

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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SHENZHEN ROOT TECHNOLOGY CO., LTD.,  
Petitioner,

v.

WILLOW BLOSSOM HOLDCO LIMITED  
and WILLOW INNOVATIONS, INC.,<sup>1</sup>  
Patent Owner.

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IPR2025-00554  
Patent 11,806,454 B2

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Before MEREDITH C. PETRAVICK, GRACE KARAFFA OBERMANN,  
and BARRY L. GROSSMAN, *Administrative Patent Judges*.

GROSSMAN, *Administrative Patent Judge*.

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

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<sup>1</sup> Willow Blossom Holdco Limited and Willow Innovations, Inc. (“Willow”) acquired the challenged patent from original patent owner Chiaro Technology Ltd. subsequent to the filing of the petition. *See* Paper 5, 2 (citing the first numbered page; the cover page is not numbered). The caption is updated to reflect this change of ownership.

## I. INTRODUCTION

### A. Background and Summary

Shenzhen Root Technology Co., Ltd. (“Petitioner” or “Shenzhen”) filed a Petition (Paper 2, “Pet.”) requesting an *inter partes* review of claims 17–19 and 21–33 (the “challenged claims”) of U.S. Patent No. 11,806,454 B2 (Ex. 1001, “the ’454 patent”).

Willow Blossom Holdco Limited and Willow Innovations, Inc. (collectively “Patent Owner” or “Willow”) *did not* file a Preliminary Response. Patent Owner did file, however, a request for discretionary denial under 35 U.S.C. §§ 325(d) and 314(a). Paper 7. This request was denied by the Acting Under Secretary of Commerce for Intellectual Property and Acting Director of the United States Patent and Trademark Office. Paper 9. This case was then “referred to the Board to handle the [case] in the normal course, including by issuing a decision on institution addressing the merits and other nondiscretionary considerations, as appropriate.” *Id.* at 2.

We have jurisdiction under 35 U.S.C. § 314. Under § 314, an *inter partes* review may not be instituted “unless . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a). The Board determines whether to institute a trial on behalf of the Director. 37 C.F.R. § 42.4(a).

Petitioner has the burden of proof. *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (“In an IPR, the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.”). The fact that Patent Owner did not file a Preliminary Response does not affect or change Petitioner’s burden of proof.

After considering the Petition and the evidence of record, based on the analysis in this Decision, we determine that Petitioner has demonstrated that there is a reasonable likelihood that at least one of the challenged claims is unpatentable. Accordingly, we institute an *inter partes* review of all challenged claims and on all grounds asserted in the Petition. *PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1360 (Fed. Cir. 2018) (stating that a decision to institute is “a simple yes-or-no institution choice respecting a petition, embracing all challenges included in the petition”).

*B. Real Parties-in-Interest*

Petitioner identifies itself as a real party-in-interest. Pet. 103. Petitioner states that Petitioner also was known as “Shenzhen Lutejiacheng Network Technology Co., Ltd., which changed its name to Shenzhen Lute Innovation Technology Co., Ltd., in September 2023.” *Id.* In addition to itself, Petitioner states that the following companies also are real parties-in-interest: Hong Kong Lute Technology Co., Ltd.; Shenzhen Conglin E-Commerce Co., Ltd.; Shenzhen Jinruihang Technology Co, Ltd.; Shenzhen Xitao Network Technology Co., Ltd.; and ROOT Technology Ltd. *Id.* at 104

Patent Owner identifies Willow Blossom Holdco Limited and Willow Innovations, Inc. as the real parties-in-interest. Paper 5, 2.

*C. Related Matters*

The parties indicate that the ’454 patent is the subject of the following district court proceeding: *Shenzhen Root Technology Co., Ltd. v. Chiaro Technology, Ltd.*, case no. 2-23-cv-00631 (WAWD). Pet. 104; Paper 5, 2. This case has been stayed by Order of the U. S. Bankruptcy Court for the District of Delaware. *See* Ex. 1027 (“Suggestion of

Bankruptcy” filed in the related litigation); Ex. 3001 (“Joint Status Report” filed in the related litigation) (including attached Order (Ex. A) automatically staying the Western District of Washington District Court litigation).

We note as related matters that the same parties are involved in pending IPR2025-00560 and IPR2024-01296, which also involve breast pump technology.

*D. The '454 patent*

The '454 patent is titled “Wearable Breast Pump System.” Ex. 1001, code (54). The disclosed technology relates to “a wearable, electrically powered breast pump system for extracting milk from a mother.” *Id.* at 1:21–23.<sup>2</sup> Breast pumps often augment or replace nursing a baby for many reasons. Ex. 1003 ¶ 34. “They can be used to address milk supply (either under or over-supply), separation of the mother-baby dyad, milk elimination, building stored milk reserves, donation (i.e., milk banking), breast mastitis, etc.” *Id.*

Breast pump systems, in general, are well-known, as disclosed in the '454 patent. *Id.* at 1:30–2:4. These known systems include fully integrated wearable breast pump systems. *Id.* at 2:7–8.

As stated in the '454 patent, in the known, fully integrated wearable systems:

there is a need for an improved way to provide an easy and flexible connection between a suction tube and a wearable milk collection device. There is also a need to provide an unobstructed view of the interior chamber of the wearable milk collection device, in order to achieve a correct nipple alignment and to

