

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BUTTERFLY NETWORK, INC.,
Petitioner,

v.

FUJIFILM SONOSITE, INC.,
Patent Owner.

IPR2022-01575
Patent 7,867,168 B2

Before WILLIAM V. SAINDON, BARBARA A. BENOIT, and
FRANCES L. IPPOLITO, *Administrative Patent Judges*.

IPPOLITO, *Administrative Patent Judge*.

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

I. INTRODUCTION

Butterfly Network, Inc. (“Petitioner”) filed a Petition requesting an *inter partes* review of claims 1–6, 12, 13, and 15 of U.S. Patent No. 7,867,168 B2 (Ex. 1001, “the ’168 patent”). Paper 1 (“Pet.”). FUJIFILM Sonosite, Inc. (“Patent Owner”) has not filed a Preliminary Response to the Petition.

Under 35 U.S.C. § 314(a), an *inter partes* review may not be instituted unless the information presented in the Petition and any response thereto shows “there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” Considering the arguments presented in the parties’ briefs, we conclude that the information presented in the Petition establishes that there is a reasonable likelihood that Petitioner would prevail in challenging at least 1 of the claims 1–6, 12, 13, and 15 of the ’168 patent as unpatentable under the grounds presented in the Petition. Pursuant to § 314, we hereby institute an *inter partes* review.

A. Related Matters

The Parties indicate the ’168 patent (together with U.S. Patent Nos. 9,538,985 B2 and 6,901,157 B2) has been asserted in: *FUJIFILM Sonosite, Inc. v. Butterfly Network, Inc.*, No. 1:22-cv-00309-JPM (D. Del.). Pet. 2; Paper 3, 2; Paper 6, 1.

Petitioner also indicates that it has filed petitions requesting *inter partes* review of U.S. Patent No. 9,538,985 B2 (IPR2022-01576) and U.S. Patent No. 6,901,157 B2 (IPR2022-01577). Paper 6, 1.

B. The '168 Patent

The '168 patent is titled “Ultrasonic Transducer Having Distributed Weight Properties,” and “relates to ultrasound devices and more particularly to such devices having a thin wire interface.” Ex. 1001, codes (54), (57), 1:26–28. The '168 patent describes ultrasound medical devices including ultrasound systems in which signal processing functionality is partitioned such that “a portion of the ultrasound signal processing is contained within the transducer assembly of an ultrasound system, thereby reducing the need for a multiplicity of high performance conductors, or other relatively high bandwidth, high fidelity bandwidth running between the transducer and the main body of the ultrasound system.” *Id.* at 1:37, 2:20–25. Moreover, a distributed power source configuration may be utilized such that a portion of the power source is disposed in the ultrasound device main processing unit and another portion of the power source is disposed in the ultrasound device transducer assembly. *Id.* at 3:1–5.

The '168 patent explains that the redistribution of signal processing functionality in the ultrasound device enables a distribution of weight between a transducer assembly and a corresponding main processing unit, whereby the “transducer assembly may be provided with a desired amount of mass, such as for an improved user experience, improved interfacing with scanned objects, [and] a more traditional weight.” *Id.* at 2:59–63. The '168 patent also explains that the main processing unit in the ultrasound device may have reduced mass “to provide a more portable unit, [and] a better balance of weight between the main processing unit and transducer assembly.” *Id.* at 2:65–67, 3:9–11.

Fig. 2 of the '168 patent, reproduced below, illustrates an ultrasound system partitioned to allow for digital signaling between the transducer and the main processor. *Id.* at 3:41–44.

