surgical network;*	"FIG. 7 depicts the MCU 50 and PCU 52 coupled to the articulate arms 16, 18, 20, 22 and 28 by a network port 140 and a pair of interconnect devices 142 and 144. The network port 140 may be a computer that contains the necessary hardware and software to transmit and receive information through a communication link 146 in a communication network148." (Ex. 1003, Ghodoussi at 6:21-29.) "Data transmitted between the computer 140 and the various components within the surgeon side of the system may be communicated through a protocol provided by Computer Motion under the name HERMES NETWORK PROTOCOL (HNP)." (*Id.* at 8:49-56; Ex. 1008, Walbrink Decl. at ¶ 55.)
(21) an input device, connected to said surgical network, which inputs a medical command; *(61) entering a medical command into the surgical network;*	"Disclosed is a tele-medicine system that includes an input device which can control a medical system. The input device may be the handle of a surgical console." (Ex. 1003, Ghodoussi at 2:54-56.) "The handle assemblies 56 and articulate arms 16, 18, 20 and 22 have a master-slave relationship so that movement of the handles 56 produces a corresponding movement of the surgical instruments 26, 28, 30 and/or 32. The controller 54 receives input signals from the handle assemblies 56 of each control unit 50 and 52, computes a corresponding movement of the surgical instruments 26, 28, 30 and 32, and provides output signals to move the robotic arms 34, 36, 38 and 40 and instruments 26, 28, 30 and 32."

	(*Id.* at 3:52-60; *see also id.* at 5:60-65, Fig. 7; Ex. 1008, Walbrink Decl. at ¶ 55.)
(21) a controller, connected to said surgical network, which receives the medical command and generates corresponding medical command data; *(61) generating corresponding medical command data;*	"The controller 54 receives input signals from the handle assemblies 56 of each control unit 50 and 52, computes a corresponding movement of the surgical instruments 26, 28, 30 and 32, and provides output signals to move the robotic arms 34, 36, 38 and 40 and instruments 26, 28, 30 and 32." (Ex. 1003, Ghodoussi at 3:55-60 (emphasis added); *see also id.* at 4:1-8, 4:44-51; Ex. 1008, Walbrink Decl. at ¶ 55.)
(21) a translator, connected to said surgical network, which receives the medical command data via said surgical network and translates the medical command data; *(61) communicating the medical command data via the surgical network;* *(61) translating the medical command data;*	"[C]ontrol units 50 and 52 may provide output signals and commands that are incompatible with a computer. The interconnect devices 142 and 144 may provide an interface that conditions the signals for transmitting and receiving signals between the control units 50 and 52 and the network computer 140." (Ex. 1003, Ghodoussi at 6:28-34 (emphasis added); *see also id.* at Fig. 7.) "The network port 140 may be a computer that contains the necessary hardware and software to transmit and receive information through a communication link 146 in a communication network 148." (*Id.* at 6:23-27.) "[T]he computer 140 . . . may be constructed so that the system does not require the interconnect devices 142 and 144." (*Id.* at 6:35-37; Ex. 1008, Walbrink Decl. at ¶ 55.)
(21) at least one ancillary medical device not connectable to said surgical network, in communication with said translator via an ancillary network, which receives the translated medical command data and carries out the corresponding medical	"The system 10 can be used to perform a procedure on a patient 12 that is typically lying on an operating table 14. Mounted to the operating table 14 is a first articulate arm 16, a second articulate arm 18, a third articulate arm 20, a fourth articulate arm 22 and a fifth articulate arm 24 which may also be referred to as medical devices. . . . The first 16, second 18, third 20 and fourth 22 articulate arms may each have a surgical instrument 26, 28, 30 and 32, respectively, coupled to robotic arms 34, 36, 38 and 40, respectively. The fifth articulate arm 24 includes a

command; and *(61) communicating the translated medical command data to an ancillary medical device that is not connectable to the surgical network;* *(61) executing the corresponding medical command with the ancillary medical device;*	robotic arm 42 that holds and moves an endoscope 44." (Ex. 1003, Ghodoussi at 3:7-21 (emphasis added), Fig. 7 ("Network" 148).) "The handle assemblies 56 and articulate arms 16, 18, 20 and 22 have a master-slave relationship so that movement of the handles 56 produces a corresponding movement of the surgical instruments 26, 28, 30 and/or 32. The controller 54 receives input signals from the handle assemblies 56 of each control unit 50 and 52, computes a corresponding movement of the surgical instruments 26, 28, 30 and 32, and provides output signals to move the robotic arms 34, 36, 38 and 40 and instruments 26, 28, 30 and 32." (*Id.* at 3:52-60 (emphasis added); *see also id.* at claim 1.) "The control units 50 and 52 may provide output signals and commands that are incompatible with a computer. The interconnect devices 142 and 144 may provide an interface that conditions the signals for transmitting and receiving signals between the control units 50 and 52 and the network computer 140," where network computer 140 can also be constructed so that interconnect devices 142 and 144 are not needed. (*Id.* at 6:28-37; Ex. 1008, Walbrink Decl. at ¶ 55.)
(21) feedback data generated by said at least one ancillary medical device and communicated to said translator via said ancillary network. *(61) generating feedback data with the ancillary medical device;* *(61) communicating the feedback data via an ancillary network;* *(61) translating the*	"The robotic arms and instruments contain sensors, encoders, etc. that provide feedback information including force and position data. Some or all of this feedback information may be transmitted over the network 148 to the surgeon side of the system." (Ex. 1003, Ghodoussi at 8:10-14 (emphasis added); *see also id.* at 8:59-65, 12:21-24, 12:38-40, Fig. 7.) "[I]t is desirable to transmit the entire state of the mentor control unit to the robotic arms and transmit the entire state of the robotic arms to the mentor control station." (*Id.* at 12:21-24; Ex. 1008, Walbrink Decl. at ¶ 55.)

feedback data;	
(61) communicating the translated feedback data to the surgical network.	"The robotic arms and instruments contain sensors, encoders, etc. that provide feedback information including force and position data. Some or all of this feedback information may be transmitted over the network 148 to the surgeon side of the system." (Ex. 1003, Ghodoussi at 8:10-14 (emphasis added).) "In addition to the robotic and non-robotic data, the patient side of the system will transmit video data from the endoscope camera 46. To reduce latency in the system, the video data can be multiplexed with the robotic/other data onto the communications network. The video data may be compressed using conventional MPEG, MPEG2, etc. compression techniques for transmission to the surgical side of the system." (*Id.* at 8:59-65 (emphasis added).) "[I]t is desirable to transmit the entire state of the mentor control unit to the robotic arms and transmit the entire state of the robotic arms to the mentor control station." (*Id.* at 12:21-24 (emphasis added); Ex. 1008, Walbrink Decl. at ¶ 55.)
Claim 22	**Ghodoussi**
22. The system of claim 21, wherein said input device is connected to said controller.	Ghodoussi discloses all the elements of claim 21, as discussed above. The analysis of claim 21 is incorporated by reference in its entirety. "The controller 54 receives input signals from the handle assemblies 56 of each control unit 50 and 52 . . . ." (Ex. 1003, Ghodoussi at 3:55-56; *see also id.* at Figs. 1, 2, 7; Ex. 1008, Walbrink Decl. at ¶ 56.)
Claim 62	**Ghodoussi**
62. The method of claim 61, wherein the medical command is entered with an input device that is connected to a controller that generates the corresponding medical command data.	Ghodoussi discloses all the elements of claim 61, as discussed above. The analysis of claim 61 is incorporated by reference in its entirety. "The handle assemblies 56 and articulate arms 16, 18, 20 and 22 have a master-slave relationship so that movement of the handles 56 produces a corresponding movement of the surgical instruments 26, 28, 30 and/or 32. The controller 54 receives input