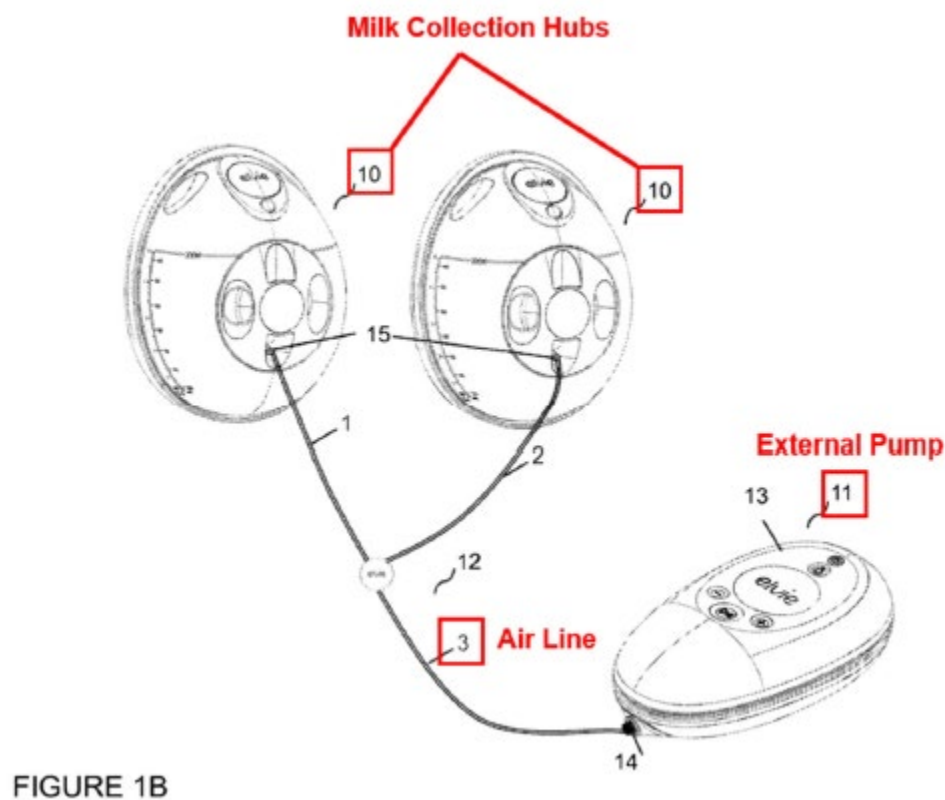
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<sup>2</sup> Citations to the '454 patent are in the format of column:line(s).

ensure the system is properly operating, such that milk is entering the interior of the device.

*Id.* at 2–5–12.

Figure 1A shows a wearable breast pump system, made up of a pair of milk collection hubs 10, an air line 12 and a separate combined control and air pump unit 11 that is external to the milk collection hubs. Ex. 1001, 2:59–62. Figure 1B, annotated by Mr. Ryan Bauer, Petitioner’s proffered expert witness (Ex. 1003 ¶ 54), is reproduced below and shows the wearable breast pump system with the milk collection hubs connected via the air line to the combined control and air pump unit. Ex. 1001, 2:63–65.



Figures 2 and 3 from the '454 patent, annotated by Mr. Bauer (Ex. 1003 ¶¶ 55, 57), are reproduced below.

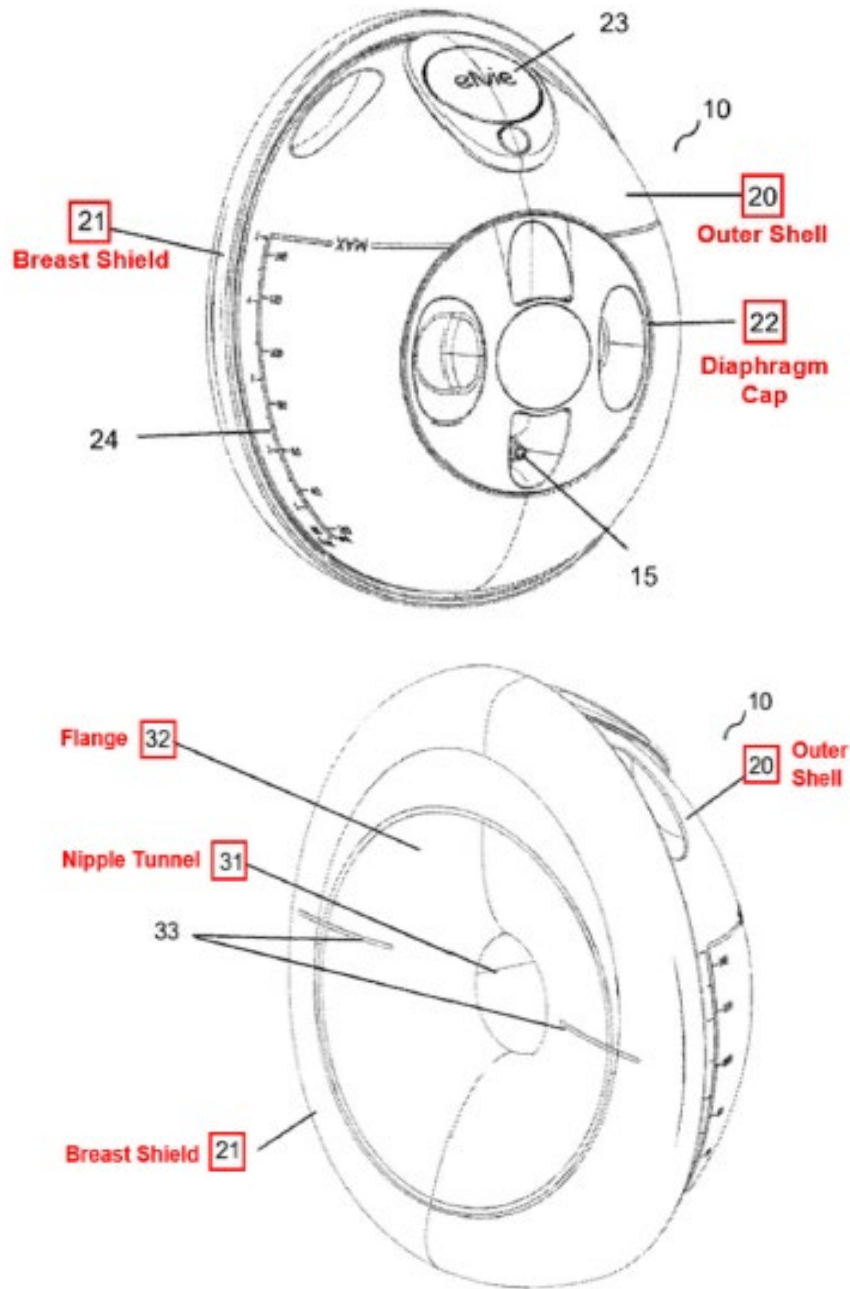


Figure 2 (on top) and Figure 3 (below Figure 2) show a perspective front view and rear view, respectively, of milk collection hub 10. Ex. 1001, 2:66–3:2.