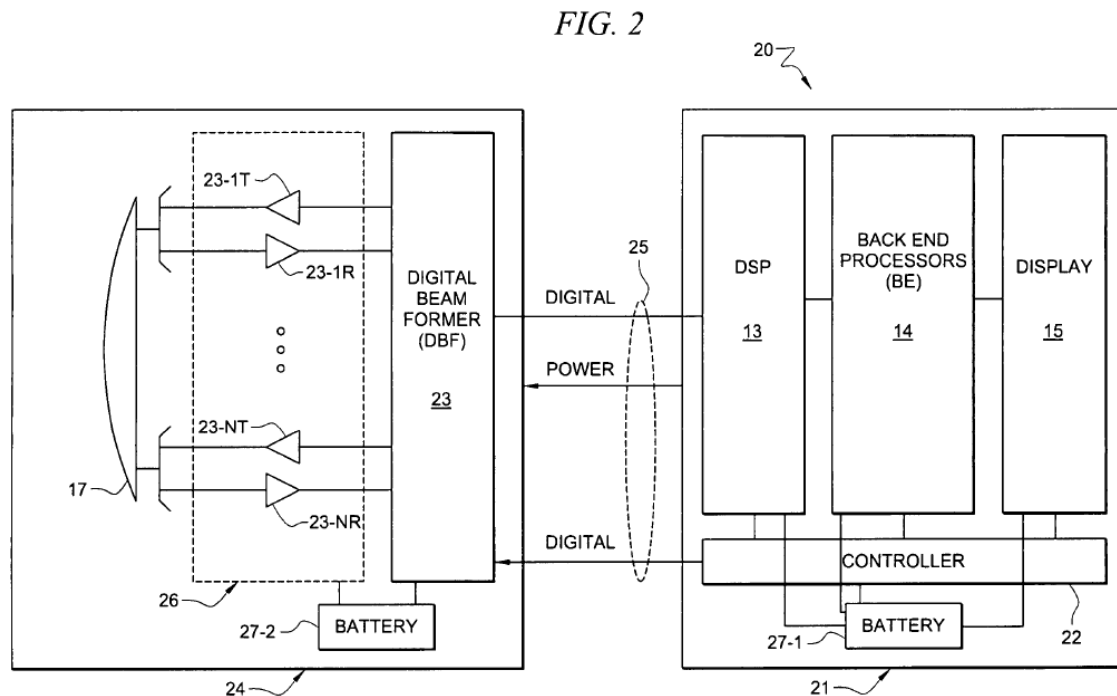


Fig. 2 illustrates an ultrasound system 20 in which signal processing functionality is partitioned such that a portion of the ultrasound signal processing is contained within the transducer assembly of an ultrasound system. *Id.* at 3:41–44, 4:9–13.

Ultrasound system 20 illustrated in Figure 2 includes processing unit 21 and transducer assembly 24, connected via digital cable 25. *Id.* As shown, both processing unit 21 and transducer assembly 24 contain batteries, e.g., 27-1, 27-2. *Id.* Transducer assembly 24 further includes transducer array 17; amplifiers 23-1T, 23-1R to 23-NT, 23-RT, which are used for driving transducer array 17, beam transformer 23, transmit/receive (Tx/Rx) circuitry 26 composed of pulser circuits, and control logic integrated in an ASIC of a digital beam former (DBF) 23. *Id.* at 3:58–61,

4:9–24, 4:31–35, Fig. 2. Processing unit 21 includes digital signal processor (DSP) 13, back end processors 14, and display 15. *Id.* at Fig. 2.

Digital cable 25 may include a pair of Low Voltage Differential Signal (LVDS) lines to transmit digital data back and forth. *Id.* at 5:54–56. The '168 patent explains that digital cable 25 “can be a much smaller cable [(as compared to analog cables used in prior art ultrasound systems to couple the transducer array to individual receiving and transmitting channels, and to the digital beam former)] since only a small number of conductors are needed to provide necessary control and/or signals.” *Id.* at 3:51–54, 4:1–8, 4:38–40.

The '168 patent explains that the signal processing circuitry and/or other circuitry may be disposed in the transducer assembly 24, rather than in the processing unit assembly 21, in order to provide a transducer assembly having a desired weight or a weight more typical of historical transducer assemblies—while eliminating weight from the processing unit assembly (thereby resulting in a lighter and more portable processing unit). *Id.* at 5:1–7. Further, the '168 patent provides that components such as signal processing circuitry and power sources may be distributed or redistributed between transducer assembly 24 and main processing unit 21 to provide a desired weight balance. *Id.* at 5:8–11.

C. Challenged Claims

Petitioner challenges claims 1–6, 12, 13, and 15. Claims 1 and 12 are independent. Claim 1 is illustrative and reproduced below:

1. [1a] A system comprising:

an ultrasound transducer assembly including an ultrasound transducer array and signal processing circuitry coupled to said transducer array operable to process analog signals from said

transducer array and provide digital information there from;

[1b] a main processing unit separate from said ultrasound transducer assembly and in communication therewith operable to receive said digital information from said ultrasound transducer assembly; and

[1c] a digital data cable coupled between said ultrasound transducer assembly and said main processing unit carrying said digital information there between;

[1d] wherein said system is powered by a battery power source, wherein portions of the battery power source are distributed between the ultrasound transducer assembly and the main processing unit.

Ex. 1001, 7:11–27 (bracketed designations added by Petitioner (*see* Pet. 23–30)).

D. Alleged Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–6, 12, 13, 15	102	Halmann ¹
1–6, 12, 13, 15	103	Halmann
1-6, 12, 13, 15	103	Halmann, Honda ²
2, 3, 5, 12, 13, 15	103	Halmann, Walston ³
2, 3, 5, 12, 13, 15	103	Halmann, Honda, Walston
6	103	Halmann, Smith ⁴

¹ Halmann et al., US 2003/0097071 A1, published May 22, 2003 (“Halmann,” Ex. 1003).

² Japanese Unexamined Patent Application Publication No. JP 2003-33350A, published February 4, 2003 (“Honda,” Ex. 1005 (including a certified English translation submitted by Petitioner) and Ex. 1056).

³ Walston et al., US 2003/0139671 A1, published July 24, 2003 (“Walston,” Ex. 1006).

⁴ Smith et al., US 2004/0179332 A1, published September 16, 2004 (“Smith,” Ex. 1007).

6	103	Halmann, Honda, Smith
1–4, 6, 12, 13, 15	102	Barnes ⁵
1–6, 12, 13, 15	103	Barnes
2, 3, 5, 12, 13, 15	103	Barnes, Walston
6	103	Barnes, Smith

Pet. 3. In addition to the references listed above, Petitioner relies on the Declaration of Christopher Daft, Ph.D. Ex. 1008.