	signals from the handle assemblies 56 of each control unit 50 and 52, computes a corresponding movement of the surgical instruments 26, 28, 30 and 32, and provides output signals to move the robotic arms 34, 36, 38 and 40 and instruments 26, 28, 30 and 32." (*Id.* at 3:52-60; *see also id.* at 2:54-56, Fig. 7; Ex. 1008, Walbrink Decl. at ¶ 57.)
Claims 28, 68	**Ghodoussi**
(28) The system of claim 21, wherein said surgical network comprises an Ethernet. *(68) The method of claim 61, wherein the surgical network comprises an Ethernet.*	Ghodoussi discloses all the elements of claims 21 and 61, as discussed above. The analyses of claims 21 and 61 are incorporated by reference in their entirety. "By way of example, the computers 140 and 150 may be constructed and configured to operate with 100-base T Ethernet and/or 155 Mbps fiber ATM systems." (Ex. 1003, Ghodoussi at 6:53-7:8; *see also id.* at 6:58-65; Ex. 1008, Walbrink Decl. at ¶ 58.)
Claims 29, 69	**Ghodoussi**
(29) The system of claim 21, further comprising an ancillary controller connected to said ancillary network. *(69) The method of claim 61, wherein an ancillary controller is connected to the ancillary network.*	Ghodoussi discloses all the elements of claims 21 and 61, as discussed above. The analyses of claims 21 and 61 are incorporated by reference in their entirety. "The system 10 may include a second network port 150 that is coupled to <u>a robot/device controller(s) 152</u> and the communication network 148. <u>The device controller controls the articulate arms 16, 18, 20, 22 and 24</u>." (Ex. 1003, Ghodoussi at 6:43-47 (emphasis added), 7:56-62, Fig. 7; Ex. 1008, Walbrink Decl. at ¶ 59.)
Claims 30, 70	**Ghodoussi**
(30) The system of claim 29, wherein said ancillary network includes an ancillary input device. *(70) The method of claim 69, wherein an ancillary input device is connected*	Ghodoussi discloses all the elements of claims 29 and 69, as discussed above. The analyses of claims 29 and 69 are incorporated by reference in their entirety. "The robotic arms and instruments contain sensors, encoders, etc. that provide feedback information including force and position data. Some or all of this feedback information may be transmitted over the network 148 to the surgeon side of the system." (Ex.

to the ancillary network.	1003, Ghodoussi at 8:10-14; *see also id.* at 8:59-65, 12:21-24, 12:38-40, Fig. 7; Ex. 1008, Walbrink Decl. at ¶ 60.)
Claims 31, 71	**Ghodoussi**
(31) The system of claim 30, wherein said ancillary input device is connected to said ancillary controller. *(71) The method of claim 70, wherein the ancillary input device is connected to the ancillary controller.*	Ghodoussi discloses all the elements of claims 30 and 70, as discussed above. The analyses of claims 30 and 70 are incorporated by reference in their entirety. "[D]evice controller 152 controls the articulate arms 16, 18, 20, 22 and 24." (Ex. 1003, Ghodoussi at 6:45-46 (emphasis added), 3:20-26; *see also id.* at Fig. 7; Ex. 1008, Walbrink Decl. at ¶ 61.)
Claims 35, 75	**Ghodoussi**
(35) The system of claim 21, wherein said ancillary network includes a self-configuring bus. *(75) The method of claim 61, wherein the ancillary network includes a self-configuring bus.*	Ghodoussi discloses all the elements of claims 21 and 61, as discussed above. The analyses of claims 21 and 61 are incorporated by reference in their entirety. "The computer 150 may automatically drive the missing console input data to default values. The default values allow the patient side of the system to complete the start-up routine. . . . Driving missing signals to a default value may be part of a network local mode. The local mode allows one or more consoles to 'hot plug' into the system without shutting the system down." (Ex. 1003, Ghodoussi at 9:59-10:11; *see also id.* at Fig. 7; Ex. 1008, Walbrink Decl. at ¶ 62.)

B. Ground 2: Claims 28 And 68 Are Rendered Obvious Under 35 U.S.C. § 103(a) In View Of Ghodoussi And Webb

To the extent the Board determines that Ghodoussi does not expressly or inherently disclose all of the limitations of claims 28 and 68, those limitations can also easily and obviously be found in Webb. Webb discloses a medical communication system that enables a remotely-located clinician to participate in and provide advice during a surgical procedure being performed at a different location. (*See* Ex. 1005, Webb at Abstract, ¶¶ 0003, 0017; Ex. 1008, Walbrink Decl. at ¶¶ 63-64.) Webb discloses that the medical devices located at the first location may be coupled to a communications network via an Ethernet connection. (*See* Ex. 1005, Webb at ¶¶ 0042, 0045; Ex. 1008, Walbrink Decl. at ¶ 66.)

It would have been obvious to one of ordinary skill in the art at the time of the alleged invention of the '657 patent to combine the Ethernet network disclosed in Webb with the surgical network of Ghodoussi. (Ex. 1008, Walbrink Decl. at ¶¶ 67-77.) At that time, Ethernet was a ubiquitous, standardized, reliable, high-quality, low-cost, and robust type of network. (*See id.* at ¶¶ 69-73) One of ordinary skill would have recognized that Ethernet would provide the reliability and efficiency, as well as the cost efficiency, needed in a medical device control system. (*See id.*)

The combination of the Ethernet network of Webb with the surgical network of Ghodoussi would also have been obvious because it involves only the predictable use of prior art elements according to their established functions. (*See id.* at ¶ 74.) Webb shows that, at the time of the alleged invention of the '657 patent, it was already known to use Ethernet connections to link medical devices in networked systems. (*See id.* at ¶¶ 0042, 0045.) Ghodoussi itself discloses that "computers 140 and 150 may be constructed and configured to operate with 100-base T Ethernet and/or 155 Mbps fiber ATM systems." (Ex. 1003, Ghodoussi at 7:3-8.) A person of ordinary skill would have known how to establish an Ethernet connection among the devices within the surgical network of Ghodoussi because this would involve nothing more than connecting commercially available components, such as an Ethernet interface card, Ethernet cabling, and an Ethernet switch. (Ex. 1008, Walbrink Decl. at ¶ 74.) Once connected via an Ethernet connection, the devices within the surgical network of Ghodoussi would communicate with each other in the same way as they would if any other network connection were used between them. (*See id.*) Moreover, there would be nothing unique about the Ethernet connection between these devices; it would be a standard, predictable Ethernet connection. (*See id.*)

Finally, the combination of the Ethernet network of Webb with the surgical network of Ghodoussi would also have been obvious at the time of the alleged invention of the '657 patent because it results from the use of a known technique to improve a similar system in the same way. (*See id.* at ¶ 75.) Ghodoussi discloses a "tele-medicine system that includes an input device coupled to a medical system by a network. An input device transmitter transmits information regarding a state of the input device through the network." (Ex. 1003, Ghodoussi at 2:18-23.) Similarly, Webb discloses a system that "allow[s] medical data obtained at a local site to be transferred to a data processing system located at a remote site" through a network. (Ex. 1005, Webb at Abstract, ¶ 0039.) As described above, Ethernet was known to have many advantages prior to the alleged invention of the '657 patent. (Ex. 1008, Walbrink Decl. at ¶¶ 69-73.) Accordingly, if the Ghodoussi system did not already use an Ethernet as the surgical network, using Ethernet instead could be viewed as an improvement in light of these advantages. (*See id.* at ¶ 75.) A person of ordinary skill would have known how to use Ethernet as the surgical network in Ghodoussi because this would involve nothing more than connecting commercially available components. (*See id.*) A person of ordinary skill would have known how to improve the Ghodoussi system by using Ethernet, as disclosed in Webb, as the surgical network of Ghodoussi. (*See id.*) Petitioner is not aware of any secondary considerations that would tend to show that this combination is non-obviousness—particularly any secondary considerations having a nexus to the claimed inventions. (*See id.* at ¶ 77.)

Claim Charts: The below claim chart contains detailed citation to disclosure in Ghodoussi and Webb, the combination of which renders obvious claims 28 and 68 of the '657 patent.