As shown in the Figures 2 and 3,

milk collection hubs 10 are both identical and are configured to be discreet and to be comfortably held inside a bra, with the outer shell 20 having a curved shape that is configured to contact the inner surface of the bra. The outer shell 20 fits or latches onto a breast shield 21 that forms the rear surface of the hub 10. The breast shield 21 is made up of a breast flange 32 and a nipple tunnel 31; the interior volume between the outer shell 20 and the breast shield 21 defines a chamber in which milk is collected. The breast flange 32 contacts the user's breasts. The outer shell 20 is directly removable from the breast shield in normal use or normal dis-assembly to enable cleaning of the interior volume in which milk is collected.

Ex. 1001, 5:41–53.

Figure 6 from the '454 patent, annotated by Mr. Bauer (Ex. 1003 ¶ 56), is reproduced below.

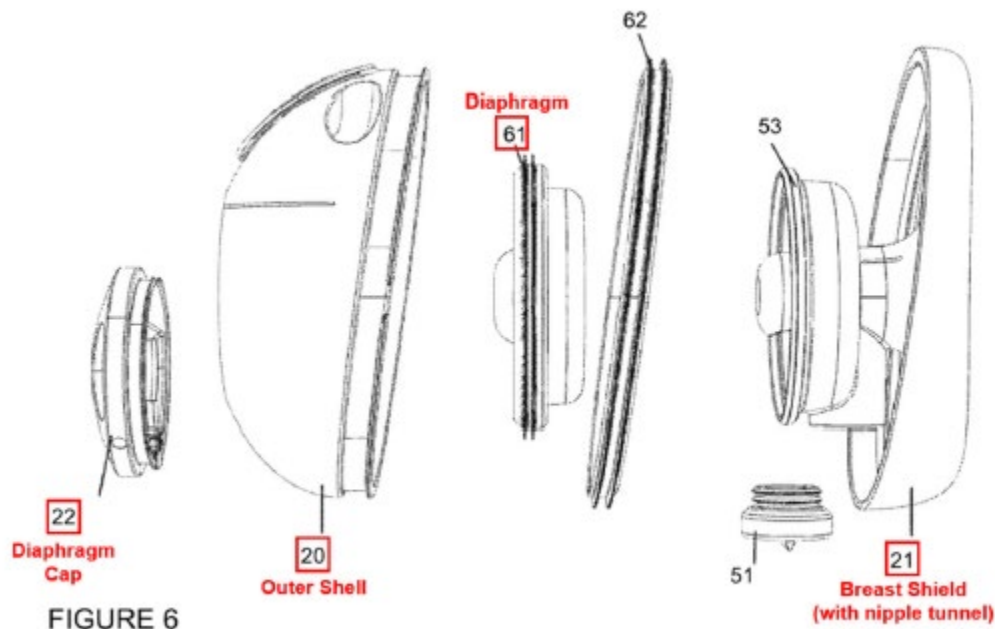


Figure 6 is an exploded view of the milk collection hub. Ex. 1001, 3:6. As shown in Figure 6, wearable milk collection hub 10 further includes breast shield 21, outer shell 20, diaphragm 61 and diaphragm cap 22.

*Id.* at 8:22–26. Diaphragm cap 22 forms “an air-tight seal to the flexible diaphragm 61.” *Id.* at 8:26–27. An air tight seal between breast shield 21 and outer shell 20 is provided by removable seal member 62. *Id.* at 8:27–29.

In operation, once the system is activated, a pumping cycle begins: The air-pressure pump turns on and creates negative air pressure during a first phase of the pumping cycle, referred to as pumping time (P).

*Id.* at 13:9–12. When negative air pressure is applied to milk collection hubs 10, flexible diaphragm 61 flexes and negative air pressure is conveyed to the inside of nipple tunnel 31, to pull the breast and/or nipple, thus drawing milk from the nipple. *Id.* at 13:12–15. During this first phase of pumping cycle (P), air-pressure pump 161 is configured to be on for a pre-defined amount of time in order to provide a target negative air pressure. *Id.* at 13:15–18.

After the target negative air pressure has been reached, air-pressure pump 161 turns off, and air is bled into the system via solenoid valve 162 during the second phase of the pumping cycle, referred to as bleed time (B). *Id.* at 13:20–25. At the end of the bleed time, the system is therefore reset to ambient pressure. *Id.*

#### *E. Illustrative Claim*

The '454 patent contains 33 claims. Claims 1, 8, 17, and 28 are independent claims. Independent claims 1 and 8 are directed to a “wearable milk collection hub.” *E.g., see id.* at 23:51 (for claim 1). Independent claims 17 and 28 are directed to a “breast pump system.” *E.g., see id.* at 25:17 (for claim 17). Petitioner challenges only the “breast pump system” claims, claims 17–19 and 21–33. Claim 17 is illustrative, and is

reproduced below in Petitioner’s chart with bracketed labels employed by Petitioner to facilitate analysis and discussion. *See* Pet. v.

| Claim 17 |                                                                                                                                                                                                                             |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [17pre]  | A breast pump system comprising:                                                                                                                                                                                            |
| [17a-1]  | a control unit comprising:                                                                                                                                                                                                  |
| [17a-2]  | a battery, and                                                                                                                                                                                                              |
| [17a-3]  | a pump configured to be powered by the battery and to generate negative air pressure; and                                                                                                                                   |
| [17b]    | a wearable milk collection hub configured to connect to the control unit via an air line, the wearable milk collection hub comprising:                                                                                      |
| [17c-1]  | a breast shield comprising:                                                                                                                                                                                                 |
| [17c-2]  | a breast flange; and                                                                                                                                                                                                        |
| [17c-3]  | a nipple tunnel extending from the breast flange;                                                                                                                                                                           |
| [17d]    | a diaphragm configured to deform based on the negative air pressure generated by the pump to create negative air pressure in the nipple tunnel;                                                                             |
| [17e]    | an outer shell comprising a rear end configured to removably attach to the breast shield and, an interior volume between the outer shell and the breast shield defining a chamber to receive expressed milk; and            |
| [17f]    | a diaphragm cap configured to cover and seal the diaphragm at a front end of the outer shell, the front end being opposite to the rear end, the diaphragm cap forms a central region on a front surface of the outer shell. |

Ex. 1001, 71:45–60.