II. ANALYSIS

A. *Level of Ordinary Skill in the Art*

In determining the level of skill in the art, we consider the type of problems encountered in the art, the prior art solutions to those problems, the rapidity with which innovations are made, the sophistication of the technology, and the educational level of active workers in the field. *Custom Accessories, Inc. v. Jeffrey-Allan Indus. Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986); *Orthopedic Equip. Co. v. United States*, 702 F.2d 1005, 1011 (Fed. Cir. 1983).

Petitioner contends that

A person of ordinary skill in the art (“POSA”) at the time of November 14, 2006, would have a degree in electrical engineering, physics, or a related discipline, along with relevant experience (at least 2-3 years for a Ph.D., 3-5 years for a Master’s, and 5+ years for a Bachelor’s) researching or developing ultrasound systems or other medical imaging devices. EX1008, ¶¶19-26. A POSA would have general knowledge of ultrasound systems and related technologies as of November 14, 2006. *Id.*

If the ’168 Patent were entitled to an August 24, 2004 priority date, the POSA would have had the degrees, experience,

⁵ Barnes et al., US 2003/0013966 A1, published January 16, 2003 (“Barnes,” Ex. 1004).

and knowledge described above as of August 24, 2004, and the challenged claims would be unpatentable for the same reasons herein. *Id.*

Pet. 9–10.

At this stage, Patent Owner has not addressed the level of ordinary skill in the art.

For purposes of this Decision, we adopt Petitioner’s proposal as reasonable and consistent with the prior art. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (the prior art may reflect an appropriate level of skill in the art).

B. Principles of Law

“Anticipation requires that every limitation of the claim in issue be disclosed, either expressly or under principles of inherency, in a single prior art reference,” *Corning Glass Works v. Sumitomo Elec. U.S.A., Inc.*, 868 F.2d 1251, 1255–56 (Fed. Cir. 1989), and that the claim limitations be “arranged or combined in the same way as recited in the claim[],” *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1371 (Fed. Cir. 2008). However, “the reference need not satisfy an *ipsissimis verbis* test.” *In re Gleave*, 560 F.3d 1331, 1334 (Fed. Cir. 2009).

In *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 (1966), the Supreme Court set out a framework for assessing obviousness under § 103 that requires consideration of four factors: (1) the “level of ordinary skill in the pertinent art,” (2) the “scope and content of the prior art,” (3) the “differences between the prior art and the claims at issue,” and (4) “secondary considerations” of non-obviousness such as “commercial success, long-felt but unsolved needs, failure of others, etc.” *Id.* at 17–18. “While the sequence of these questions might be reordered in any particular

case,” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 407 (2007), the Federal Circuit has “repeatedly emphasized that an obviousness inquiry requires examination of all four *Graham* factors and that an obviousness determination can be made only after consideration of each factor.” *Nike, Inc. v. Adidas AG*, 812 F.3d 1326, 1335 (Fed. Cir. 2016).

We note that, with respect to the fourth *Graham* factor, the current record in this proceeding does not include any argument or evidence directed to secondary considerations of nonobviousness. The analysis below addresses the first three *Graham* factors.

C. Claim Construction

In an *inter partes* review, we construe each claim “in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” 37 C.F.R. § 42.100(b). Accordingly, our claim construction standard is the same as that of a district court. *See id.* Under the standard applied by district courts, claim terms are generally given their plain and ordinary meaning as would have been understood by a person of ordinary skill in the art at the time of the invention and in the context of the entire patent disclosure. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc).

Petitioner “does not believe any terms require construction at this stage.” Pet. 10.

At this stage of the proceeding, Patent Owner has not yet filed a response.

For purposes of this decision, we do not expressly construe any terms. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d

1013, 1017 (Fed. Cir. 2017)), cert. denied, 138 S. Ct. 1695 (April 30, 2018) (noting that “we need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy’”) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

D. Overview of the Prior Art

1. Summary of Halmann (Ex. 1003)

Halmann is titled “Method and System for PDA-Based Ultrasound System.” Ex. 1003, code (54). Halmann describes a method and system for configuring a personal digital assistant (PDA) device as an integral part of a portable, hand-held ultrasound system. *Id.* ¶ 2. Figure 1 of Halmann, reproduced below, illustrates a portable diagnostic ultrasound system in which digital beamforming is performed within a hand-held probe assembly, and Figure 1B, reproduced below, shows the portable diagnostic ultrasound system of Fig. 1. *Id.* ¶¶ 11–12.