Claims 28, 68	Ghodoussi in Combination with Webb
(28) The system of claim 21, wherein said surgical network comprises an Ethernet.	Ghodoussi discloses all the elements of claims 21 and 61, as discussed above. The analyses of claims 21 and 61 are incorporated by reference in their entirety. *See above* at claims 28 and 68 (§ V.A.iv) for the description of the Ethernet disclosed in Ghodoussi.

(68) The method of claim 61, wherein the surgical network comprises an Ethernet.	That analysis is incorporated by reference in its entirety. "Yet other types of medical devices may interface to communications network 6. . . . Such signals may be transferred over various network connections that include Ethernet or infrared connections." (Ex. 1005, Webb at ¶ 0042; *see also id.* at Abstract, ¶¶ 0003, 0045; Ex. 1008, Walbrink Decl. at ¶¶ 63-77.)

C. Ground 3: Claims 35 And 75 Are Rendered Obvious Under 35 U.S.C. §103(a) In View Of Ghodoussi In Combination With Nazarian

To the extent the Board determines that Ghodoussi does not expressly or inherently disclose all the limitations of claims 35 and 75, those limitations can also easily and obviously be found in Nazarian. Nazarian discloses a medical perfusion system for use in connection with the medical treatment of a patient that comprises a main controller, a plurality of perfusion devices, and a data communications network for interconnecting the perfusion devices. (Ex. 1006, Nazarian at Abstract, 1:31-47.) In one embodiment of Nazarian, the main controller comprises a conventional network controller such as a Controller Area Network ("CAN"), which oversees data flow on the network buses. (*Id.* at 8:58-63.) As described in the '657 patent, CAN networks are self-configuring networks. (*See* Ex. 1001, '657 patent at 1:28-48, 4:46-60, claims 6, 7.) Nazarian further discloses that the main controller may employ a plug-in procedure that allows for automatic configuration of perfusion devices that are subsequently connected to the system. (Ex. 1006, Nazarian at 8:9-23; *see also id.* at Figs. 13A, 13B; Ex. 1008, Walbrink Decl. at ¶¶ 79-81.)

At the time of the alleged invention of the ‘657 patent, it would have been obvious to a person of ordinary skill in the art to combine the self-configuring bus of Nazarian and the ancillary network of Ghodoussi because it was well known that self-configuring buses provided many advantages when used in medical control systems. (Ex. 1008, Walbrink Decl. at ¶¶ 82-84.) For instance, self-configuring buses were known to enable users to dynamically connect and disconnect devices within the control system without having to reprogram or manually reconfigure the system. (*See id.* at ¶ 84.) This is particularly useful for medical practitioners who must often quickly ready the operating room between procedures that require distinct medical devices. (*See id.*) In short, prior to the alleged invention of the ‘657 patent, self-configuring buses were known to provide surgeons with the flexibility to connect, disconnect, and interchange surgical instruments at will. (*See id.*)

Nazarian also includes the following teaching, suggestion or motivation that would lead a person of ordinary skill in the art to use a self-configuring bus as the ancillary network in Ghodoussi: “[An] operator may configure a centrifugal blood pump (not yet connected to the main controller 20) to operate in a continuous mode to continuously pump a predetermined flow. When the blood pump is subsequently connected to the controller 20, the controller 20 will then automatically match the previously stored pump configuration with the pump." (Ex. 1006, Nazarian at 8:17-23.) Nazarian thus suggests that a self-configuring bus beneficially enables doctors to reconfigure medical control systems on-the-fly during a medical procedure, without having to interrupt or delay the procedure to disconnect existing devices or connect new devices to the system. (Ex. 1008, Walbrink Decl. at ¶ 85.) Although self-configuring buses are not necessarily interchangeable with other types of buses, a person of ordinary skill would have known how to reconfigure the medical device control system of Ghodoussi to include a self-configuring bus as the ancillary network. (*See id.* at ¶ 86.) This would simply have been a question of hardware design and would involve only the routine application of prior-art bus technology. (*See id.*)

The combination of the self-configuring bus of Nazarian with the ancillary network of Ghodoussi would also have been obvious because it involves only the predictable use of prior art elements according to their established functions. (*See id.* at ¶ 87.) Nazarian shows that, at the time of the alleged invention of the '657 patent, it was already known to use self-configuring buses, such as CAN buses, in medical control systems. (*See id.*) Notably, the CAN protocol was officially released as a standard by the International Standards Organization in 1993, long before the alleged invention of the '657 patent. (*See id.* at ¶ 89.) Like Ghodoussi, Nazarian discloses a medical control system, specifically a medical perfusion system for use in connection with the medical treatment of a patient that comprises a main controller, a plurality of perfusion devices, and a data communications network for interconnecting the perfusion devices. (Ex. 1006, Nazarian at Abstract, 1:31-47.) A person of ordinary skill at the time of the alleged invention would have known how to reconfigure the medical device control system of Ghodoussi to include a self-configuring bus, like that disclosed in Nazarian, as the ancillary network. (*See* Ex. 1008, Walbrink Decl. at ¶ 88.) Once Ghodoussi were reconfigured to accommodate a self-configuring bus like that of Nazarian, the bus would function the same as it did in Nazarian. (*See id.*)

Finally, the combination of the self-configuring bus disclosed in Nazarian with the ancillary network of Ghodoussi would also have been obvious because it results from the use of a known technique to improve a similar system in the same way. (*See id.* at ¶ 90.) The systems disclosed in Ghodoussi and Nazarian both include multiple controlled medical devices. As described above, self-configuring buses were known to have many advantages in medical applications prior to the time of the alleged invention of the '657 patent. (*See id.*) Accordingly, using a self-configuring bus as the ancillary network of Ghodoussi could be viewed as an improvement to the system in light of these advantages. (*See id.*) A person of ordinary skill would have known how to improve the Ghodoussi system by installing a self-configuring bus as the ancillary network therein. (*See id*.) Petitioner is not aware of any secondary considerations that would tend to show that this combination is non-obviousness—particularly any secondary considerations having a nexus to the claimed inventions. (*See id.* at ¶ 92.)

Claim Charts: The below claim chart contains detailed citation to disclosure in Ghodoussi and Nazarian, the combination of which renders obvious claims 35 and 75 of the '657 patent.

Claims 35, 75	Ghodoussi in Combination with Nazarian
(35) The system of claim 21, wherein said ancillary network includes a self-configuring bus. *(75) The method of claim 61, wherein the ancillary network includes a self-configuring bus.*	Ghodoussi discloses all the elements of claims 21 and 61, as discussed above. The analyses of claims 21 and 61 are incorporated by reference in their entirety. *See above* at claims 35 and 75 (§ V.A.viii) for the description of the "start-up routine" disclosed in Ghodoussi. That analysis is incorporated by reference in its entirety. "The main controller 20 may utilize a plug-in procedure to accommodate perfusion devices 50 that are subsequently connected to the perfusion system 10. FIG. 13B is a flowchart of a plug-in routine 260 performed by the main controller 20. During the plug-in routine, the main controller 20 may operate in an automatic match mode in which it can match a previously entered device configuration with a perfusion device that is subsequently connected to the main controller 20. . . ." (Ex. 1006, Nazarian at 8:9-23; *see also id.* at 8:24-55, Figs. 13A, 13B.) "The network controller 106 (FIG. 2) in the main controller 20, which may be a conventional network controller such as a CAN Version 2.0B, oversees the data flow on the network buses 30. . . ." (*Id.* at 8:58-63; *see also id.* at Figs. 13A, 13B; Ex. 1008, Walbrink Decl. at ¶¶ 78-2.)

D. Ground 4: Claims 21, 22, 28-31, 35, 61, 62, 68-71, And 75 Are Anticipated Under 35 U.S.C. §102(e) By Wang

Claims 21, 22, 28-31, 35, 61, 62, 68-71, and 75 are also anticipated under 35 U.S.C. § 102(e) by Wang, which discloses each element of those claims.