Independent claim 28 is substantially similar to claim 17. It differs primarily in that claim 28 states “at least a part of the diaphragm is arranged concentric with the nipple tunnel,” which is not included in claim 17. *See* Ex. 1001, 26:34–36.

*F. Prior Art and Asserted Grounds*

Petitioner asserts that one or more of the challenged claims would have been obvious on the following twelve grounds:

| <b>Claim(s) Challenged</b>            | <b>35 U.S.C. §<sup>3</sup></b> | <b>Reference(s)/Basis</b>        |
|---------------------------------------|--------------------------------|----------------------------------|
| 17, 18, 21, 22, 24, 25, 27, 28, 30–32 | 103                            | Furrer                           |
| 17, 18, 21, 22, 24, 25, 27, 28, 30–32 | 103                            | Furrer, Alvarez                  |
| 17–19, 21–25, 27–32                   | 103                            | Furrer, Alvarez, Pollen          |
| 22, 31                                | 103                            | Furrer, Alvarez, Pollen, Weniger |
| 25                                    | 103                            | Furrer, Alvarez, Pollen, Rigert  |
| 26, 33                                | 103                            | Furrer, Alvarez, Pollen, Kasting |
| 17–19, 21, 23, 24, 27–30, 32          | 103                            | Park, Silver                     |
| 22, 31                                | 103                            | Park, Silver, Weniger            |
| 25, 27–30, 32                         | 103                            | Park, Silver, Rigert             |
| 31                                    | 103                            | Park, Silver, rigert, Weniger    |
| 26, 33                                | 103                            | Park, Silver, Kasting            |
| 33                                    | 103                            | Park, Silver, Rigert, Kasting    |

Petitioner also relies on the Declaration testimony of Mr. Ryan Bauer. *See* Ex. 1003.<sup>4</sup> Petitioner refers to the “Furrer” based grounds as Grounds

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<sup>3</sup> The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 296–07 (2011), took effect on September 16, 2011. The changes to 35 U.S.C. §§ 102 and 103 in the AIA do not apply to any patent application filed before March 16, 2013. Because the application for the patent at issue in this proceeding was filed after March 16, 2013, we refer to the AIA version of the statute.

<sup>4</sup> Mr. Bauer earned a Bachelor’s degree in Mechanical Engineering and a Master’s degree in Product Development. Ex. 1003 ¶ 4. He currently is a Director of Medical Device & Pharmaceutical Solutions at Siemens AG. Ex. 1006, 1 (Mr. Bauer’s CV). His experience in research is summarized in his CV. *See id.* at 1–4. Mr. Bauer has experience in engineering analysis and project management of breast pumps and accessories (*id.* at 3), managed

1A–1F. Pet. 1A–1F. Petitioner refers to the “Park, Silver” based grounds as Grounds 2A–2F. Petitioner provides the following chart identifying each of the asserted references.

| Reference                 | Filing Date   | Publication Date |
|---------------------------|---------------|------------------|
| US 10,149,929 (Furrer)    | Dec. 12, 2013 | Dec. 1, 2018     |
| US 2015/0283311 (Alvarez) | Feb. 6, 2015  | Oct. 8, 2015     |
| US 2015/0217035 (Pollen)  | Apr. 14, 2015 | Aug. 6, 2015     |
| US 2004/0087898 (Weniger) | Nov. 1, 2002  | May 6, 2004      |
| US 2018/0021491 (Rigert)  | Feb. 9, 2016  | Jan. 25, 2018    |
| US 7,677,423 (Kasting)    | Feb. 14, 2006 | Mar. 16, 2010    |
| PCT WO2016/186452 (Park)  | May 18, 2016  | Nov. 24, 2016    |
| US 2011/0071466 (Silver)  | Sep. 17, 2010 | Mar. 24, 2011    |

## II. ANALYSIS

### A. Legal Standards

Section 103 forbids issuance of a patent when “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406

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a product development department within the breastfeeding business to support new product initiatives (*id.* at 2), and was responsible for development of new strategic breast pump architecture and global product launch (*id.*).

(2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when available, evidence such as commercial success, long felt but unsolved needs, and failure of others.<sup>5</sup> *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966); see *KSR*, 550 U.S. at 407 (“While the sequence of these questions might be reordered in any particular case, the [*Graham*] factors continue to define the inquiry that controls.”). The Court in *Graham* explained that these factual inquiries promote “uniformity and definiteness,” for “[w]hat is obvious is not a question upon which there is likely to be uniformity of thought in every given factual context.” 383 U.S. at 18.

The Supreme Court made clear that we apply “an expansive and flexible approach” to the question of obviousness. *KSR*, 550 U.S. at 415. Whether a patent claiming the combination of prior art elements would have been obvious is determined by whether the improvement is more than the predictable use of prior art elements according to their established functions. *Id.* at 417. To support this conclusion, however, it is not enough to show merely that the prior art includes separate references covering each separate limitation in a challenged claim. *Unigene Labs., Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1360 (Fed. Cir. 2011). Rather, obviousness additionally requires that a person of ordinary skill at the time of the invention “would have selected and combined those prior art elements in the normal course of research and development to yield the claimed invention.” *Id.*

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<sup>5</sup> There is no objective evidence of non-obviousness on the evidentiary record before us.

In determining whether there would have been a motivation to combine prior art references to arrive at the claimed invention, it is insufficient to simply conclude the combination would have been obvious without identifying any reason *why* a person of skill in the art would have made the combination. *Metalcraft of Mayville, Inc. v. Toro Co.*, 848 F.3d 1358, 1366 (Fed. Cir. 2017).

