

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INNOVATIVE GROWERS EQUIPMENT, INC.,
Petitioner,

v.

PIPP MOBILE STORAGE SYSTEMS, INC.,
Patent Owner.

IPR2022-00893
Patent 10,806,099 B2

Before BARRY L. GROSSMAN, JEREMY M. PLENZLER, and
CARL M. DEFRANCO, *Administrative Patent Judges*.

GROSSMAN, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

A. *Background and Summary*

Innovative Growers Equipment Inc. (“Petitioner” or “IGE”) filed a Petition (Paper 2) requesting an *inter partes* review of claims 1–11, 15, 18–42, 44–47, and 49–60 of U.S. Patent No. 10,806,099 B2 (Ex. 1001, “the ’099 patent”). On May 4, 2022, with our permission, Petitioner filed a Corrected Petition (Paper 4) correcting the identification of the challenged claims to include only claims 25, 26, 27, 45, 50, 58, and 59 (the “challenged claims”) of the ’099 patent.¹

Pipp Mobile Storage Systems, Inc. (“Patent Owner”) filed a Preliminary Response (Paper 8, “Prelim. Resp.”).

We concluded that Petitioner satisfied the burden, under 35 U.S.C. § 314(a), to show that there was a reasonable likelihood that Petitioner would prevail with respect to at least one of the challenged claims. Accordingly, on behalf of the Director (37 C.F.R. § 42.4(a)), and in accordance with *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1353 (2018), we instituted an *inter partes* review of all the challenged claims, on all asserted grounds. Paper 10 (“Decision to Institute” or “Dec. Inst.”).

With our permission (*see* Paper 22), Petitioner filed a Second Corrected Petition (Paper 16, cited as “Second Corrected Petition” or “2nd Corr. Pet.”), a new Exhibit 1025 (an English translation of the Japanese Fujio reference (the “Sullivan Translation”)), and a new Exhibit 1026 (a

¹ We noted, however, that the Corrected Petition continues to list on its cover page the same *incorrect* claim listing that was corrected in the text of the Corrected Petition. *See* Corrected Petition cover page listing claims “1–11, 15, 18–42, 44–47, 49–60” as the challenged claims. We considered this harmless error given that the challenged claims are stated correctly in the substantive sections of the Corrected Petition.

U.S. provisional application, which is the priority document for Ex. 1008, U.S. Patent No. 10,674,680, listing Shane Hutto as the sole inventor, asserted by Petitioner as a reference in this proceeding).

Patent Owner filed a Corrected Response. Paper 27 (“PO Response” or “PO Resp.”). Petitioner filed a Reply. Paper 29 (“Reply”). Patent Owner filed a Sur-reply. Paper 31 (“Sur-reply”).

Petitioner submitted fifty-one exhibits. *See* Exs. 1001–1051. Petitioner relies on the Declaration testimony of William Broz. *See* Ex. 1003.

Patent Owner submitted thirty-four exhibits. *See* Exs. 2001–2034. Patent Owner relies on the Declaration testimony of Brian Dumont. Ex. 2031.

A hearing was held July 27, 2023. *See* Paper 37 (“Transcript” or “Tr.”).

We have jurisdiction under 35 U.S.C. § 6. We enter this Final Written Decision pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73.

Petitioner has the burden of proving unpatentability of a claim by a preponderance of the evidence. 35 U.S.C. § 316(e).

Based on the findings and conclusions below, we determine that Petitioner has proven that all the challenged claims, which are claims 25–27, 45, 50, 58, and 59 are unpatentable.

B. Real Parties in Interest

Petitioner identifies Innovative Growers Equipment Inc. as the real party-in-interest. *See* 2nd Corr. Pet. 1.

Patent Owner identifies Pipp Mobile Storage Systems, Inc. as the real-party-in-interest. Paper 6, 2 (Mandatory Notices).

In its Preliminary Response, Patent Owner asserted that an *inter partes* review should not be instituted because Petitioner “appears to have failed to accurately identify all real parties in-interest.” Prelim. Resp. 21 (sub-heading “D”). We addressed this issue in our Decision to Institute. Dec. Inst. 9–13. Patent Owner did not raise this issue or argument in its PO Response. Thus, we consider this issue waived. *See* Dec. Inst. 39 (“Patent Owner is reminded that arguments from a Preliminary Response not made in a Response may be deemed waived.”; Paper 11 (Scheduling Order), 9 (“Patent Owner is cautioned that any arguments not raised in the response may be deemed waived.”)).

C. Related Matters

The parties identify as related litigation in federal district court, *Pipp Mobile Storage Systems, Inc. v. Innovative Growers Equipment, Inc.*, Case No. 1:21-cv-02104 (N.D. Ill). *See* Pet. 1; Paper 6, 2.

D. The '099 Patent

The '099 patent is titled “System and Method for Providing Carbon Dioxide and Circulating Air for a Vertical Gardening System.” Ex. 1001, code (54). The disclosed devices and methods relate “to circulating air and carbon dioxide² and providing light to a vertical gardening system.” *Id.*, 2:8–10. The Abstract states “[v]ertical growing uses a plurality of shelves to support plants.” *Id.*, code (57) (Abstract).

² We note that the Abstract states “purified and filtered air is mixed with nitrogen, which is directed towards plants.” Ex. 1001, code (57) (Abstract). This is the sole reference to nitrogen in the patent. The Title, Specification, and unchallenged claims refer exclusively to distributing air and carbon dioxide. *E.g., id.*, code (54) (title), 2:8–10 (“The present invention is directed towards a system and method for circulating air and carbon dioxide and providing light to a vertical gardening system;” claims 3, 5, 30.

As disclosed in the '099 patent, the practice of vertical farming produces food and medicine in vertically stacked layers and/or vertically inclined surfaces. *Id.*, 1:21–23. Warehouses and other structures which accommodate the growing of plants can be used for indoor vertical farming. *Id.*

The '099 patent states that “[t]he [disclosed] inventive system can be used with a vertical plant growing system to disperse carbon dioxide gas to a plurality of stacked shelves that are arranged vertically in a rack placed in a room or a building.” *Id.* at 3:47–50. As described in the '099 patent,

The present invention eliminates the problem of stagnant air pockets created in indoor vertical farming where space is limited. The present invention also disburses carbon dioxide directly onto each row of crops growing on a different shelf of a rack assembly. This process insures that each plant receives an equal quantity of carbon dioxide, as opposed to common methods of releasing carbon dioxide into a large general area with non-uniform distribution. The invention also provides a compact air filtration system, eliminating the need for large can filters commonly used.