(i) Independent claims 21 and 61:

Independent claims 21 and 61 feature similar elements and will be addressed together. To the extent the preamble is limiting, Wang teaches "a system which controls ancillary medical devices," as recited by claim 21, and a "method for controlling ancillary medical devices," as recited by claim 61. Wang discloses, "[i]n one embodiment, an operating room control system for use during a medical procedure on a patient . . . ." (Ex. 1004, Wang at Abstract; *see also id.* at 1:24-26, 9:6-15, 13:7-8; Ex. 1008, Walbrink Decl. at ¶¶ 93-94, 95.)

Each element of independent claims 21 and 61 is found in Wang. ***First***, Wang discloses "***a surgical network***," as recited by claim 21, and "***providing a surgical network***," as recited by claim 61. Wang teaches that "the operating room control system 100 [as shown in Fig. 6 below] includes a master controller 110 that is coupled to a plurality of operating room devices 114_1-114_N via respective communication ports 118_1-118_N, where 'N' is a positive whole number. The communication ports 118_1-118_N may include any type communication port such as a serial port, parallel port, high speed serial bus, etc., and combinations thereof. The operating room devices 114_1-114_N may include any operating room device as mentioned hereinabove such as a robotic arm, electrocautery device, operating room table, operating room lights, insufflator, camera, and the like." (Ex. 1004, Wang at 9:16-27.)

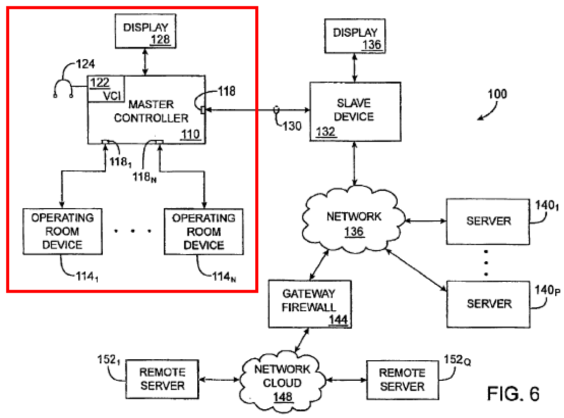


FIG. 6

(*See id.* at Fig. 6 (annotated).) "Referring to FIG. 7, the master controller 110 is coupled to the operating room devices 114_1-114_N via respective modules 170_1-170_N, and is coupled to the slave device 132 via module 174." (*Id.* at 11:20-23.) Accordingly, the "***surgical network***" of Wang is the network amongst master controller 110, the plurality of operating room devices 114_1-114_N, and the various modules identified above. (Ex. 1008, Walbrink Decl. at ¶ 95.)

Second, Wang discloses "***an input device, connected to said surgical network, which inputs a medical command***," as recited by claim 21, and "***entering a medical command into the surgical network***," as recited by claim 61. Wang discloses that "[t]he master controller 110 includes a VCI [voice control interface] for receiving selection and control commands . . . from an input device such as a microphone/headset 124," where the master controller and VCI are connected to the surgical network. (Ex. 1004, Wang at 9:31-34 (emphasis added); *see also* claim 1 ("a voice input device capable of receiving a spoken device command . . ."); Ex. 1008, Walbrink Decl. at ¶ 95.)

Third, Wang discloses "***a controller, connected to said surgical network, which receives the medical command and generates corresponding medical command data***," as recited by claim 21, and "***generating corresponding medical command data***," as recited by claim 61. Wang explains that "the operating room control system 100 includes a master controller 110 that is coupled to a plurality of operating room devices 114_1-114_N via respective communication ports 118_1-118_N, where 'N' is a positive whole number," where the master controller is connected to the surgical network. (Ex. 1004, Wang at 9:16-20 (emphasis added).) "The master controller 110 issues service requests or commands 210. If a voice command received by the master controller 110 is a recognized command for querying the slave device 132 for information, the master controller 110 forwards a service request 210 . . . to the module 174. The module 174 translates and/or processes the command into a format recognized by the slave device and forwards a trigger code command 214 to the slave device 132. The slave device 132 receives the command for processing." (*Id.* at 11:44-53 (emphasis added); Ex. 1008, Walbrink Decl. at ¶ 95.)

Fourth, Wang discloses "***a translator, connected to said surgical network,***

which receives the medical command data via said surgical network and translates the medical command data," as recited by claim 21. Wang also discloses the following similar elements, as recited by claim 61: "***communicating the medical command data via the surgical network***" and "***translating the medical command data***." Wang explains that "[t]he master controller 110 . . . is coupled to the slave device 132 via module 174. The modules are software blocks or drivers that translate signals and/or commands between the master controller 110 and the operating room devices 114_1-114_N, and the slave device 132. In one embodiment, a module is a dongle that translates signals from the master controller 110 to a specific format (e.g., protocol, timing, etc.) of the particular operating room device or slave device, and vice versa." (Ex. 1004, Wang at 11:20-30 (emphasis added).) Wang further explains that "[t]he master controller 110 issues service requests or commands 210. If a voice command received by the master controller110 is a recognized command for querying the slave device 132 for information, the master controller 110 forwards a service request 210 (e.g., 'get angiography information') to the module 174. The module 174 translates and/or processes the command into a format recognized by the slave device and forwards a trigger code command 214 to the slave device 132. The slave device 132 receives the command for processing." (*Id.* at 11:44-53 (emphasis added).) Accordingly, modules 174 serve as "***translator*[*s*]" that receive medical command data from the master controller 110 via the surgical network and translate the data. (Ex. 1008, Walbrink Decl. at ¶ 95.)

<u>Fifth</u>, Wang discloses "***at least one ancillary medical device not connectable to said surgical network, in communication with said translator via an ancillary network, which receives the translated medical command data and carries out the corresponding medical command***," as recited by claim 21. Wang also discloses the following similar elements recited by claim 61: "***communicating the translated medical command data to an ancillary medical device that is not connectable to the surgical network***" and "***executing the corresponding medical command with the ancillary medical device***." Wang discloses an "***ancillary network***," as shown by reference number 136 in Figure 6 below, where network 136 is connected to the slave device 132:

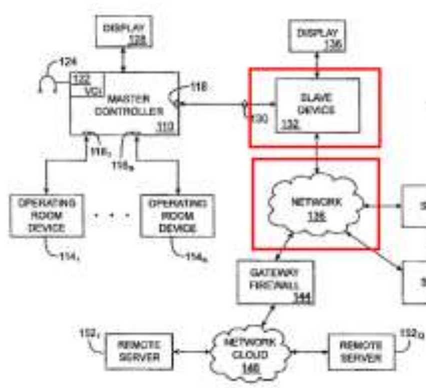


FIG. 6

(Ex. 1004, Wang at Fig. 6 (annotated).) Wang explains that the slave device is an "***ancillary medical device***," as follows: "The master controller 110 is also coupled to a slave device 132 via communication port 118 and communication lines 130. <u>In</u>

one embodiment, the slave device 132 is a device that performs actions and tasks requested by the master controller 110 . . . . The slave device 132 may simply act as another 'operating room device,' with the purpose of retrieving, storing, and displaying patient information as requested by the master controller 110." (*Id.* at 9:41-58 (emphasis added).) Wang further explains that the slave device is "***not connectable to said surgical network***" because the slave device can receive commands from the master controller 110 only if those commands have been translated by module 174 (i.e., the "*translator*"): "The master controller 110 issues service requests or commands 210. If a voice command received by the master controller 110 is a recognized command for querying the slave device 132 for information, the master controller 110 forwards a service request 210 (e.g., 'get angiography information') to the module 174. The module 174 translates and/or processes the command into a format recognized by the slave device and forwards a trigger code command 214 to the slave device 132." (*Id.* at 11:42-65 (emphasis added); *see* § III.C above.) Slave device 132 is in communication with module 174 via the ancillary network, as shown below:

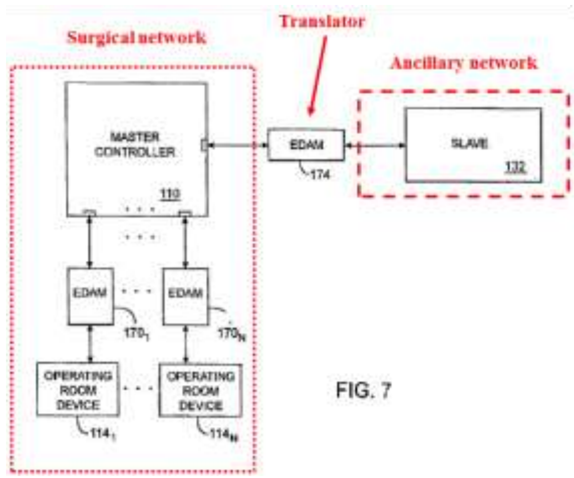


FIG. 7

(*Id.* at Fig. 7 (annotated).) The slave device then "***carries out***" or "***execut[es]***" the "***corresponding medical command***." (*Id.* at 11:53-55 ("The slave device 132 receives the command for processing. The slave device 132 then sends status commands 218 back to module 174, indicating the status of the request, retrieved information, etc."); Ex. 1008, Walbrink Decl. at ¶ 95.)

<u>Sixth</u>, Wang discloses "***feedback data generated by said at least one ancillary medical device and communicated to said translator via said ancillary network***," as recited by claim 21. Wang also discloses the following similar elements recited by claim 61: "***generating feedback data with the ancillary medical device***," "***communicating the feedback data via an ancillary network***," and "***translating the feedback data***." Wang teaches that "[t]he master controller 110 issues service requests or commands 210. If a voice command received by the master controller 110 is a recognized command for querying the slave device 132 for information, the master controller 110 forwards a service request 210 (e.g., 'get angiography information') to the module 174. The module 174 translates and/or processes the command into a format recognized by the slave device and forwards a trigger code command 214 to the slave device 132. The slave device 132 receives the command for processing. The slave device 132 then sends status commands 218 back to the module 174, indicating the status of the request, retrieved information, etc. The module 174, in turn, transmits the status command 222 to the master controller 110, indicating the status. . . ." (Ex. 1004, Wang at 11:44-57 (emphasis added).) Accordingly, slave device 132 generates "***feedback data***" in the form of status commands, which is then transmitted over "***ancillary network***" 136 to module 174 (i.e., the "***translator***") and ultimately back to master controller 110. Because slave device 132 cannot receive commands from master controller 110 unless those commands have been translated by module 174 (as discussed above), Wang discloses that module 174 must also translate the feedback data from the slave device before sending the feedback data to master controller 110. This is supported by the bidirectional arrows moving to and from module 174, as shown in the Figure below:

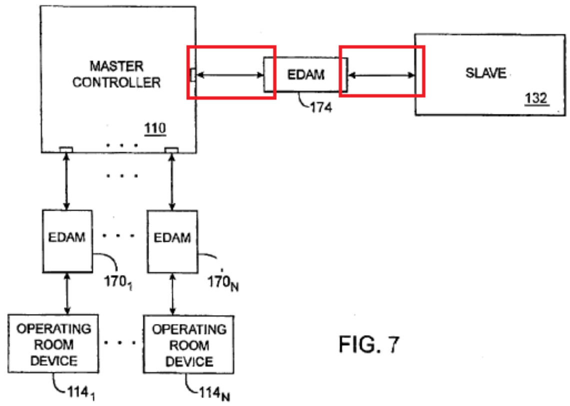


FIG. 7

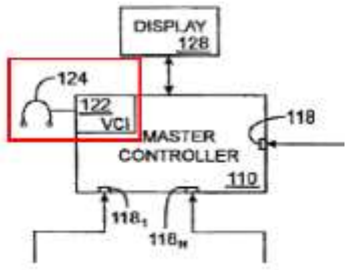
(*Id.* at Fig. 7 (annotated); Ex. 1008, Walbrink Decl. at ¶ 95.)

Seventh and finally, Wang discloses "***communicating the translated feedback data to the surgical network***," as recited by claim 61. Wang discloses that "module 174 . . . transmits the status command 222 [i.e., the "***translated feedback data***"] to the master controller 110, indicating the status," where master controller 110 is in the surgical network. (Ex. 1004, Wang at 11:55-57; Ex. 1008, Walbrink Decl. at ¶ 95.)

Turning to the dependent claims, Wang discloses all the limitations of dependent claims 22, 28-31, 35, 62, 68-71, and 75, as discussed below. Due to substantial overlap, certain claims are addressed together below.

(ii) Claim 22:

Wang discloses that "***said input device is connected to said controller***." Wang teaches that "[t]he master controller 110 also includes a VCI [voice control interface] for receiving selection and control commands . . . from an input device such as a microphone/headset 124." (Ex. 1004, Wang at 9:31-34.) As expressly shown in the Figure below, the microphone/headset 124 is connected to master controller 110:



(*Id.* at Fig. 6 (cropped) (annotated); Ex. 1008, Walbrink Decl. at ¶ 96.)

(iii) Claim 62:

Wang discloses that "***the medical command is entered with an input device that is connected to a controller that generates the corresponding medical command data***." Wang teaches that "master controller 110 . . . includes a VCI [voice control interface] for receiving selection and control commands . . . from an input device such as a microphone/headset 124." (Ex. 1004, Wang at 9:31-34.) "The master controller 110 issues service requests or commands 210. If a voice command received by the master controller 110 is a recognized command for querying the slave device 132 for information, <u>the master controller 110 forwards a service request 210 (e.g., 'get angiography information') to the module 174</u>. The module 174 translates and/or processes the command into a format recognized by the slave device and forwards a trigger code command 214 to the slave device132. The slave device 132 receives the command for processing." (*Id.* at 11:44-53 (emphasis added).) As shown in the Figure immediately above, the microphone/headset 124 is connected to master controller 110. (*See id.* at Fig. 6; Ex. 1008, Walbrink Decl. at ¶ 97.)

(iv) Claims 28, 68:

Wang discloses that the "***surgical network comprises an Ethernet***." Wang teaches that "[t]he system 300 is developed for accessing disparate medical data across a network 315, which represents <u>a local area network</u>, wide area network, direct connection, or combinations thereof." (Ex. 1004, Wang at 12:46-50 (emphasis added); *see also id.* at Abstract ("The invention provides a single interface to many disparate forms of medical data, which is accessible over <u>a local area network</u>, wide area network, direct connection, or combinations thereof."), 10:6-8.) Accordingly, Wang discloses the use of local area networks ("LAN"), and thereby discloses the use of Ethernet, which a person of ordinary skill would recognize as the most prevalent type of LAN, for the surgical network. (Ex. 1008, Walbrink Decl. at ¶ 98.)

(v) Claims 29, 69:

Wang discloses "***an ancillary controller [is] connected to [said/the] ancillary network***." Wang discloses that, "[<u>i]n one or more implementations of the present system 10, there is provided one master controller 12 and at least one slave 14 controller. . . . In this way, a plurality of devices may be attached to several different controllers</u> and the lexicon stored in each controller does not have to be downloaded into the master 12." (Ex. 1004, Wang at 4:52-62 (emphasis added).) Accordingly, Wang teaches that there may be a second, "***ancillary controller***" connected to network 136. (Ex. 1008, Walbrink Decl. at ¶ 99.)