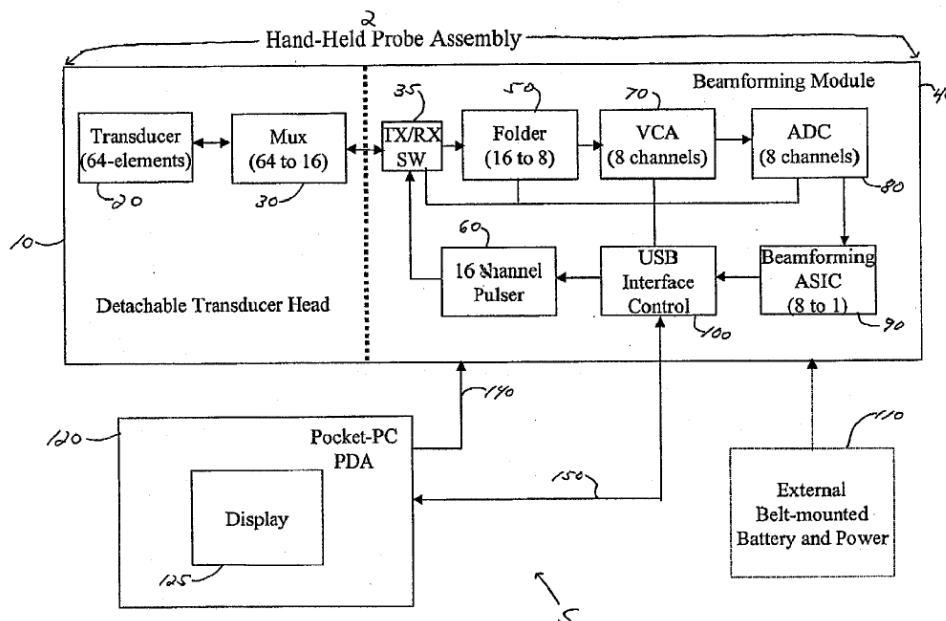


Fig. 1 illustrates a portable diagnostic ultrasound system in which digital beamforming is performed within a hand-held probe assembly. *Id.* ¶ 11.

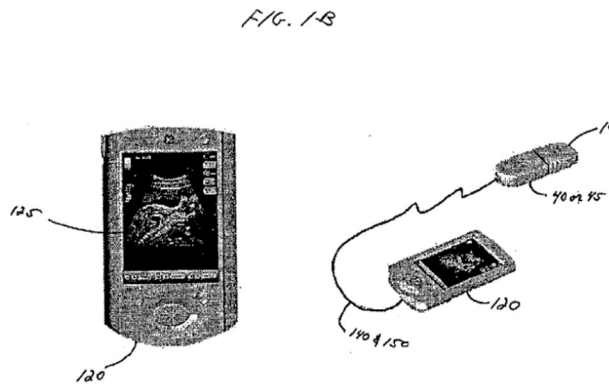


Fig. 1B shows a realistic illustration of the portable diagnostic ultrasound system of Fig. 1. *Id.* ¶ 12.

As shown in Figure 1, portable diagnostic ultrasound system 5 includes detachable transducer module 10 with transducer array 20 connected to multiplexer 30. Beamforming module 40 includes pulser 60, TX/RX switching module 35, folder module 50, voltage controlled amplifier (VCA) 70, analog-to-digital converter (ADC) 80, beamforming ASIC 90, and PDA interface controller 100. *Id.* ¶¶ 18–20.

Halmann also teaches PDA device 120 with touch-screen display 125 where PDA 120 is modified to include ultrasound data processing and application software to support a plurality of ultrasound imaging modes; and (optionally) external battery/power source 110. *Id.* ¶ 18–20. PDA 120 includes an internal battery to power the PDA and hand-held probe assembly 2, with a battery power interface 140 connecting PDA 120 and hand-held probe assembly 2. *Id.* ¶ 18. Optionally, an external battery/power source 110 connects to beamforming module 40. *Id.* ¶ 21.

In operation, PDA-based ultrasound scanner 5 transmits ultrasound energy into a subject to be imaged, and receives and processes backscattered

ultrasound signals from the subject to create and display an image on display 125 of PDA device 120. *Id.* ¶ 24. For example, a user may select transducer head 10 (shown in Fig. 1B) to connect to beamforming module 40 to form hand-held probe assembly 2 to be used for a particular scanning application. *Id.* An imaging mode is selected from a menu on display 125 of PDA device 120 using a touch-screen stylus. *Id.*

Halmann explains that

The various elements of the portable ultrasound system 5 may be combined or separated according to various embodiments of the present invention. For example, the folder 50 and VCA 70 may be combined into a single processing element. Also, the external battery 110 may be integrated into the beamforming module 40, becoming an internal battery.

...

As an alternative, the function of the beamforming ASIC 90 may be performed by software in the PDA device 120. ... Instead of the transducer head attaching to a beamforming module 40, it attaches to a signal processing module 45 that does not include the beamforming ASIC 90. The data out of the ADC 80 is sent to the PDA interface controller 100 and the pre-beamformed data is sent to the PDA 120. Digital beamforming is performed by software within the PDA 120 along with the other subsequent data processing functions.

As a further alternative, the hand-held-probe assembly may include an internal battery to provide power. A docking station may also be provided for the hand-held probe assembly to provide the function of battery recharging.

Id. ¶¶ 23, 33–34.