Moreover, in determining the differences between the prior art and the claims, the question under 35 U.S.C. § 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. *Litton Indus. Prods., Inc. v. Solid State Sys. Corp.*, 755 F.2d 158, 164 (Fed. Cir. 1985) (“It is elementary that the claimed invention must be considered as a whole in deciding the question of obviousness.”); *see also Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1537 (Fed. Cir. 1983) (“[T]he question under 35 U.S.C. § 103 is not whether the differences *themselves* would have been obvious. Consideration of differences, like each of the findings set forth in *Graham*, is but an aid in reaching the ultimate determination of whether the claimed invention *as a whole* would have been obvious.”).

As a factfinder, we also must be aware “of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning.” *KSR*, 550 U.S. at 421.

Applying these general principles, we consider the evidence and arguments before us, recognizing Petitioner’s burden.

#### *B. Level of Ordinary Skill in the Art*

The level of skill in the art is “a prism or lens” through which we view the prior art and the claimed invention. *Okajima v. Bourdeau*, 261 F.3d

1350, 1355 (Fed. Cir. 2001). “This reference point prevents . . . factfinders from using their own insight or, worse yet, hindsight, to gauge obviousness.” *Id.*

“The *Graham* analysis includes a factual determination of the level of ordinary skill in the art. Without that information, a . . . court cannot properly assess obviousness because the critical question is whether a claimed invention would have been obvious at the time it was made to one with ordinary skill in the art.” *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986); *see also Ruiz v. A.B. Chance*, 234 F.3d 654, 666 (Fed. Cir. 2000) (“The determination of the level of skill in the art is an integral part of the *Graham* analysis.”).

Factors pertinent to a determination of the level of ordinary skill in the art include: (1) educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of workers active in the field. *Env’t Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 696–697 (Fed. Cir. 1983) (citing *Orthopedic Equip. Co. v. All Orthopedic Appliances, Inc.*, 707 F.2d 1376, 1381–82 (Fed. Cir. 1983)). Not all such factors may be present in every case, and one or more of these or other factors may predominate in a particular case. *Id.* Moreover, these factors are not exhaustive but are merely a guide to determining the level of ordinary skill in the art. *Daiichi Sankyo Co. v. Apotex, Inc.*, 501 F.3d 1254, 1256 (Fed. Cir. 2007). In determining a level of ordinary skill, we also may look to the prior art, which may reflect an appropriate skill level. *Okajima*, 261 F.3d at 1355.

Petitioner asserts that a person of ordinary skill in the art would have had “bachelor’s degree in mechanical engineering or a similar field and at least two years of experience designing human breast pump equipment. More education could substitute for experience and vice versa.” Pet. 3–4 (citing Ex. 1003 ¶¶ 30–33).

Mr. Bauer’s Declaration testimony states he considered some of the factors listed above. Ex. 1003 ¶ 32. Mr. Bauer testifies that based on his background and experience, in his opinion, the level of ordinary skill is as stated by Petitioner. *Id.* at 33.

For purposes of this Decision, based on the prior art, the sophistication of the disclosed technology in the ’381 patent, and Mr. Bauer’s undisputed testimony, we adopt Petitioner’s definition of the level of ordinary skill.<sup>6</sup>

### *C. Claim Construction*

We construe each claim “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. [§] 282(b).” 37 C.F.R. § 42.100(b) (2021). Under this standard, claim terms are generally given their ordinary and customary 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, 1312–14 (Fed. Cir. 2005) (en banc) (“We have

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<sup>6</sup> Any determination, no matter how designated in this decision (except our determination to institute an *inter partes* review), is preliminary and non-binding. We wait to have the record fully developed before reaching any binding determination, finding, or conclusion.

frequently stated that the words of a claim ‘are generally given their ordinary and customary meaning.’” (citations omitted)).

Petitioner asserts that “[a]ll claim terms should be construed according to the *Phillips* standard,” and that “no formal claim constructions are necessary for purposes of resolving controversies in this proceeding.

Pet. 3. We agree.

Given the lack of dispute on this record, we do not perceive the need to construe any claim limitation. Claims must be construed “only to the extent necessary to resolve the controversy.” *AstraZeneca AB v. Mylan Pharms. Inc.*, 19 F.4th 1325, 1345 (Fed. Cir. 2021) (quoting *Vivid Techs., Inc. v. American Science & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999); see also *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (“Because we need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy,’ we need not construe the claim preambles here where the construction is not ‘material to the [obviousness] dispute.’” (citations omitted))).

Any claim discussion in this Decision does not preclude the parties from arguing their proposed constructions of the claims during trial. Indeed, the parties are hereby given notice that final claim construction, in general, is an issue to be addressed at trial. Claim construction will be determined at the close of all the evidence and after any hearing. The parties are expected to assert all their claim construction arguments and evidence in the Petition, Patent Owner’s Response, or otherwise during trial, as permitted by our rules.

III. GROUNDS 1A, 1B<sup>7</sup>  
CLAIMS 17, 18, 21, 22, 24, 25, 27, 28, 30–32  
IN VIEW OF FURRER, ALVAREZ

Grounds 1A and 1B each challenge the same claims. Ground 1A relies solely on Furrer. Pet. 7–29. Ground 1B relies on Furrer and Alvarez. *Id.* at 29–34.

The difference between these two grounds is that Ground 1A relies on the Declaration testimony of Mr. Bauer to establish that adding the missing element of a “control unit comprising a battery and a pump configured to be powered by the battery to generate negative air pressure,” would have been obvious, whereas Ground 1B relies on Alvarez for the disclosure of this limitation, and relies on Mr. Bauer’s testimony only for his opinion that adding the controller/pump/battery configuration of Alvarez to the system of Furrer would have been obvious to a person of ordinary skill.<sup>8</sup>

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<sup>7</sup> For consistency with the identification of the asserted grounds and Petitioner’s arguments, we use Petitioner’s alpha-numeric identification of the asserted grounds. As shown in the chart in Section I.F of this Decision, there are twelve distinct asserted grounds.