(vi) Claims 30, 70:

Wang discloses that "***said ancillary network includes an ancillary input device***" (claim 30), and that "***an ancillary input device is connected to the ancillary network***" (claim 70). Wang explains that, in an embodiment having multiple controllers (as described above), "[a]ll the other controllers [beside the master controller], which for purposes herein, are referred to as slaves 14, include the lexicon for the devices that are directly connected thereto. For example, in FIG. 1, one slave includes the lexicon for the control commands and the select commands for a robotic arm and an operating table. This way, <u>that controller can have a microphone plugged into the VCI which is included in the unit and it may serve as a solo unit</u>. Or, depending upon the configuration of the control system 10, it may actually serve as a master. The entire system 10 is configurable at startup and as such is expandable. <u>Every controller preferably includes a VCI [voice control interface]</u>." (Ex. 1004, Wang at 5:1-11 (emphasis added).) Moreover, each VCI preferably includes an "*input device*," namely, a microphone. (*See id.* at 3:31-45, 4:28-30, Fig. 3.) Accordingly, Wang teaches that each controller in the system, including the "*ancillary controller*," includes a voice input device, which is connected to the ancillary controller and thus also connected to the ancillary network. (Ex. 1008, Walbrink Decl. at ¶ 100.)

(vii) Claims 31, 71:

Wang discloses that the "***ancillary input device is connected to [said/the] ancillary controller***." As described above, Wang explains that, in an embodiment having multiple controllers, "<u>[e]very controller preferably includes a VCI [voice control interface]</u>." (Ex. 1004, Wang at 5:11.) As shown in Fig. 6 above, the VCI of the master controller is connected directly to the master, and the same is true for the VCI of the "*ancillary controller*," as well. (Ex. 1008, Walbrink Decl. at ¶ 101.)

(viii) Claims 35, 75:

Wang discloses that the "***ancillary network includes a self-configuring bus***." In particular, Wang explains that "the master controller 12 [is provided with] a list of the devices that are in electrical communication therewith upon start-up of the control system 10." (Ex. 1004, Wang at 3:25-30.) "At startup every controller, whether the master 12 or a slave 14 knows the addresses of its communication ports. It sends a query to each communication port to see if a device is connected thereto. . . . Every slave controller establishes a lookup table of addresses and associated device codes or names. The device codes or names are transmitted to the master 12 which includes all the devices and the corresponding address of the port to which the associated slave controller is connected to the master 12." (*Id.* at 6:2-14.) As a result, "<u>upon startup, the master 12 knows all devices that are connected to the system, as each slave sends to the master the addresses of each</u>

device and the name (i.e. coded phonemes that constitute the device) of the device." (*Id.* at 7:8-12 (emphasis added); *see also id.* at 5:9-11 ("The entire system 10 is configurable at startup and as such is expandable."), 5:42-47, 6:61-64; Ex. 1008, Walbrink Decl. at ¶¶ 102.)

Wang also discloses that the ancillary network comprises a bus, as follows: "Every slave can be attached to one master, and that master, can, in turn be attached to another master, thus providing a daisy-chain of slaves all of which are connected to one master . . . ." (Ex. 1004, Wang at 6:30-34.) A person of ordinary skill would recognize that the term "daisy-chain" is a term of art referring to a bus. (*See* Ex. 1008, Walbrink Decl. at ¶ 102) Wang thus teaches a self-configuring bus, which applies to either the surgical or the ancillary network. (*See id.*)

Claim Charts: The below claim charts contain detailed citation to disclosure in Wang that anticipates each of claims 21, 22, 28-31, 35 61, 62, 68-71, and 75 of the '657 patent. Due to substantial overlap, certain claims are addressed together in a single chart below.

Claims 21, 61	Wang
(21) A system which controls ancillary medical devices, comprising: *(61) A method for controlling ancillary medical devices, the method comprising:*	"In one embodiment, an operating room control system for use during a medical procedure on a patient includes an input device, a display device, and a controller that is coupled to the input device and the display device. The controller receives one or more user inputs, transmits a command to a server located outside of the operating room to retrieve the medical data, receives the medical data from the server, and displays the medical data on the display device."

	(Ex. 1004, Wang at Abstract.) "The present invention relates generally to control systems, and specifically, to information control systems for accessing and integrating medical data for medical purposes." (*Id.* at 1:24-26; *see also id.* at 9:6-15, 13:7-8 ("The present invention may be implemented as a method, apparatus, system, etc."); Ex. 1008, Walbrink Decl. at ¶ 95.)
(21) a surgical network; *(61) providing a surgical network;*	"Referring to FIG. 6, the operating room control system 100 includes a master controller 110 that is coupled to a plurality of operating room devices 114 $_1$-114 $_N$ via respective communication ports 118 $_1$-118 $_N$, where 'N' is a positive whole number. The communication ports 118 $_1$-118 $_N$ may include any type communication port such as a serial port, parallel port, high speed serial bus, etc., and combinations thereof. The operating room devices 114 $_1$-114 $_N$ may include any operating room device as mentioned hereinabove such as a robotic arm, electrocautery device, operating room table, operating room lights, insufflator, camera, and the like." (Ex. 1004, Wang at 9:16-27.) "Referring to FIG. 7, the master controller 110 is coupled to the operating room devices 114 $_1$-114 $_N$ via respective modules 170 $_1$-170 $_N$, and is coupled to the slave device 132 via module 174." (*Id.* at 11:20-23; Ex. 1008, Walbrink Decl. at ¶ 95.)
(21) an input device, connected to said surgical network, which inputs a medical command; *(61) entering a medical command into the surgical network;*	"The master controller 110 includes a VCI [voice control interface] for receiving selection and control commands . . . from an input device such as a microphone/headset 124." (Ex. 1004, Wang at 9: 31-34; Ex. 1008, Walbrink Decl. at ¶ 95.)
(21) a controller, connected to said surgical network, which receives the medical	"[T]he operating room control system 100 includes a <u>master controller 110</u> that is coupled to a plurality of operating room devices 114 $_1$-114 $_N$ via respective communication ports 118 $_1$-118 $_N$, where 'N' is a

command and generates corresponding medical command data; *(61) generating corresponding medical command data;*	positive whole number." (Ex. 1004, Wang at 9:16-20 (emphasis added).) "The master controller 110 issues service requests or commands 210. If a voice command received by the master controller 110 is a recognized command for querying the slave device 132 for information, the master controller 110 forwards a service request 210 (e.g., 'get angiography information') to the module 174. The module 174 translates and/or processes the command into a format recognized by the slave device and forwards a trigger code command 214 to the slave device132. The slave device 132 receives the command for processing." (*Id.* at 11:44-53 (emphasis added); Ex. 1008, Walbrink Decl. at ¶ 95.)
(21) a translator, connected to said surgical network, which receives the medical command data via said surgical network and translates the medical command data; *(61) communicating the medical command data via the surgical network;* *(61) translating the medical command data;*	"The master controller 110 is coupled to the operating room devices 114_1-114_N via respective modules 170_1-170_N, and is coupled to the slave device 132 via module 174. The modules are software blocks or drivers that translate signals and/or commands between the master controller 110 and the operating room devices 114_1-114_N, and the slave device 132. In one embodiment, a module is a dongle that translates signals from the master controller 110 to a specific format (e.g., protocol, timing, etc.) of the particular operating room device or slave device, and vice versa." (Ex. 1004, Wang at 11:20-30 (emphasis added).) "The master controller 110 issues service requests or commands 210. If a voice command received by the master controller110 is a recognized command for querying the slave device 132 for information, the master controller 110 forwards a service request 210 (e.g., 'get angiography information') to the module 174. The module 174 translates and/or processes the command into a format recognized by the slave device and forwards a trigger code command 214 to the slave device 132. The slave device 132 receives the command for processing." (*Id.* at 11:44-53 (emphasis added); Ex. 1008, Walbrink Decl. at ¶ 95.)
(21) at least one ancillary	(*See* Ex. 1004, Wang at Fig. 6 ("Network" 136).)