2. *Summary of Barnes (Ex. 1004)*

Barnes is titled “Balance Body Ultrasound System” and “relates to handheld ultrasound instruments having various diagnostic modes and transducer assemblies incorporating a balance body design, or other form

factor to reduce strain of use during scanning procedures.” Ex. 1004, code (54), ¶ 3. Barnes describes a medical hand-held ultrasound system having a balance body, a transducer assembly connected to the balance body via a communication means (such as a cable) and a plurality of control elements arranged in an ergonomic fashion on the balance body, such that a user may hold the system and operate at least one of the control elements with the same hand. *Id.* at code (57). A user interface of the ultrasound system includes a D-controller and a touch screen. *Id.* The D-Controller is a control device allowing a user to “point and click” in order to navigate an on-screen menu or displayed graphics. *Id.* ¶ 21. For example, the D-controller may be a digital directional controller (such as a four or eight directional controller), or an analog “joy stick.” *Id.*

Barnes’ medical ultrasound system may be lightweight, and include: (i) a first body having system electronics, a first transmit and receive element, and a first power supply, the first body weighing less than two pounds; (ii) a second body housing a transducer assembly that has a digital beam former, an A/D circuit, a transducer array, a second power supply, a second transmit and receive element, and at least one control element, the second body weighing less than one pound; and (iii) a head set including a visual display, a receive element, and a third power supply, such that the first body, second body, and head set are all in real time communication with each other. *Id.* ¶¶ 13, 36. The user can control the ultrasound system through the second body or first body while visualizing an ultrasound scan through the head set. *Id.* ¶ 36. Fig. 20 of Barnes, reproduced below, illustrates a medical ultrasound system being used by a medical practitioner. *Id.* ¶ 18.

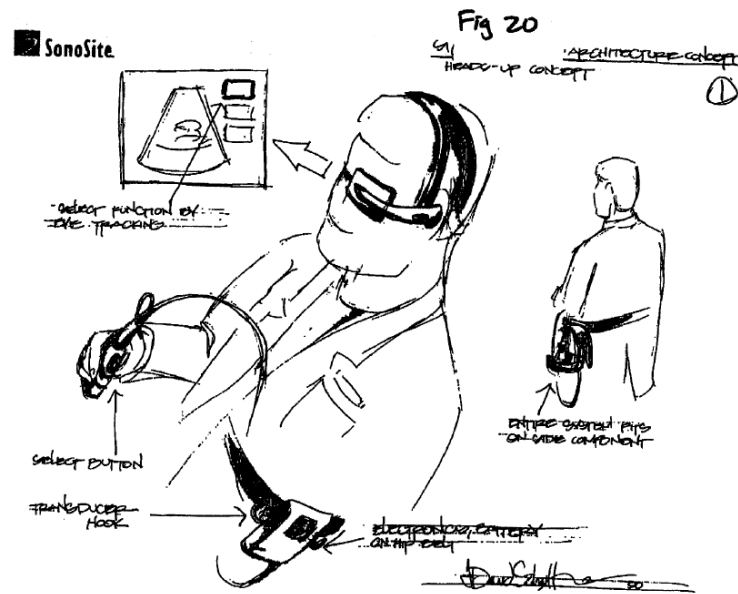


Fig. 20 illustrates a medical ultrasound system being used by a medical practitioner. *Id.* ¶ 18.

3. Summary of Honda (Exs. 1005 and 1056)

Honda is titled “Medical Diagnostic Adapter, Portable Medical Diagnostic Device, and Curved Ultrasonic Diagnostic Device.” Ex. 1005, code (54).⁶ Honda’s portable ultrasonic diagnostic device includes a medical diagnostic adapter and a Personal Digital Assistant (PDA), shown as elements 301 and 10, respectively, in Figure 6 of Honda, reproduced below. *Id.* at code (57), Fig. 6.

⁶ We cite to the certified English translation of Honda submitted by Petitioner.

[FIG. 6]

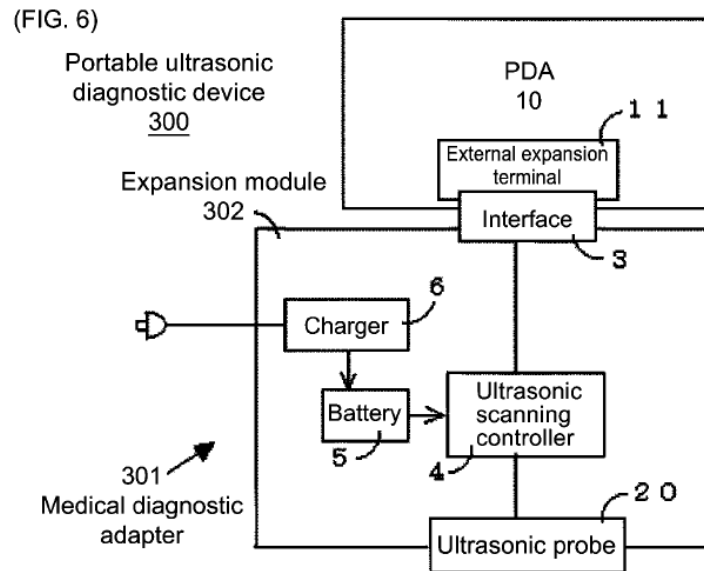


Fig. 6 is a block diagram illustrating a portable ultrasonic diagnostic device 300. *Id.* ¶ 23.