Id., 2:10–22.

Figure 1 of the '099 patent is reproduced below:

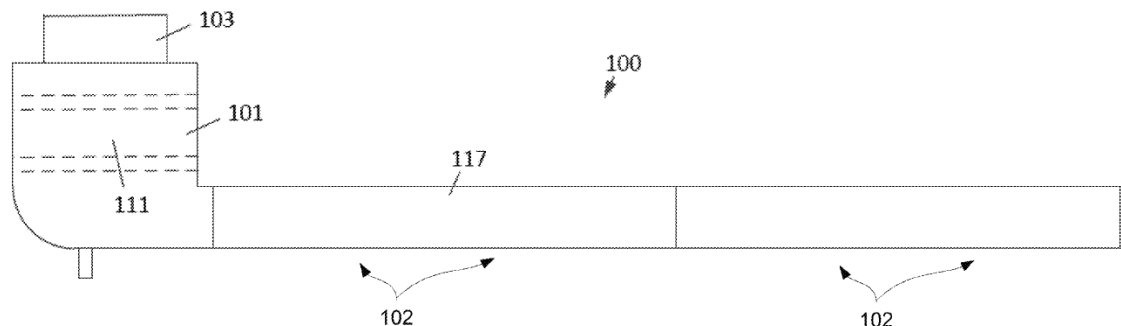


FIG. 1

Figure 1 is “a side view of an embodiment of the carbon dioxide distribution system.” *Id.*, 2:40–41.

Figure 2E of the ‘099 patent is reproduced below:

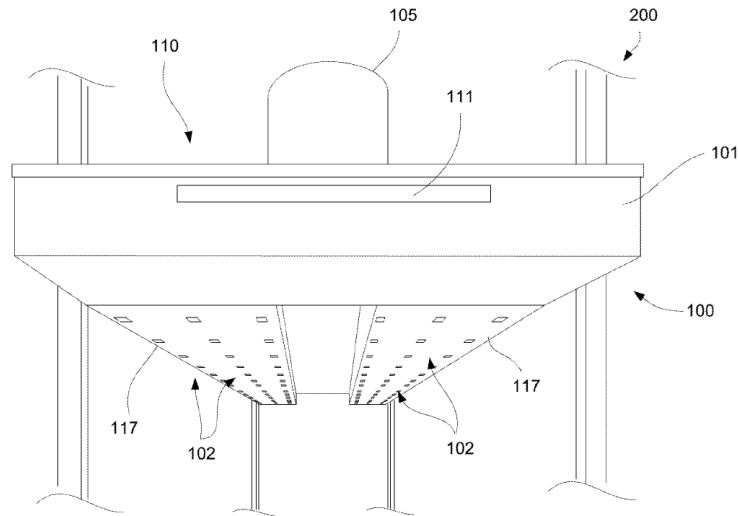


FIG. 2E

Figure 2E is “a perspective exploded assembly view of a distribution system when secured upon a rack system.” *Id.*, 2:48–49.

As shown generally in Figures 1 and 2E, carbon dioxide distribution system 100 includes intake collar 103, filter housing 101, fan 105, filters 111, carbon dioxide gas inlet 113, and elongated ducts 117 which have a plurality of openings 102. *Id.*, 3:63–4:6.

The ‘099 patent states:

The new invention differs from traditional methods by having the filters on the supply side of an air circulation system. This allows for the air coming out of the fan to be disrupted, eliminating the spiral motion and pressurizes the low profile duct evenly on either side. The inventive system creates air movement inside each rack of plants where wall fans can't reach and space does not allow for. The new invention allows carbon dioxide to be plumbed into the plenum and dispersed directly to the plants. The new invention utilizes fan or fans with a filter to clean the air as well as circulating the air. This allows for less space to be used,

lower energy costs, and the benefit of being able to change disposable filters more often at a much lower cost than ‘can filters’.

Id., 2:23–36.

The ’099 patent also discloses several other features such as “creat[ing] air movement inside each rack of plants where wall fans can’t reach and space does not allow for . . . carbon dioxide to be plumbed into the plenum and dispersed directly to the plants” and “utiliz[ing] fan or fans with a filter to clean the air as well as circulating the air.” *Id.*, 2:27–33. These benefits allow “for less space to be used, lower costs, and the benefit of being able to change disposable filters more often at a much lower cost than ‘can filters’.” *Id.*, 2:33–36.

Figure 2A in the ’099 patent is reproduced below.

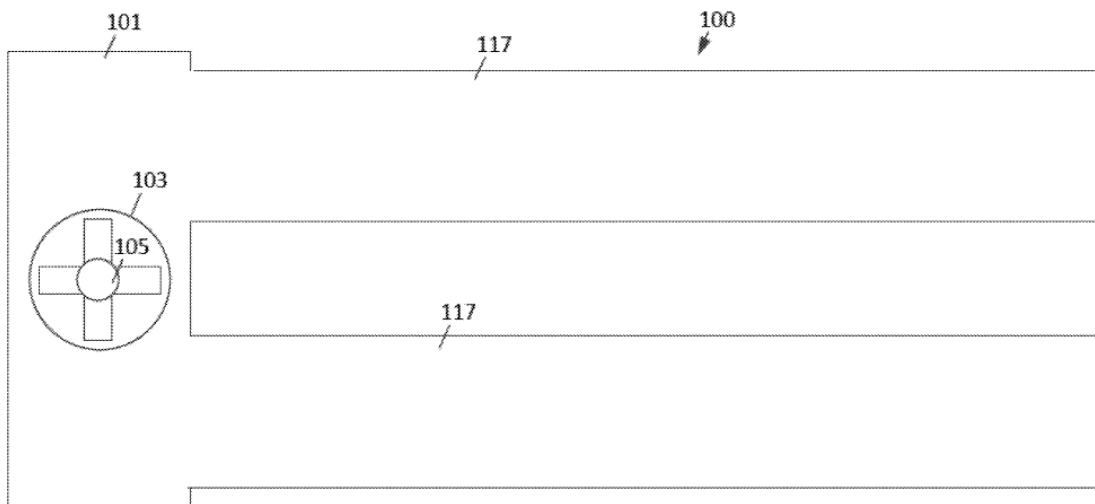


FIG. 2A

Figure 2A is a top view of an embodiment of the carbon dioxide distribution system of the disclosed invention. *Id.*, 2:42–43.