medical device not connectable to said surgical network, in communication with said translator via an ancillary network, which receives the translated medical command data and carries out the corresponding medical command; and *(61) communicating the translated medical command data to an ancillary medical device that is not connectable to the surgical network;* *(61) executing the corresponding medical command with the ancillary medical device;*	"The master controller 110 is also coupled to a slave device 132 via communication port 118 and communication lines 130. In one embodiment, the slave device 132 is a device that performs actions and tasks requested by the master controller 110 . . . . The slave device 132 may simply act as another 'operating room device,' with the purpose of retrieving, storing, and displaying patient information as requested by the master controller 110." (*Id.* at 9:41-58 (emphasis added).) "The master controller 110 issues service requests or commands 210. If a voice command received by the master controller 110 is a recognized command for querying the slave device 132 for information, the master controller 110 forwards a service request 210 (e.g., 'get angiography information') to the module 174. The module 174 translates and/or processes the command into a format recognized by the slave device and forwards a trigger code command 214 to the slave device 132." (*Id.* at 11:42-65 (emphasis added); *see also id.* at Fig. 7; *see* § III.C above.) "The slave device 132 receives the command for processing. The slave device 132 then sends status commands 218 back to module 174, indicating the status of the request, retrieved information, etc." (*Id.* at 11:53-55; Ex. 1008, Walbrink Decl. at ¶ 95.)
(21) feedback data generated by said at least one ancillary medical device and communicated to said translator via said ancillary network. *(61) generating feedback data with the ancillary medical device;* *(61) communicating the*	"The master controller 110 issues service requests or commands 210. If a voice command received by the master controller110 is a recognized command for querying the slave device 132 for information, the master controller 110 forwards a service request 210 (e.g., 'get angiography information') to the module 174. The module 174 translates and/or processes the command into a format recognized by the slave device and forwards a trigger code command 214 to the slave device 132. The slave device 132 receives the command for processing. The slave device 132 then sends status commands 218

feedback data via an ancillary network; *(61) translating the feedback data;*	back to the module 174, indicating the status of the request, retrieved information, etc. The module 174, in turn, transmits the status command 222 to the master controller 110, indicating the status. . . ." (Ex. 1004, Wang at 11:44-57 (emphasis added); *see also id*. at Fig. 7; Ex. 1008, Walbrink Decl. at ¶ 95.)
(61) communicating the translated feedback data to the surgical network.	"[M]odule 174 . . . transmits the status command 222 to the master controller 110, indicating the status." (Ex. 1004, Wang at 11:55-57; Ex. 1008, Walbrink Decl. at ¶ 95.)
Claim 22	**Wang**
22. The system of claim 21, wherein said input device is connected to said controller.	Wang discloses all the elements of claim 21, as discussed above. The analysis of claim 21 is incorporated by reference in its entirety. "The master controller 110 also includes a VCI [voice control interface] for receiving selection and control commands . . . from an input device such as a microphone/headset 124." (Ex. 1004, Wang at 9:31-34; *see also id.* at Fig. 6; Ex. 1008, Walbrink Decl. at ¶ 96.)
Claim 62	**Wang**
62. The method of claim 61, wherein the medical command is entered with an input device that is connected to a controller that generates the corresponding medical command data.	Wang discloses all the elements of claim 61, as discussed above. The analysis of claim 61 is incorporated by reference in its entirety. "[M]aster controller 110 . . . includes a VCI [voice control interface] for receiving selection and control commands . . . from an input device such as a microphone/headset 124." (Ex. 1004, Wang at 9:31-34.) "The master controller 110 issues service requests or commands 210. If a voice command received by the master controller 110 is a recognized command for querying the slave device 132 for information, the master controller 110 forwards a service request 210 (e.g., 'get angiography information') to the module 174. The module 174 translates and/or processes the command into a format recognized by the slave device and forwards a trigger code command 214 to the slave

	device132. The slave device 132 receives the command for processing." (*Id.* at 11:44-53 (emphasis added); *see also id.* at Fig. 6 (ref. nos. 110, 122, 124); Ex. 1008, Walbrink Decl. at ¶ 97.)
Claims 28, 68	**Wang**
(28) The system of claim 21, wherein said surgical network comprises an Ethernet. *(68) The method of claim 61, wherein the surgical network comprises an Ethernet.*	Wang discloses all the elements of claims 21 and 61, as discussed above. The analyses of claims 21 and 61 are incorporated by reference in their entirety. "The system 300 is developed for accessing disparate medical data across a network 315, which represents <u>a local area network</u>, wide area network, direct connection, or combinations thereof." (Ex. 1004, Wang at 12:46-50 (emphasis added); *see also id.* at Abstract, 10:6-8; Ex. 1008, Walbrink Decl. at ¶ 98.)
Claims 29, 69	**Wang**
(29) The system of claim 21, further comprising an ancillary controller connected to said ancillary network. *(69) The method of claim 61, wherein an ancillary controller is connected to the ancillary network.*	Wang discloses all the elements of claims 21 and 61, as discussed above. The analyses of claims 21 and 61 are incorporated by reference in their entirety. "<u>In one or more implementations of the present system 10, there is provided one master controller 12 and at least one slave 14 controller. . . . In this way, a plurality of devices may be attached to several different controllers</u> and the lexicon stored in each controller does not have to be downloaded into the master 12." (Ex. 1004, Wang at 4:52-62 (emphasis added); Ex. 1008, Walbrink Decl. at ¶ 99.)
Claims 30, 70	**Wang**
(30) The system of claim 29, wherein said ancillary network includes an ancillary input device. *(70) The method of claim 69, wherein an ancillary input device is connected to the ancillary network.*	Wang discloses all the elements of claims 29 and 69, as discussed above. The analyses of claims 29 and 69 are incorporated by reference in their entirety. "In one or more implementations of the present system 10, there is provided one master controller 12 and at least one slave 14 controller." (Ex. 1004, Wang at 4:52-54.) "All the other controllers [beside the master], which for purposes herein, are referred to as slaves 14, include the lexicon for the devices that are directly connected thereto. For example, in FIG.

	1, one slave includes the lexicon for the control commands and the select commands for a robotic arm and an operating table. This way, that controller can have a microphone plugged into the VCI which is included in the unit and it may serve as a solo unit. Or, depending upon the configuration of the control system 10, it may actually serve as a master. The entire system 10 is configurable at startup and as such is expandable. Every controller preferably includes a VCI [voice control interface].” (*Id.* at 5:1-11 (emphasis added); *see also id.* at 3:31-45, 4:28-30,Fig. 3 (ref. no. 34); Ex. 1008, Walbrink Decl. at ¶ 100.)
Claims 31, 71	**Wang**
(31) The system of claim 30, wherein said ancillary input device is connected to said ancillary controller. *(71) The method of claim 70, wherein the ancillary input device is connected to the ancillary controller.*	Wang discloses all the elements of claims 30 and 70, as discussed above. The analyses of claims 30 and 70 are incorporated by reference in their entirety. “Every controller preferably includes a VCI [voice control interface].” (Ex. 1004, Wang at 5:11; *see also id.* at Fig. 6; Ex. 1008, Walbrink Decl. at ¶ 101.)
Claims 35, 75	**Wang**
(35) The system of claim 21, wherein said ancillary network includes a self-configuring bus. *(75) The method of claim 61, wherein the ancillary network includes a self-configuring bus.*	Wang discloses all the elements of claims 21 and 61, as discussed above. The analyses of claims 21 and 61 are incorporated by reference in their entirety. “The master controller 12 [is provided with] a list of the devices that are in electrical communication therewith upon start-up of the control system 10.” (Ex. 1004, Wang at 3:25-30.) “At startup every controller, whether the master 12 or a slave 14 knows the addresses of its communication ports. It sends a query to each communication port to see if a device is connected thereto. . . . Every slave controller establishes a lookup table of addresses and associated device codes or names. The device codes or names

	are transmitted to the master 12 which includes all the devices and the corresponding address of the port to which the associated slave controller is connected to the master 12." (*Id.* at 6:2-14, 7:8-12; *see also id.* at 5:9-11, 5:42-47, 6:61-64.) "Every slave can be attached to one master, and that master, can, in turn be attached to another master, thus providing a daisy-chain of slaves all of which are connected to one master . . . ." (*Id.* at 6:30-34 (emphasis added); Ex. 1008, Walbrink Decl. at ¶ 102.)