<sup>8</sup> On July 31, 2025, the United States Patent and Trademark Office (USPTO) issued a memo stating it will enforce and no longer waive the requirement of 37 C.F.R. § 42.104(b)(4) that a petition for *inter partes* review “must specify where each element of the claim is found in the prior art patents or printed publications relied upon.” *See* [https://www.uspto.gov/sites/default/files/documents/aapa\\_memo\\_final\\_signed.pdf](https://www.uspto.gov/sites/default/files/documents/aapa_memo_final_signed.pdf). As a practical matter, this means that applicant admitted prior art, expert testimony, common sense, and other evidence that is not “prior art consisting of patents or printed publications” may not be used to supply a missing claim limitation. This Memorandum applies to any petition for IPR filed on or after September 1, 2025. Because the Petition in the case before us was filed on March 6, 2025 (*see* Paper 3), the July 31 Memo does *not* apply to this case.

First, we summarize the disclosures of Furrer and Alvarez.

*A. Furrer (Ex. 1004)*

Furrer is titled “Breast Shield Unit with Media Separation.” Ex. 1004, code (54). Furrer discloses a “breastshield unit,” for use with a “breastpump” for expressing human breastmilk. Ex. 1004, 1, 59–60. The disclosed “breastshield unit” is designed for receiving a mother's breast and a “media separation device for transferring a vacuum into the interior of the breastshield.” *Id.* at 1:61–63.

Figures 3 and 4 from Furrer, annotated by Petitioner (Pet. 7), are reproduced below.

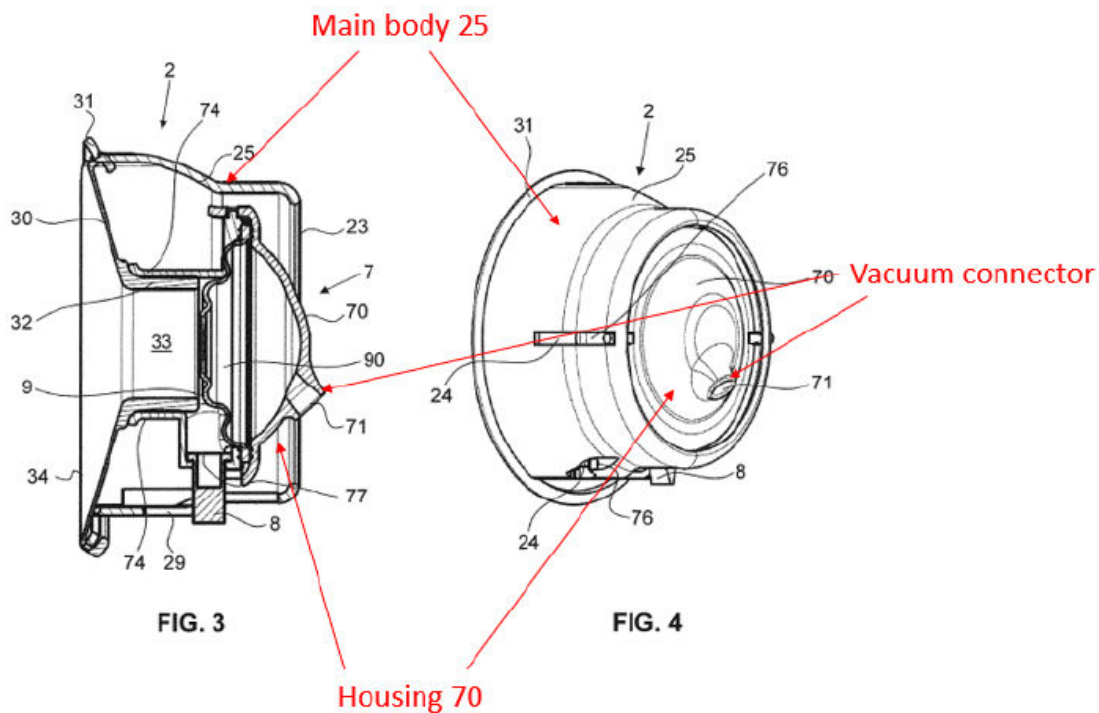


Figure 3 is a longitudinal section view through a breastshield unit. Ex. 1004, 4:27–31. Figure 4 is a perspective view of the breastshield unit. *Id.* at 4:32–33.

As shown in the annotated figures, and as described in Furrer (*Id.* at 4:57–5:58), breastshield 2 has a dimensionally stable or stiff main body 25. “Media separation” device 7, shown as membrane 9, is held in main body 25. Main body 25 includes milk attachment part 28 with a milk outlet opening, which serves for connection to a milk collection container 5 (shown in Figures 1 and 2). Breastshield insert 3 includes breast pad 30. Breast pad 30 serves the purpose of being placed onto a mother's breast, with the nipple of the breast extending into stub 32.

Vacuum connector 71 for connection to a vacuum pump (not shown) is present on the housing 70 of the media separation device 7. Furrer discloses that this connection can be made directly or by a suction line. Furrer also discloses that the vacuum pump can be driven manually or by motor.

Based on the disclosed structure and system, a milk flow path is formed through which expressed breast milk can pass from receiving area 33 through the milk outlet opening 77, valve 8 and milk outlet 28 of main body 25 into milk collection container 5.

*B. Alvarez (Ex. 1005)*

Alvarez is titled “Method, Apparatus, and System for Expression of Human Breast Milk.” Ex. 1005, code (54). Figure 1 from Alvarez is reproduced below.

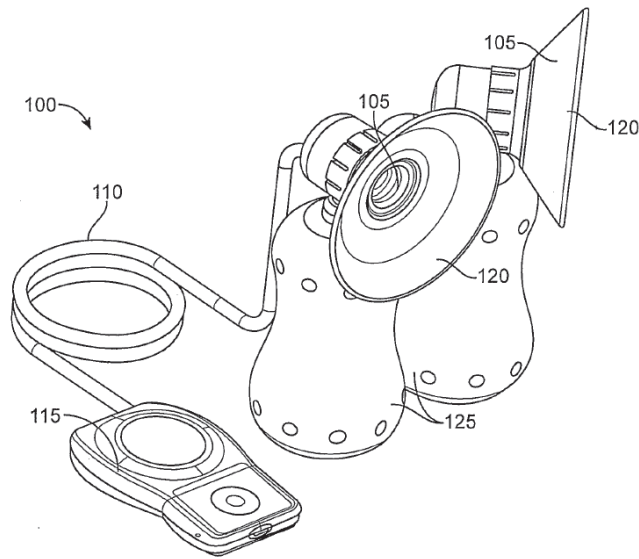


Figure 1 from Alvarez is a perspective view of the disclosed system for the expression and collection of human breast milk. Ex. 1005 ¶¶ 44, 67. As shown, Alvarez discloses:

Pumping device 100 (also known as an “expression apparatus”) includes breast interfaces 105, a tube 110, and a controller 115 (sometimes also referred to as a “pendant unit”) operatively coupled to breast interfaces 105 through tube 110. Breast interfaces 105 include resilient and conformable flanges 120, for engaging and creating a fluid seal against the breasts, and collection vessels 125.