As shown in Figures 1, 2A, and 2E, air can be directed into intake collar 103 mounted on inlet portion of filter housing 101. *Id.*, 2:64–65. Fan 105 can be used to push the air into the intake collar 103. *Id.*, 2:65–66. The air enters filter housing 101 and flows through one or more filters 111. *Id.*, 3:67–4:1. The written description also states “[t]he filtered air can then flow into a plenum. A carbon dioxide gas inlet 113 can be coupled to the plenum and the carbon dioxide can be mixed with the filtered air.” *Id.*, 4:1–3. The “plenum” does not have a reference numeral assigned to it and we have not been directed to any persuasive evidence identifying its location or structure in the disclosed invention.³

Figure 2B from the '099 patent is reproduced below.

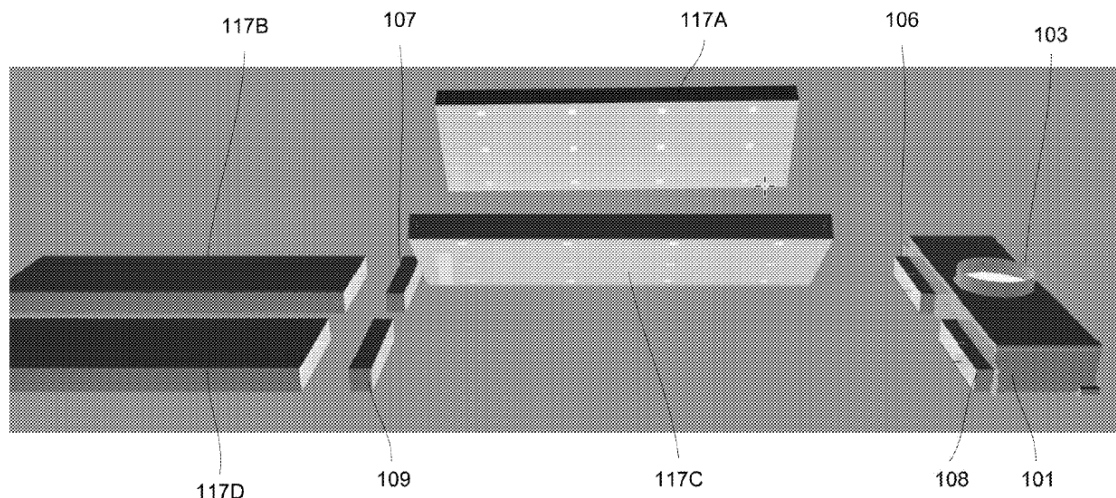


FIG. 2B

Figure 2B illustrates a perspective exploded assembly view of a system for distributing air and carbon dioxide as disclosed in the '099 patent. *Id.*, 2:44–45.

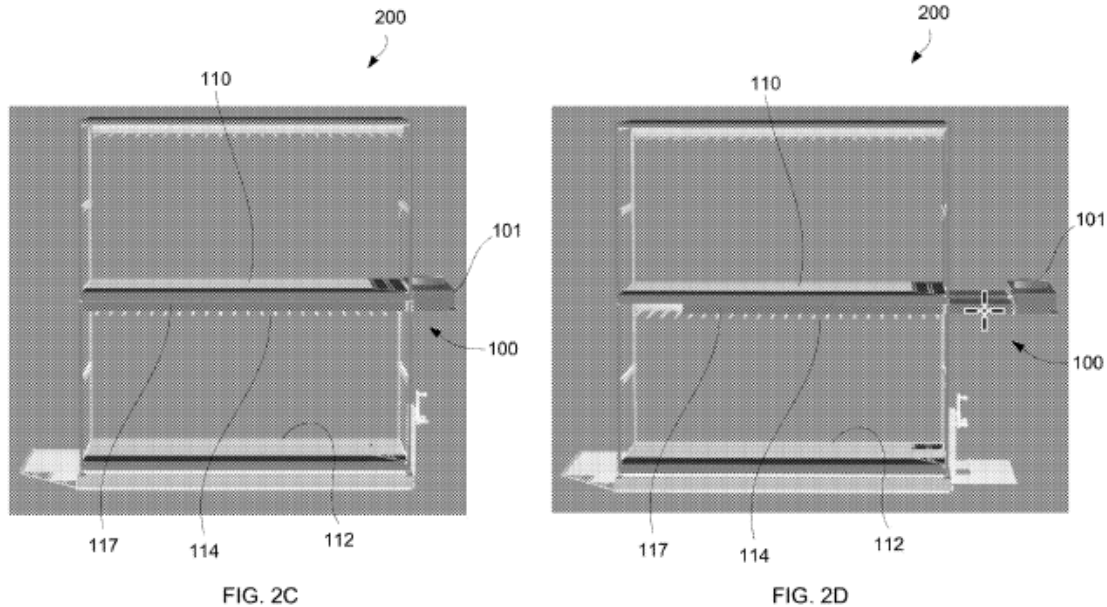
³ Gas inlet 113 does not appear in the drawings and is not mentioned again in the written description.

As shown in Figure 2B, each of ducts 117 may be formed from components 117A, 117B, 117C, and 117D, which are then “fluidly coupled” to filter housing 101. *Id.*, 4:45–51. Ducts 117 are then connected to “pallet rack system 200 having one or more shelves,” as shown in the perspective views of Figures 2C and 2D (reproduced below). *Id.*, 4:51–55. The illustrations show how assembled distribution system 100 may be attached below first shelf 110 so that air and/or carbon dioxide may be distributed from duct 117 onto any plants which may be placed upon second shelf 112 located below first shelf 110 and duct 117. *Id.*, 4:56–60. “With the distribution system secured upon the rack 200, the filter housing 101 may be positioned to extend from the rack 200^[4] to allow for positioning of the fan and access to the filter housing 101.” *Id.*, 4:60–64.