E. Ground 5: Claims 21, 22, 28-31, 35, 61, 62, 68-71, And 75 Are Rendered Obvious Under 35 U.S.C. § 103(a) In View Of Ghodoussi And Wang

Ghodoussi discloses all the elements of claims 21, 22, 28-31, 35, 61, 62, 68-71, and 75, as discussed in § V.A above. To the extent the Board determines, however, that Ghodoussi fails to expressly or inherently disclose the limitation of claim 21 reciting "***a translator***," and the limitations of claim 61 reciting "***translating the medical command data***" and "***translating the feedback data***," claims 21 and 61 are rendered obvious by Ghodoussi combined with Wang.

As discussed above at § V.D.i, Wang expressly discloses a translator. It would have been obvious for a person of ordinary skill to combine the translator of Wang with the system of Ghodoussi because Ghodoussi, itself, provides a teaching, suggestion, or motivation for doing so. (Ex. 1008, Walbrink Decl. at ¶ 106.) In particular, Ghodoussi recognizes that different devices may communicate using different network and/or command protocols, thus necessitating translation. (*See id.*; Ex. 1003, Ghodoussi at 6:65-7:8; 8:49-58.)

The combination of the translator of Wang with the system of Ghodoussi would also have been obvious because it involves only the predictable use of prior art elements according to their established functions. (*See* Ex. 1008, Walbrink Decl. at ¶ 107.) Wang shows that translators were well known at the time of the alleged invention of the '657 patent. (*See id.*) A person of ordinary skill would have known how to use a translator, like that disclosed in Wang, between the two networks of Ghodoussi if needed to enable communications among devices therein that operated using different network and/or command protocols. (*See id.*) This combination would have yielded predictable results because it would entail using a translator for its usual function. (*See id.*) Moreover, as described above at § V.A.i, Ghodoussi itself discloses components that together perform a translation function—namely, the interconnect devices and network computer. (*See id.*) Petitioner is not aware of any secondary considerations that would tend to show that this combination is non-obviousness—particularly any secondary considerations having a nexus to the claimed inventions. (*See id.* at ¶ 109.)

The additional limitations of claims 22, 28-31, and 35, which depend from claim 21, and claims 62, 68-71, and 75, which depend from claim 61, are disclosed in Ghodoussi and Wang, as discussed above in §§ V.A and V.D, respectively.

F. Ground 6: Claims 28 And 68 Are Rendered Obvious Under 35 U.S.C. § 103(a) In View Of Wang And Webb

To the extent the Board determines that Wang does not expressly or inherently disclose all of the limitations of claims 28 and 68, those limitations can also easily and obviously be found in Webb. (Ex. 1008, Walbrink Decl. at ¶¶ 110-24.) The relevant disclosure of Webb with respect to Ethernet was discussed above at § V.D.iv. Like Ghodoussi, Wang discloses a system that includes multiple controllers in communication with a plurality of medical devices. It would have been obvious to one of ordinary skill at the time of the alleged invention of the '657 patent to combine Wang and Webb for the same reasons discussed above in § V.B with respect to the combination of Ghodoussi and Webb. (*See id.*) That discussion is incorporated by reference here in its entirety. Petitioner is not aware of any secondary considerations that would tend to show that this combination is non-obviousness—particularly any secondary considerations having a nexus to the claimed inventions. (*See id.* at ¶ 124.)

Claim Charts: The below claim chart contains detailed citation to disclosure in Wang and Webb, the combination of which renders obvious claims 28 and 68 of the '657 patent.

Claims 28, 68	Wang in Combination with Webb
(28) The system of claim 21, wherein said surgical network comprises an Ethernet. *(68) The method of claim 61, wherein the surgical network comprises an Ethernet.*	Wang discloses all the elements of claims 21 and 61, as discussed above. The analyses of claims 21 and 61 are incorporated by reference in its entirety. *See above* at claims 28 and 68 (§ V.D.iv) for the description of the local-area network disclosed in Wang. That analysis is incorporated by reference in its entirety. "Yet other types of medical devices may interface to

	communications network 6. . . . Such signals may be transferred over various network connections that include Ethernet or infrared connections." (Ex. 1005, Webb at ¶ 0042; *see also id.* at Abstract, ¶¶ 0003, 0045; Ex. 1008, Walbrink Decl. at ¶¶ 110-24.)

G. Ground 7: Claims 35 And 75 Are Rendered Obvious Under 35 U.S.C. §103(a) In View Of Wang In Combination With Nazarian

To the extent the Board determines that Wang does not expressly or inherently disclose all the limitations of claims 35 and 75, those limitations can easily and obviously be found in Nazarian. (Ex. 1008, Walbrink Decl. at ¶¶ 125-38.) The relevant disclosure of Nazarian with respect to self-configuring buses was discussed above at § V.C. Like Ghodoussi, Wang discloses a system that includes multiple controllers in communication with a plurality of medical devices. It would have been obvious to one of ordinary skill in the art at the time of the alleged invention of the '657 patent to combine Wang and Nazarian for the same reasons discussed above in § V.C with respect to the combination of Ghodoussi and Nazarian. (*See id.*) That discussion is incorporated by reference here in its entirety. Petitioner is not aware of any secondary considerations that would tend to show that this combination is non-obviousness—particularly any secondary considerations having a nexus to the claimed inventions. (*See id.* at ¶ 138.)

Claim Charts: The below claim chart contains detailed citation to disclosure in Wang and Nazarian, the combination of which renders obvious claims 35 and 75 of the '657 patent.

Claims 35, 75	Wang in Combination with Nazarian
(35) The system of claim 21, wherein said ancillary network includes a self-configuring bus. *(75) The method of claim 61, wherein the ancillary network includes a self-configuring bus.*	Wang discloses all the elements of claims 21 and 61, as discussed above. The analyses of claims 21 and 61 are incorporated by reference in its entirety. *See* above at claims 35 and 75 (§ V.D.viii) for the description of the start-up routine disclosed in Wang. That analysis is incorporated by reference in its entirety. "The main controller 20 may utilize a plug-in procedure to accommodate perfusion devices 50 that are subsequently connected to the perfusion system 10. FIG. 13B is a flowchart of a plug-in routine 260 performed by the main controller 20. During the plug-in routine, the main controller 20 may operate in an automatic match mode in which it can match a previously entered device configuration with a perfusion device that is subsequently connected to the main controller 20. . . ." (Ex. 1006, Nazarian at 8:9-23; *see also id.* at 8:24-55, Figs. 13A, 13B.) "The network controller 106 (FIG. 2) in the main controller 20, which may be a conventional network controller such as a CAN Version 2.0B, oversees the data flow on the network buses 30. . . ." (*Id.* at 8:58-63; Ex. 1008, Walbrink Decl. at ¶¶ 125-38.)

VI. REASONS WHY PROPOSED GROUNDS ARE NON-REDUNDANT

Petitioner respectfully submits that each above-proposed ground is non-redundant. Petitioner offers anticipation grounds for Ghodoussi and Wang, which are unrelated references that have distinctive disclosures. Webb and Nazarian are the only references for which Petitioner offers obviousness rationales for claims 28 and 68 and claims 35 and 75, respectively. Finally, Petitioner offers Ghodoussi and Wang as the only obviousness combination for independent claims 21 and 61.

VII. CONCLUSION

For the above reasons, Petitioner respectfully requests institution of *inter partes* review of claims 21, 22, 28-31, 35, 61, 62, 68-71, and 75 of the '657 patent.

Respectfully submitted,

Dated: February 18, 2015 By: /s/ Robert A. Surrette

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CERTIFICATE OF SERVICE

I hereby certify that true and correct copies of the foregoing Petition for *Inter Partes* Review of U.S. Patent No. 7,844,657 and Exhibits 1001-1008 were served on February 18, 2015 by Federal Express on the following attorney of record listed on PAIR:

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