Portable ultrasonic diagnostic device 300 illustrated in Fig. 6 includes PDA 10 and medical diagnostic adapter 301, with adapter 301 including an expansion module 302 that drives ultrasonic probe 20, which transmits ultrasonic waves into a subject body, receives ultrasonic echoes from the subject body, collects medical information, and sends the collected information to PDA 10. *Id.* ¶¶ 20, 23. Expansion module 302 includes ultrasonic probe 20; ultrasonic scanning controller 4 that drives ultrasonic probe 20 to scan the subject body and obtain a reception signal; battery 5 for supplying operating power to ultrasonic scanning controller 4; charger 6 for charging battery 5; and interface 3 that is detachable from external expansion terminal 11 of PDA 10 and sends the reception signal to PDA 10. *Id.* ¶ 23. Portable ultrasonic diagnostic device 300 may be used while battery 5 is charging from, e.g., an automobile power source. *Id.* ¶ 24.

Fig. 5 of Honda, reproduced below, illustrates additional aspects of ultrasonic diagnostic device 300. *Id.* ¶¶ 20, 26.

[FIG. 5]

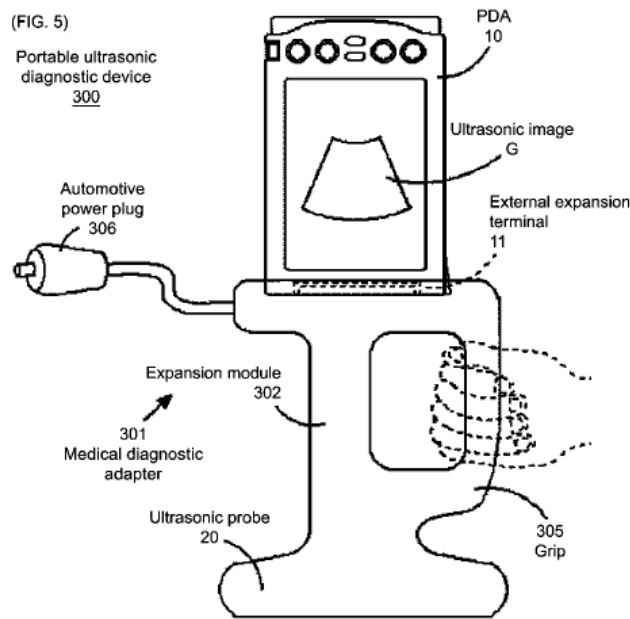


Fig. 5 illustrates additional aspects of ultrasonic diagnostic device 300. *Id.* ¶¶ 20, 26.

Expansion module 302 of ultrasonic diagnostic device 300 is provided with an automobile power plug 306 (such as an AC plug) for charging the built-in battery. *Id.* ¶ 21. Expansion module 302 is detachable from external expansion terminal 11 of PDA 10, and is integrated with PDA 10 when attached. *Id.* Grasping a grip 305 simplifies the scanning operation of the subject body. *Id.* An ultrasonic image G is displayed on the screen of PDA 10. *Id.* ¶ 22.

4. Summary of Walston (Ex. 1006)

Walston is titled “Immersive Portable Ultrasound System and Method” and “relates to portable diagnostic ultrasound systems.” Ex. 1006, code (54), ¶ 2. Walston’s portable ultrasound system provides immersive

viewing of images. *Id.* at code (57). According to Walston, the portable ultrasound system is a small, lightweight scope that includes a transducer and a display adapted for viewing ultrasound images close to the eye of the user, such as within five inches or a couple feet of the eye. *Id.*

5. *Summary of Smith (Ex. 1007)*

Smith is titled “Portable Ultrasound Unit and Docking Station” and “relates to ultrasound equipment, and more particularly, to portable ultrasound units and docking stations for such units.” Ex. 1007, code (54), ¶ 1. According to Smith, when the portable ultrasound unit is mounted to a docking cart, the docking cart transforms the portable ultrasound unit into a cart-based system with enhanced features and functionality, such as improved ergonomics, ease of use, a larger display format, external communications connectivity, multiple transducer connections, and increased data processing capabilities. *Id.* at code (57).

E. *Anticipation and Obviousness based on Halmann*

Petitioner asserts that claims 1–6, 12, 13, and 15 would have been anticipated by, and rendered obvious by, the teachings of Halmann. Pet. 3, 23–44 (Petitioner’s Grounds 1 and 2). We have reviewed the preliminary record, and we conclude Petitioner has demonstrated a reasonable likelihood of prevailing on its assertions as to at least claim 1. We address independent claim 1 below.