“An example of a pallet *rack 200* is the PiPP mobile storage systems rack shelving system that *has two basic components, beams and frames* which are assembled to build racks with stacked shelves 201.” *Id.*, 12:3–7 (emphases added). Here, shelves 201 are identified as separate and distinct from the “two basic components, beams and frames” that make up rack 200.

Figures 2C and 2D from the ’099 patent are reproduced below.

⁴ The ’099 patent refers to both “rack system 200” and “rack 200.” It appears that they are intended to refer to the same element.



Figures 2C and 2D illustrate perspective views of a distribution system integrated within a rack system. *Id.*, 2:46–47.

The '099 patent states that filtered air and carbon dioxide can be mixed and then flow into elongated ducts 117 (*see* Figures 2A and 2E) and through a plurality of holes 102 to the plants “which absorb the carbon dioxide.” *Id.* at 4:3–12. As further disclosed in the '099 patent,

Figure 2E shows a perspective end view of another embodiment in which the distribution system has been secured below a shelf 110 of the rack 200. As illustrated with the filter housing 101 and fan 105 extending from the rack 200, the two parallel ducts 117 may be seen extending from the filter housing 101 and along the length of the rack with the plurality of openings 102 aligned along the bottom surface of the ducts 117 for distributing air and/or carbon dioxide upon any plants positioned beneath.

Id. at 5:27–35.

During prosecution, Patent Owner authorized an examiner's amendment to amend application claims 39 and 58, which are issued claims 25 and 45, to include “air passing through the air inlet portion is received

into the housing in a *downward direction* and the air passing through the outlet portion is received into the elongated duct in a *horizontal direction*.” Ex. 1002, 0592–0593 (emphases added). We refer to this amendment as the “directional limitation,” as did Petitioner. *See* Tr. 17:1–5 (“in the reasons for allowance is the Patent examiner's words it was stated that in Ellestad -- the reason Ellestad doesn't render the claims obvious is because of this *directional limitation*. I'm going to use that shorthand rather than keep saying the air inlet so on and so forth”).

Following this amendment, the Examiner allowed the amended claims. Ex. 1002, 0588–0595. The Examiner stated that

The closest prior art reference to Ellestad et al. fails to show or render obvious wherein air passing through the air inlet portion is received into the housing in a downward direction and the air passing through the first and second outlet portions is received into the first and second elongated ducts in a horizontal direction, in combination with the structures recited in the flow distribution assembly of claim 1; wherein air passing through the air inlet portion is received into the housing in a downward direction and the air passing through the outlet portion is received into the elongated duct in a horizontal direction, in combination with the structures recited in the flow distribution assembly of claim 39 and the flow distribution system of claim 58.

Id. at 0594.

E. Illustrative Claim

Claims 25 and 45 are the independent claims challenged in the Petition. Claim 25, reproduced below with bracketed labels to facilitate analysis and discussion, is illustrative of the subject matter:

25[a]. A flow distribution assembly, comprising:

[b] a housing having an air inlet portion; and

[c] an elongated duct fluidly coupled to an outlet portion of the housing and having a plurality of openings defined on a

lower surface of the elongated duct, wherein the elongated duct extends from the housing and where the elongated duct is configured to be positioned upon and extend along a rack and where the housing is directly secured to the elongated duct, wherein *air passing through the air inlet portion is received into the housing in a downward direction and the air passing through the outlet portion is received into the elongated duct in a horizontal direction.*

Ex. 1001, 16:50–61 (with certain line breaks and bracketed labels employed to ease discussion) (emphasis added to show language added by Examiner’s amendment (*see* Ex. 1002, 591–594)).

Independent claim 45 is substantially similar to independent claim 25 but also includes “a rack having at least a first platform and a second platform positioned below the first platform” and “a fan fluidly coupled to the housing and extending away from the rack and where the housing is directly secured to the elongated duct.” *Id.* at 17:65–66, 18:13–15. Another distinction between the two independent claims is claim 25 states that the “elongated duct is configured to be positioned upon and extend along a rack and where the housing is directly secured to the elongated duct” (Ex. 1001, 16:54–58), whereas the elongated duct in claim 45 “is configured to be positioned below the first platform and extend through the rack such that the plurality of openings are directed towards the second platform underlying the first platform.” *Id.* at 18:4–8.

F. Prior Art and Asserted Grounds

Petitioner asserts that claims 25, 26, 27, 45, 50, 58, and 59 are unpatentable on the following four grounds (Pet. 8–9):

Claim(s) Challenged	35 U.S.C. § ⁵	Reference(s)/Basis
25–27, 45, 50, 58, and 59	103	Ellestad ⁶ , Hutto ⁷
25–27, 45, 50, 58, and 59	102	Takashima ⁸
25–27, 45, 50, 58, and 59	103	Takashima, Abe ⁹ , Fujio ¹⁰
25–27, 45, 50, 58, and 59	103	Fujio, Abe

Petitioner also relies on the Declaration testimony of William R. Broz. *See* Ex. 1003.¹¹

⁵ 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 has an effective filing date (April 2, 2012, based on a provisional application (*see* Ex. 1001, code (60))) before either of these dates, we refer to the pre-AIA version of the statute.

⁶ WO 2017/024079 A2, pub. Feb. 9, 2017 (Ex. 1006, “Ellestad”).

⁷ US Patent 10,674,680 B2, iss. Jun. 9, 2020 (Ex. 1008, “Hutto”).

⁸ US 2016/0007544 A1, pub. Jan. 14, 2016 (Ex. 1006, “Takashima”).

⁹ US 2019/0261587 A1, pub. Aug. 29, 2019 (Ex. 1011, “Abe”).