*Id.* ¶ 69.

Alvarez also discloses that “[c]ontroller 115 houses the power source and drive mechanism for pumping device 100, and also contains hardware for various functions, such as controlling pumping device 100, milk production quantification, and communication with other devices.” *Id.* Additionally, Alvarez discloses that tube 110 transmits suitable energy inputs, such as mechanical energy inputs, from controller 115 to breast interfaces 105. *Id.* Breast interfaces 105 convert the energy inputs into

vacuum pressure against the breasts, resulting in the expression of milk into collection vessels 125. *Id.*

*C. Analysis of Independent Claim 17*

In Ground 1A, Petitioner provides a clause-by-clause analysis of independent claim 17 mapping each element or limitation of claim 17 to what Petitioner asserts is the corresponding disclosure in Furrer. Pet. 9–21.

Throughout its analysis of claim 17, Petitioner cites to the written description and drawings of Furrer and to the Declaration testimony of Mr. Bauer for evidentiary support. *Id.*

*1. Claim 17*

*a) [17pre] A breast pump device comprising:*

Petitioner asserts that “[t]o the extent the preamble is limiting, Furrer describes ‘a breastshield unit for use with a breastpump for expressing human breastmilk.’” Pet. 10 (citing Ex. 1004, 1:16–18, 4:57–6:17; Ex. 1003, ¶¶ 61–63, 88–89). Based on the record before us, we agree. There can be no reasonable dispute that Furrer discloses a breast pump device, as asserted by Petitioner.

*b) [17a-1]-[17a-3] a control unit comprising: a battery, and a pump configured to be powered by the battery and to generate negative air pressure; and:*

Petitioner asserts that Furrer’s breast pump system includes “[a] vacuum connector 71 for connection to **a vacuum pump** (not shown)” via “a suction line.” *Id.* at 10 (citing Ex. 1004, 5:37–62 (emphasis added by Petitioner)). Petitioner also asserts “Furrer’s vacuum pump is motorized (‘can be driven ... by motor’) and applies ‘cyclically changing underpressure’ via the vacuum connector 71.” *Id.* (citing 5:40–41 and 59–

62). Based on this disclosure, Petitioner asserts “a POSITA would have recognized that this motorized vacuum pump would have included, or at least plainly suggested, a conventional pump control unit so as to safely and repeatably achieve Furrer’s ‘cyclically changing’ negative pressure from the disclosed vacuum pump. Pet. 10 (citing Ex. 1003 ¶¶ 90–93; Ex. 1004, 5:40–41; 59–62). Additionally, Petitioner asserts that “this suggestion in Furrer is fully consistent with Furrer’s explanation that such ‘motor-driven breastpumps are commercially available.” *Id.* at 11 (citing Ex. 1004, 1:22–33). Based on these assertions, Petitioner concludes that “Furrer discloses or renders obvious the claimed control unit. *Id.* (citing Ex. 1003 ¶ 90).

Mr. Bauer testifies that a “POSITA would have recognized that such ‘motor driven breastpumps’ that would have served as the motor driven vacuum pump in Furrer’s system are, or at least plainly suggest, control units.” Ex. 1003 ¶ 90.

Mr. Bauer also testifies that:

Furrer does not expressly state that its electric pump includes and is “powered by” a “battery.” However, this would have been obvious to a POSITA based on Furrer’s disclosure alone. In particular, as discussed above, Furrer discloses that its vacuum pump is motorized and of the type of motor-driven pumps that were commercially available at the time. There were only two power sources available for commercially-available motor-driven pumps at the time, as was well-known to a POSITA: those powered by a power cord that plugs into an outlet and battery power.

*Id.* ¶ 92.

In Ground 1B, relying on Furrer and Alvarez, Petitioner asserts for these same clauses [17a-1]-[17a-3] that Alvarez expressly discloses use of a battery as a power source. Pet. 33. Petitioner concludes it would have been

obvious to use the battery suggested by Alvarez “to provide the claimed control unit comprising the battery and pump to generate negative air pressure.” *Id.*

Mr. Bauer further testifies:

For electric-powered breast pumps, the only two options for providing electricity to the pump was either via a wire plugged into an outlet or via a battery, as would have been well-known to a POSITA. It would have been obvious for a POSITA to utilize a battery as the power source for Furrer’s pump as it was one of the two available options and would have provided known benefits.

Ex. 1003 ¶ 93. As to why this a person of ordinary skill would have chosen the option of a battery powered breast pump, Mr. Bauer testifies that:

Selection of battery power for Furrer’s pump would have beneficially provided a portable system that was usable during travel. Additionally, such a configuration would have allowed the user to move freely about a room, or be positioned in a location within a room without being tethered to a wall plug, allowing the user to, for example, sit or lay in the most convenient location while using the system without having to worry about being close to an outlet. Such mobility provided by selecting battery power for Furrer’s pump would have particularly aligned with Furrer’s suggestion for a ‘hands-free’ and discrete solution.

*Id.* (internal citations omitted); *see also* Ex. 1003 ¶¶ 138, 143, 145 (further discussing the motivation to combine Furrer and Alvarez in the context of Ground 1B).

Based on the record before us, without any evidence or argument to the contrary, we determine that Petitioner shows sufficiently for purposes of trial institution that Furrer, alone or in combination with Alvarez, discloses the claimed control unit comprising a battery, and a pump.