1. *Independent claim 1*

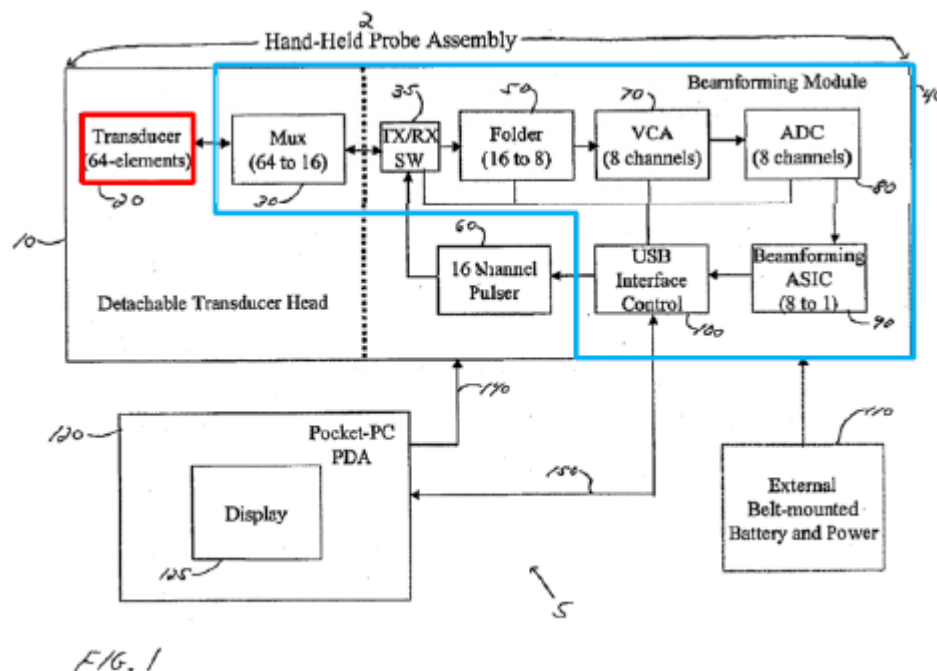
The Petition outlines how Halmann discloses, teaches, or suggests the features of independent claim 1. Pet. 23–34.

Patent Owner has not filed a preliminary response and has not offered arguments at this stage of the proceeding.

Below, we analyze Petitioner’s contentions as applied to the required elements of claim 1.

[1a] “A system comprising: an ultrasound transducer assembly including an ultrasound transducer array and signal processing circuitry coupled to said transducer array operable to process analog signals from said transducer array and provide digital information there from”

Referring to Halmann's Figures 1 and 1B, Petitioner contends probe assembly 2 discloses an ultrasound transducer array (i.e., array 20) coupled to signal processing circuitry (i.e., multiplexer 30 and circuitry in module 40). Pet. 24. Petitioner further provides an annotated version of Figure 1, provided below:



Petitioner's annotated Figure 1 depicts a portable diagnostic ultrasound system in which digital beamforming is performed within a hand-held probe assembly. Pet. 24.

Petitioner has annotated the original figure with a red box around transducer 64 and a blue box around multiplexer 30, TX/RX SW 35, Folder 50, VCA 70, ADC 80, Beamforming ASIC 90, and USB Interface Control 100. Pet. 24. Petitioner asserts that the circuitry in the blue box processes analog signals from the array (marked by the red box). *Id.* at 25. Petitioner contends that

Halmann explained,

It is more desirable to perform beamforming in the digital domain by first converting ultrasound data from the analog domain to the digital domain.” EX1003, ¶¶6, 8-9, 38. The ADC connects to a beamforming application-specific integrated circuit (“ASIC”) (e.g., ASIC 90), which connects to an interface controller (e.g., USB controller 100). EX1003, ¶¶9, 21-22, 29, claim 16 (“interface controller”). USB controller 100 provides digital information to a PDA through a standard digital interface (e.g., interface 150). *Id.*

Id. at 25.

We have reviewed Petitioner’s evidence and argument, and find that Petitioner has sufficiently shown that Halmann discloses this limitation of claim 1 for the purposes of institution.

[1b] “a main processing unit separate from said ultrasound transducer assembly and in communication therewith operable to receive said digital information from said ultrasound transducer assembly”

Petitioner contends Halmann discloses this limitation because Halmann discloses PDA 120 (e.g., main processing unit “modified to include ultrasound data processing and application software”) and is separated from the transducer assembly (e.g., probe assembly 2) by a standard digital interface (e.g., a USB cable). Pet. 25–26 (citing Ex. 1003, Abstract, ¶¶ 2, 8–10, 19, 22; Ex. 1008 ¶ 110). Petitioner further directs us to

Halmann's claim 17, which provides that the PDA includes software to perform ultrasound data processing functions demodulation; parameter estimation; scan conversion; and display processing. *Id.* at 26 (citing Ex. 1003, claim 17).

We have reviewed Petitioner's evidence and argument, and find that Petitioner has sufficiently shown that Halmann discloses this limitation of claim 1 for the purposes of institution.

[1c] "a digital data cable coupled between said ultrasound transducer assembly and said main processing unit carrying said digital information there between"

Petitioner contends Halmann discloses, or at least renders obvious, this limitation of claim 1. Pet. 27–30. More specifically, Petitioner argues that Halmann disclosed a digital data cable (e.g., USB cable) as distinguished from a "wireless interface." Pet. 28 (citing Ex. 1003 ¶ 22; Fig. 1B).

Separately, Petitioner argues that it would have been obvious to use a USB cable as digital interface 150, according to known methods to yield predictable results because a POSITA would have known that such cables were inexpensive, lightweight, flexible, widely available, and based on the well-known USB standard. *Id.* at 29–30 (citing Ex. 1008 ¶¶ 73–75, 113–115).

We have reviewed Petitioner's evidence and argument, and find that Petitioner has sufficiently shown that Halmann discloses this limitation of claim 1 for the purposes of institution.