¹⁰ JP5696848, pub. Apr. 8, 2015 (Ex. 1010, “Fujio”). Exhibit 1010 is a 39 page document. The pages are not numbered in sequence as required by our rules. *See* 37 C.F.R. § 42.63(d)(2)(ii). Pages 1–14 are in the Japanese language. Pages 15 and 16 include drawing figures. Page 17 contains a mixture of Japanese characters and English numerals. Pages 18–39 are a machine-generated translation separately numbered in English as pages 1–22. Initially, Petitioner failed to submit the required affidavit attesting to the accuracy of the Fujio translation. *See id.* § 42.63(b). Subsequently, however, Petitioner complied by filing the translation with the required affidavit. *See* Ex. 1025.

¹¹ Mr. Broz is a Senior Managing Consultant at the Irvine, California office of Engineering Systems Inc. (“ESI”), a forensic scientific and engineering firm. Ex. 1003, 1. He is a licensed mechanical engineer in seven states and has more than 40 years of professional experience that includes extensive design and forensic work on HVAC systems in buildings. *Id.* Power and

II. ANALYSIS

A. Legal Standards of Patentability

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.”).

“To anticipate a claim, a prior art reference must disclose each and every element of the claim, either explicitly or inherently.” *Adasa Inc. v. Avery Dennison Corp.*, 55 F.4th 900, 910 (Fed. Cir. 2022) (citing *Eli Lilly & Co. v. Zenith Goldline Pharms., Inc.*, 471 F.3d 1369, 1375 (Fed. Cir. 2006)). “While those elements must be arranged or combined in the same way as in the claim, the reference need not disclose the elements in the very same terms used by the patent.” *Id.* (citing *In re Gleave*, 560 F.3d 1331, 1334 (Fed. Cir. 2009) (“[T]he reference need not satisfy an *ipsissimis verbis* test.” (citing *In re Bond*, 910 F.2d 831, 832–33 (Fed. Cir. 1990))). “The question of what a reference teaches and whether it describes every element of a

process piping design is a “particular specialty” of Mr. Broz, who served for more than 10 years on the Design Task Group of the ASME Power Piping Committee. *Id.*, Appendix A, 1. We note that Mr. Broz’s Declaration addresses different grounds and claims in addition to those asserted in the Petition. *See, e.g.*, Ex. 1003, ii–iv (Table of Contents referring to grounds and claims not asserted in the Petition). We do not consider these additional grounds and claims, as they are irrelevant to this proceeding. *See SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1357 (2018) (“[T]he petitioner’s contentions . . . define the scope of the litigation all the way from institution through to conclusion.”); *Rovi Guides, Inc. v. Vidal*, 2022 WL 1152311, at *2, fn 3 (Fed. Cir. Apr. 19, 2022) (considering only contentions asserted in the Petition; citing *SAS*).

claim is a question for the finder of fact.” *Id.* (citing *Med. Instrumentation & Diagnostics Corp. v. Elekta AB*, 344 F.3d 1205, 1221 (Fed. Cir. 2003)).

As further explained in *Net MoneyIN*,

unless a reference discloses within the four corners of the document not only all of the limitations claimed but also all of the limitations arranged or combined in the same way as recited in the claim, it cannot be said to prove prior invention of the thing claimed and, thus, cannot anticipate under 35 U.S.C. § 102.

Net MoneyIN, Inc. v. VeriSign, Inc., 545 F.3d 1359, 1371 (Fed. Cir. 2008). *Id.*; see also *Verdegaal Bros. v. Union Oil Co.*, 814 F.2d 628, 631 (Fed. Cir. 1987) (“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.”). “The identical invention must be shown in as complete detail as is contained in the . . . claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236 (Fed. Cir. 1989).

Section 103(a) 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 (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.¹² *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. Moreover, “it is error to reach a conclusion of obviousness until all th[e *Graham*] factors are considered.” *Cyntec Co., Ltd. v. Chilisin Elecs. Corp.*, No. 2022-1873, 2023 WL 6798376, at *3 (Fed. Cir. Oct. 16, 2023) (quoting *Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1048 (Fed. Cir. 2016) (en banc)).

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.*; *see also Orexo AB v. Actavis Elizabeth LLC*, 903 F.3d 1265, 1273 (Fed. Cir. 2018)

¹² Patent Owner does not direct us to any objective evidence of non-obviousness in its Preliminary Response.

(“The question is not whether the various references separately taught components of the ’330 Patent formulation, but whether the prior art suggested the selection and combination achieved by the ’330 inventors.”).

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. The 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 of the parties.

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. Ltd, Inc. 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.

Additionally, the Supreme Court informs us that “[a] person of ordinary skill is also a person of ordinary creativity, not an automaton.” *KSR*, 550 U.S. at 421.

With regard to the level of ordinary skill in the art, Petitioner asserts

a person of ordinary skill in the art at the time of the ’099 patent would have been a person having at least an undergraduate Bachelor’s degree in mechanical engineering, a Bachelor of Science in engineering from an Accreditation Board for Engineering and Technology (ABET) - accredited institution of higher learning in the United States, or equivalent.

2nd Corr. Pet. 6.

Petitioner also argues that a person of ordinary skill would have at least four years of experience in “the design of air flow distribution systems.” *Id.*

In its Preliminary Response, Patent Owner argued that Petitioner failed to provide a correct definition of a person of ordinary skill. *See* Prelim. Resp. 22–23. Patent Owner did not provide its own proposed level of skill. In its PO Response, Patent Owner failed to present any argument concerning this issue. Accordingly, we consider this issue waived by Patent Owner. *See* Dec. Inst. 39 (“Patent Owner is reminded that arguments from a Preliminary Response not made in a Response may be deemed waived.”); Paper 11 (Scheduling Order), 9 (“Patent Owner is cautioned that any arguments not raised in the response may be deemed waived.”).

At the hearing, in response to a question from the Board about the level of skill, counsel for Petitioner stated “[i]t is a very simple invention.” Tr. 14:11. Additionally, counsel for Petitioner stated:

A degreed engineer, I don't know if it's a distinction that makes any difference in this case. I think it is a pretty low level of skill, a person of ordinary skill in the art. So I would say that . . . the person of ordinary skill does not necessarily need to have to be degreed if they have the work experience that would give them that type of knowledge.