*c) [17b] a wearable milk collection hub configured to connect to the control unit via an air line, the wearable milk collection hub comprising:*

Petitioner asserts Furrer discloses the claimed wearable milk collection hub in the form of breastshield 2, shown in Figures 3 and 4, in which the breastshield is worn in a bra under the clothes. Pet. 12 (citing Ex. 1004, 1:47–52, 3:5–10 (“...worn under a bra”), 7:25–31; Ex. 1003 ¶¶ 94–96.

Regarding the claimed “air line,” Petitioner asserts Furrer’s device forms “[a] milk flow path...through which expressed breast milk can pass from the receiving area 33 through the milk outlet opening 77...into the milk collection container 5.” *Id.* at 12–13 (citing Ex. 1004, 5:43–49). Furrer’s system includes “[a] vacuum connector 71 for connection to a vacuum pump (not shown)” via “a suction line.” *Id.* at 13 (citing Ex. 1004, 5:37–40).

Based on the record before us, we agree that Furrer discloses a wearable collection hub and air line, as stated in claim 1.

*d) [17c-1]-[17c-3] a breast shield comprising: a breast flange; and a nipple tunnel extending from the breast flange;*

Petitioner asserts Furrer discloses the claimed breast shield in the form of “breastshield insert 3 having breast pad 30 (the claimed breast flange) and stub 32 that extends from the breast pad 30 and defines a ‘receiving area 33 for receiving the nipple’ (the claimed nipple tunnel).” Pet. 13 (citing Ex. 1004, 5:11–34, annotated Figs 1, 3; Ex. 1003 ¶¶ 97–100).

Based on the record before us, we agree with this analysis for purposes of this Decision.

*e) [17d] a diaphragm configured to deform based on the negative air pressure generated by the pump to create negative air pressure in the nipple tunnel;*

Petitioner asserts that Furrer's media separation membrane 9 provides the claimed diaphragm. Pet. 14 (citing Ex. 1004, 5:50–6:17; Ex. 1003 ¶¶ 101–103.

Mr. Bauer testifies that Furrer describes the membrane 9 functions to ensure that a cyclically changing “underpressure” applied via the vacuum connector 71 is transferred into the [nipple] receiving area 33. Ex. 1003 ¶ 103 (citing Ex. 1004, 5:59–6:12).

Based on the record before us, we agree with this analysis for purposes of this Decision.

*f) [17e] an outer shell comprising a rear end configured to removably attach to the breast shield and, an interior volume between the outer shell and the breast shield defining a chamber to receive expressed milk; and.*

Petitioner asserts, and Patent Owner does not dispute at this juncture, that Furrer's main body 25 in combination with housing 70 provides the claimed outer shell. Pet. 16–19 (citing Ex. 1004, 5:11–24; Ex. 1003 ¶¶ 104–109. Petitioner illustrates its mapping of Furrer's disclosure to the elements and limitations of this clause 17e with several annotated figures from Furrer and the '454 patent.

On this record, we agree with Petitioner's assertions.

*g) [17f] a diaphragm cap configured to cover and seal the diaphragm at a front end of the outer shell, the front end being opposite to the rear end, the diaphragm cap forms a central region on a front surface of the outer shell.*

Petitioner asserts Furrer's housing 70 provides the claimed diaphragm cap that forms a central region on a front surface of the outer shell. Pet. 19–

21 (citing Ex. 1004, 4:57–63, 5:35–58, 6:8–12, 6:24–30; Ex. 1003 ¶¶ 110–116). Petitioner again relies on several annotated figures to illustrate its assertions.

On this record, we agree with Petitioner’s assertions.

*h) Conclusion for Claim 17*

Based on the arguments and evidence in the record before us, we determine, for purposes of this Decision, Petitioner has established a reasonable likelihood that independent claim 17 is unpatentable based on Furrer (Ground 1A) and Furrer and Alvarez (Ground 1B).

*D. Remaining Claims and Grounds*

We have determined that Petitioner has established a reasonable likelihood that it will prevail in establishing that at least one claim is unpatentable. Accordingly, we institute an *inter partes* review on all asserted grounds for all asserted claims. *PGS Geophysical*, 891 F.3d at 1360.

As stated above, Patent Owner did not file a preliminary response addressing the merits of any of the challenged claims. Thus, there is no contrary argument or evidence rebutting Petitioner’s assertions and supporting evidence. We make no adverse presumptions against Patent Owner’s choice to forgo a preliminary response addressing the merits of the Petition’s challenges to patentability. As stated above, whether or not Patent Owner files a preliminary response, or any response, Petitioner has the burden of proving its case.

Rather than discuss each challenged claim and each asserted ground, we determine that the preferred procedure in this case is to await any response Patent Owner may choose to file.

#### IV. CONCLUSION

We have determined that there is a reasonable likelihood that Petitioner will prevail on at least one challenged claim. Accordingly, we institute an *inter partes* review on all challenged claims on each asserted ground.

Our initial review of the Petition under 35 U.S.C. § 314 is not to determine whether an individual asserted fact is indisputable or whether a preponderance of the evidence supports Petitioner. Our initial review is to determine whether the totality of the information presented in the Petition shows that there is a reasonable likelihood that Petitioner would prevail with respect to at least one of the claims challenged in the Petition. “The ‘reasonable likelihood’ standard is a somewhat flexible standard that allows the Board room to exercise judgment.” Patent Trial and Appeal Board Consolidated Trial Practice Guide at 53 (Nov. 2019), *available at* <https://www.uspto.gov/sites/default/files/documents/tpgnov.pdf>.

This is a decision to institute an *inter partes* review under 35 U.S.C. § 314. Our determinations at this stage of the proceeding are preliminary and based on the evidentiary record developed thus far. This is not a final decision as to the patentability of claims for which *inter partes* review is instituted. Any final decision will be based on the record as fully developed during trial, including all arguments and evidence in the Patent Owner’s Response, or submitted otherwise during trial, as permitted by our rules.

#### V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), *inter partes* review is instituted as to claims 17–19, 21–33 of the '454 patent on each ground set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4(b), *inter partes* review of the '454 patent shall commence on the entry date of this Decision, and notice is hereby given of the institution of a trial.

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