[1d] “wherein said system is powered by a battery power source, wherein portions of the battery power source are distributed between the ultrasound transducer assembly and the main processing unit”

For these limitations, Petitioner argues that Halmann discloses

[a] “digital data cable” in paragraph 22, and immediately follows in paragraph 23 that this same embodiment may include an external or internal battery for the transducer assembly in addition to the battery in the PDA. EX1003, ¶¶18-23; EX1008, ¶¶118-19. Halmann further illustrates a digital data cable and distributed power source in the same block diagram, as shown in Figures 1 and 5 and further in the “realistic illustration” of Figure 1B. EX1003, Figs. 1, 1B, 5.

Pet. 31. Alternatively, Petitioner argues that

Coupling a transducer assembly to a battery-powered PDA using a standard USB cable was also known. Supra §§ VII.A.2, VIII.A.3; EX1008, ¶¶73-75, 122. A POSA would have been motivated to distribute a portion of the battery power source to the assembly in such a system based on known advantages of (1) increasing the battery power source capacity in the system, which allows for longer use times between having to recharge or replace batteries; (2) reducing the drain on the PDA battery from the assembly’s electronics; and (3) allowing a manufacturer to design a transducer assembly with a sufficient, reliable, and efficient power supply, without being limited by or dependent on the power capabilities of the main processing unit (e.g., PDA) that a user may connect to the assembly. Supra §§ VII.A.3, VII.D, VII.F; EX1008, ¶¶76-80, 123-25.

Pet. 33–34.

On this preliminary record, we agree with Petitioner’s contentions that Halmann teaches or suggests these limitations of claim 1 for the purposes of institution.

Conclusion

Accordingly, we determine that Petitioner has established a reasonable likelihood of prevailing on its assertions that claim 1 would have been anticipated and/or rendered obvious by Halmann.

2. *Independent claim 12 and dependent claims 2–6, 13, and 15*

The Petition outlines how Halmann teaches or suggests the features of independent claim 12, each one of claims 2–6 (which depend from independent claim 1), claims 13 and 15 (which depend from independent claim 12). Pet. 35–44.

Patent Owner does not offer arguments at this stage of the proceeding.

“When instituting *inter partes* review, the Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.” 37 C.F.R. § 42.108(a). We must “either (1) institute as to all claims challenged in the petition and on all grounds in the petition, or (2) institute on no claims and deny institution.” Patent Trial and Appeal Board Consolidated Trial Practice Guide (Nov. 2019) (“CTPG”)⁷, 5–6, 64. We “will not institute on fewer than all claims or all challenges in a petition.” *Id.* at 5, 64; *see also PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1359–60 (Fed. Cir. 2018) (stating a decision to institute is “a simple yes-or-no institution choice respecting a petition, embracing all challenges included in the petition”). Thus, because we have decided to grant institution on Grounds 1 and 2 against claim 1, we must do the same for independent claim 12 and dependent claims 2–6, 13, and 15.

⁷ Available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

F. Remaining Challenges

Combining with the teachings of Halmann, Petitioner asserts that (i) claims 1–6, 12, 13, and 15 would have been obvious based on the teachings of Halmann and Honda (Petitioner’s *Ground 3*), (ii) claims 2, 3, 5, 12, 13, and 15 would have been obvious based on the teachings of Halmann and Walston (Petitioner’s *Ground 4*), (iii) claims 2, 3, 5, 12, 13, and 15 would have been obvious based on the teachings of Halmann, Honda, and Walston (Petitioner’s *Ground 5*), (iv) claim 6 would have been obvious based on the teachings of Halmann and Smith (Petitioner’s *Ground 6*), and (v) claim 6 would have been obvious based on the teachings of Halmann, Honda, and Smith (Petitioner’s *Ground 7*). Pet. 3, 44–59.

Additionally, Petitioner asserts that claims 1–4, 6, 12, 13, and 15 would have been anticipated by Barnes (Pet. 3, 59–74, Petitioner’s *Ground 8*) and claims 1–6, 12, 13, and 15 would have been rendered obvious by Barnes (Pet 3, 59–74, Petitioner’s *Ground 9*).

Patent Owner does not offer arguments at this stage of the proceeding.

As we conclude that Petitioner demonstrates a reasonable likelihood of prevailing with respect to its anticipation and obviousness challenges (based on Halmann, i.e., Grounds 1 and 2) to independent claim 1, we institute review on all challenged claims on all grounds set forth in the Petition. *See SAS Institute Inc. v. Iancu*, 138 S. Ct. 1348, 1354 (2018); *PGS Geophysical AS*, 891 F.3d at 1360.

III. CONCLUSION

After considering the evidence and arguments presented in the Petition, we determine that Petitioner has demonstrated a reasonable likelihood of success in proving that at least one claim of the ’168 patent is

unpatentable. Accordingly, an *inter partes* review of claims 1–6, 12, 13, and 15 and all of the grounds presented in the Petition is hereby instituted. *See also PGS Geophysical AS*, 891 F.3d at 1360 (indicating that a decision whether to institute an *inter partes* review “requires a simple yes-or-no institution choice respecting a petition, embracing all challenges included in the petition”).

At this stage of the proceeding, the Board has not made a final determination as to the patentability of any challenged claim or any underlying factual or legal issues.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–6, 12, 13, and 15 of the ’168 patent is instituted with respect to all grounds set forth in the Petition;

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4(b), *inter partes* review of the ’168 patent shall commence on the entry date of this Order, and notice is hereby given of the institution of a trial.

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