Id., 14:16–21. This is essentially the standard adopted in our Decision to Institute (Dec. Inst. 19), which we maintain in this Decision.

Based primarily on the prior art and the technology as described in the '099 patent, we determine that the level of ordinary skill is a degreed engineer in a relevant technology or in a similar relevant engineering or science discipline with one year of relevant experience, or an equivalent balance of relevant education and work experience. Thus, adequate experience may compensate fully for lack of a formal degree in engineering or other relevant discipline.

C. Claim Construction

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) (2019). Under this standard, 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 asserts that “[u]nless otherwise noted below, Petitioner has applied the plain and ordinary meaning to the limitations of the Challenged Claims.” 2nd Corr. Pet. 9.

Patent Owner asserts specific constructions for the claim terms “rack” (PO Resp. 5–8) and “housing” (*id.* at 8–11).

“[W]e need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy.’” *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Ltd.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)). Here, we determine the claim terms that need specific construction are the two terms proposed by Patent Owner for specific construction. Accordingly, we construe these terms below.

1. General Claim Construction Principles

“It is a ‘bedrock principle’ of patent law that ‘the claims of a patent define the invention to which the patentee is entitled the right to exclude.’” *Phillips*, 415 F.3d at 1312 (citations omitted). “[T]here is no magic formula or catechism for conducting claim construction.” *Intel Corp. v. Qualcomm Inc.*, 21 F.4th 801, 809 (Fed. Cir. 2021) (quoting *Phillips*, 415 F.3d at 1324). Fortunately, however, there is substantial judicial guidance.

Claim construction requires determining how a skilled artisan would understand a claim term “in the context of the entire patent, including the specification.” *Grace Instrument Indus., LLC v. Chandler Instruments Co., LLC*, 57 F.4th 1001, 1008 (Fed. Cir. 2023) (quoting *Phillips*, 415 F.3d at 1313. *Id.* (citation omitted). “[C]laims must be read in view of the specification, of which they are a part.” *Id.* (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 978 (Fed. Cir. 1995) (en banc)). The Specification, or more precisely, the written description, is the “single best guide to the meaning of a disputed term.” *Id.* (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996), and “is, thus, the primary basis for construing the claims.” *Id.* (citation omitted). Although

claim terms are interpreted in the context of the entire patent, it is improper to import limitations from the Specification into the claims. *Phillips*, 415 F.3d at 1323. Thus, we are careful not to cross that “fine line” that exists between properly construing a claim in light of the specification and improperly importing into the claim a limitation from the specification.” *Comark Commc ’ns., Inc. v. Harris Corp.*, 156 F.3d 1182, 1186 (Fed. Cir. 1998) (“We recognize that there is sometimes a fine line between reading a claim in light of the specification, and reading a limitation into the claim from the specification.”).

While certain terms may be at the center of the claim construction debate, the context of the surrounding words of the claim also must be considered in determining the ordinary and customary meaning of those terms. *ACTV, Inc. v. Walt Disney Co.*, 346 F.3d 1082, 1088 (Fed. Cir. 2003). We may also consider the patent’s prosecution history. *Phillips*, 415 F.3d at 1317. In addition, we may also look to available “extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art.” *Phillips*, 415 F.3d at 1314 (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1116 (Fed. Cir. 2004)).

2. “Rack”

Patent Owner asserts “[t]he term ‘rack’ in the context of the challenged claims is to be construed as ‘a stand with upright supports and at least one shelf.’” PO Resp. 5. The asserted basis for Patent Owner’s proposed construction is that “[t]his is the construction of the claim term ‘rack’ determined by the District Court in the parallel litigation. *Id.* (citing Ex. 2027, 19–21). Exhibit 2027 is the District Court’s claim construction Opinion and Order. In the District Court, however, Patent Owner argued for

a different construction. It was Patent Owner's position in the District Court that the term "rack" should be construed as "a stand with upright supports and two or more vertically stacked growing regions." Ex. 2027, 19. The District Court stated that "Pipp's [Patent Owner's] proposed terminology of 'two or more vertically stacked growing regions' is confusing and does not accurately reflect the invention." *Id.*, 20. As further stated by the District Court, based on "Innovative's" [Petitioner in the proceeding before us] argument,

the specification discusses racks having shelves, not "vertically stacked growing regions," and so the Court finds it appropriate to construe the term in reference to such shelves. Further, the specification and embodiments indicate that a rack may have a varying number of shelves, but must always include at least one shelf.

Id. Accordingly, the Court construed "rack" to mean "a stand with upright supports and at least one shelf." *Id.* As required by our rules (37 C.F.R. § 42.100(b)), any prior claim construction determination concerning a term of the claim in a civil action, or a proceeding before the International Trade Commission, that is timely made of record in the *inter partes* review proceeding will be considered. We have fully considered the District Court's claim construction in Exhibit 2027 and give it substantial probative weight. We are not, however, bound by a previous district court interpretation of a disputed claim term. *Knowles Elecs. LLC v. Iancu*, 886 F.3d 1369, 1376 (Fed. Cir. 2018). We consider claim construction based on the arguments of the parties in this IPR proceeding, which are different than the arguments in the District Court, the evidence before us, and our own analysis of the record in this proceeding.

In this IPR proceeding, the parties appear to have reversed their District Court positions. After arguing in the District Court that the “rack” includes one or more shelves, Petitioner now asserts that the term “‘rack,’ by itself, does *not* include shelves.” Reply 3 (emphasis in original). After arguing in the District Court that the “rack” includes “two or more growing regions” (Ex. 2027, 20), Patent Owner now asserts the rack includes at least one shelf.” Reply 5.

Petitioner asserted to the District Court that “IGE [Petitioner in this IPR proceeding] agrees with Pipp [Patent Owner] that the plain and ordinary meaning of rack in the art includes at least one shelf.” Ex. 2006, 15. Petitioner asserts in the proceeding before us, however, that its assertion to the District Court that a “rack” includes at least one shelf “was a ‘misstatement.’” Tr. 10, 4–22.

Dr. Broz, Petitioner’s expert, testified that the term “rack” would be understood to mean a structure that has shelves. Ex. 2005, 15–18 (Q. “So, in your opinion, in Claim 25, the term ‘rack’ would be understood to mean a structure that has shelves; is that accurate?” A. “In the context of the ‘099 patent, yes.”).

Mr. Dumont, Patent Owner’s expert, testified that, in his opinion, “in the context of the ‘099 patent and the challenged claims, the term ‘rack’ would be understood by a POSITA to mean a structure that includes at least one shelf.” Ex. 2031 ¶ 39.

Against this background, and guided by *Phillips* and other judicial guidance discussed above, we look first to the intrinsic record to determine the construction of “rack.” We begin our claim construction analysis with the language used in the claims.

a) *Claims*

The term “rack” appears in challenged claims 25, 26, 45, and 50.

Independent claim 25 is directed to a “flow distribution assembly” that includes an “elongated duct” that “is configured to be positioned upon and extend along a rack.” Ex. 1001, 16:49–56. Claim 25 does not provide any specific structure for the claimed rack. Claim 25 does not mention a shelf or shelves included as part of the rack.

Claim 26, dependent on claim 25, includes a “second elongated duct” with both elongated ducts “positionable upon a rack.” *Id.*, 16:62–17:2. Claim 26 does not provide any specific structure for the claimed rack. Claim 26 does not mention a shelf or shelves included as part of the rack.

Independent claim 45 is directed to a “flow distribution system” that includes “a rack having at least a *first platform* and a *second platform* positioned below the first platform.” *Id.*, 17:64–66 (emphases added). Claim 45 also includes “an elongated duct” and states that the “elongated duct is configured to be positioned below the first platform and extend through the rack such that the plurality of openings [in the elongated duct] are directed towards the second platform underlying the first platform.” *Id.*, 18:1–8. Claim 45 does not provide any additional structure or function for the “rack” or the first and second “platforms.”

We will discuss the Specification in the next section of this Decision. We note here, however, the claimed structural relationship in claim 45 of the claimed rack, the claimed elongated duct, and the claimed first and second platforms is shown in Figures 2C and 2D. These illustrations show how assembled distribution system 100 may be attached “below first shelf 110 so that air and/or carbon dioxide may be distributed from duct 117 onto any

plants which may be placed upon second shelf 112 located below first shelf 110 and duct 117.” Ex. 1001, 4:56–60.

Challenged claim 45 is the only claim among the sixty claims in the patent that uses the word “platform” in a way that is synonymous with the word “shelf.” Several non-challenged claims include a “diverter platform.” *E.g., see id.*, 16:20 (claim 16 referring to a “diverter platform”). As we discuss in the next section of this Decision, the Specification makes clear that a “diverter platform” bears no relation in structure or function to a shelf.

Claim 50, dependent on claim 45, includes two elongated ducts, with both elongated ducts “positionable upon the rack.” *Id.*, 18:35–42. Claim 50 does not provide any additional structure or function for the “rack” or the first and second “platforms.”

The word “shelf” or “shelves” does *not* appear in any of the sixty challenged or unchallenged claims.

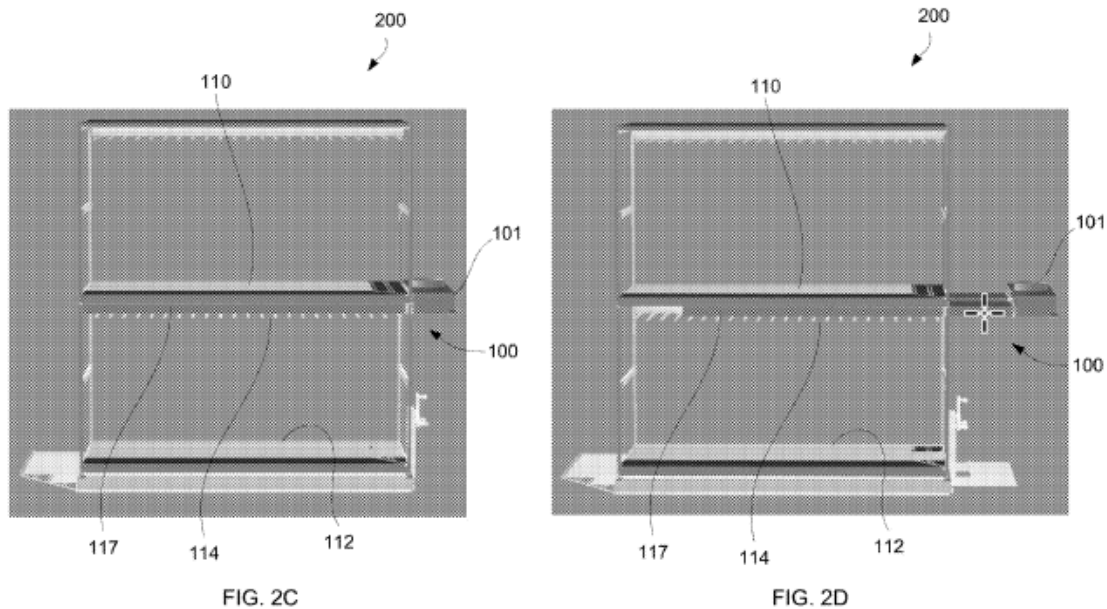
b) Specification

Claims “must be read in view of the specification, of which they are a part.” *Phillips*, 415 F.3d at 1315 (citation omitted). “The specification ‘is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.’” *Id.* (citation omitted). Thus, we turn to the Specification for additional guidance on the meaning of the claim term “accessibility attribute.”

The Specification, or more precisely, the written description of the ’099 patent, uses the word “shelf” twenty-one times, based on a “find” word search of the patent for the word “shelf.” The written description of the ’099 patent uses the word “shelves” twenty-seven times, again based on a “find” word search for the word “shelves.” The fact that words that are prominent in the written description, but absent from any of the sixty claims in the

patent, suggests that the inventor intended *not* to claim a shelf or shelves in the claimed invention.

Moreover, as stated above, claim 45 includes first and second “platforms” with the claimed elongated duct “configured to be positioned below the first platform and extend through the rack such that the plurality of openings are directed towards the second platform underlying the first platform.” This structure is shown in Figures 2C and 2D, which are reproduced again for convenient reference.



As shown in Figures 2C and 2D, the Specification states ducts 117 are “fluidly coupled to the filter housing 101.” Ex. 1001, 4:50–51. Ducts 117 are then “slid or urged into place within, e.g., a pallet rack system 200 having one or more shelves [110, 112] . . . as shown in the perspective views of FIGS. 2C and 2D.” *Id.*, 4:52–55. The Specification also states that Figures 2C and 2D “show how one assembled distribution system 100 may be attached below a first shelf 110 so that the air and/or carbon dioxide may be distributed from the duct 117 and onto any plants which may be placed upon a second shelf 112 located below the first shelf 110 and duct 117.”

Ex. 1001, 4:56–60. As shown in the chart below, this description from the Specification aligns with the structure claimed in claim 45, which substitutes the word “platform” for the word “shelf” used in the Specification.

Claim 45	Specification
“a rack having at least a first platform and a second platform positioned below the first platform;” Ex. 1001, 17:65–67. “the elongated duct is configured to be positioned below the first platform and extend through the rack such that the plurality of openings are directed towards the second platform underlying the first platform,” <i>id.</i> , 18: 4–8.	distribution system 100 may be attached below a first shelf 110 so that the air and/or carbon dioxide may be distributed from the duct 117 and onto any plants which may be placed upon a second shelf 112 located below the first shelf 110 and duct 117.” <i>Id.</i> , 4:56–60.

The identity of function and structure between claim 45 and the Specification indicate that the first and second platforms in claim 45 correspond to the first and second shelves 110 and 112 as described in the Specification. Thus, the word “rack,” as used in claim 45, cannot inherently include one or more shelves as proposed by Patent Owner because then the “platforms” in claim 45 would be redundant of the shelves already included in the claimed “rack.”

The identity of structure between the word “platform” as used in claim 45 and “shelf” is confirmed by the reference in the Specification to the “shelf platforms” in referring to shelves 301, 302 in the embodiment shown in Figure 16 and described in the related written description. Ex. 1001, 14:23–26.

The word “platform” also is used in the Specification in the context of a “diverter platform” recited in some unchallenged claims. *See, e.g.*, Ex. 1001, 16:20 (claim 16). The Specification describes that flow diverters 260 may be attached to or positioned into proximity to the air openings in duct 117, such as being secured to the distal edge of the opening relative to the direction of airflow through the duct 117. *Id.*, 13:1–9. Flow diverter 260 may have a “diverter platform” 261 (*see* Figure 12B) which defines a flow surface 262. *Id.*, 13:13–29. A “diverter platform” is *not* recited in claim 45.

We also recognize that in all of the disclosed embodiments the Specification states “the racks *may incorporate* a single shelf, two shelves, or multiple shelves (e.g., up to six shelves or more than six shelves) depending upon the desired number of shelves.” *Id.*, 14:18–22 (emphasis added). This statement does not establish that the rack itself inherently includes one or more shelves. It states only that the rack “*may incorporate*” one or more shelves. Thus, the rack also may *not* incorporate one or more shelves,

c) Prosecution History

The parties have not directed us to any persuasive evidence from the proceedings leading to issuance of the ’208 patent to inform our construction of the term “rack.”

d) Extrinsic Evidence

We have discussed the expert testimony above. The parties do not otherwise direct us to any persuasive extrinsic evidence concerning the meaning of the term “rack.”

(e) Claim Construction Conclusion for “Rack”

We recognize that “[t]he very nature of words would make a clear and unambiguous claim a rare occurrence.” *Autogiro Co. of Am. v. United*

States, 384 F.2d 391, 396 (Ct. Cl. 1967). The Federal Circuit, however, has provided a beacon, which we have followed, to guide us in determining the proper construction when we encounter ambiguities or differing interpretations from the parties:

Ultimately, the interpretation to be given a term can only be determined and confirmed with a full understanding of what the inventors actually invented and intended to envelop with the claim. The construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention will be, in the end, the correct construction.

Renishaw PLC v. Marposs Societa’ per Azioni, 158 F.3d 1243, 1250 (Fed. Cir. 1998) (citations omitted).

Based on the evidence and the analysis above, and consistent in part with the District Court construction, we determine that the term “rack” means “a stand with upright supports.” This is the construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention.

We also note here, however, that as discussed in the substantive asserted grounds, the outcome of our substantive analysis would be the same if we were to adopt the District Court’s construction of “rack.”

3. “Housing”

Patent Owner asserts that the construction of the term “housing” is “an air enclosure within an air flow system, as a separate element from a fan, to provide a plenum function.” PO Resp. 8–9.

Petitioner asserts that “[n]o functional requirement for the housing is claimed. Moreover, Pipp could have claimed, but did not, a plenum—as it did in its related patent applications that recite ‘a housing . . . defining a

plenum . . .” Reply 4 (citing Ex. 1043; Ex. 1044). We first address this specific argument before turning to the intrinsic evidence.

Exhibit 1043 is an excerpt of claims from related patent application Serial No. 16/892,595, now U.S. Patent No. 11,641,810 (the “’810 patent,” which is Ex. 3005) (*compare* Ex. 1001 code (63) and Ex. 3005 code (63)).

Exhibit 1044 is an excerpt from related patent application 17/012,322, now U.S. Patent No. 11,632,915 (the “’915 patent,” which is Ex. 3006) (*see* Ex. 3006 code (63) stating that the ’915 patent is a continuation of the application that is now the challenged ’099 patent in this IPR proceeding).

In the ’810 patent (Ex. 3005), independent claims 1, 10, and 21 include a housing defining a plenum between the air inlet and outlet portions. *See, e.g.*, Ex. 3005, 7:23–25. Independent claims 25 and 29, however, include only a housing, with no reference to a plenum. *See, e.g., id.* 9:47.

In the ’915 patent (Ex. 3006), independent claims 1 and 32 include a housing defining a plenum between the air inlet and outlet portions. *See, e.g.*, Ex. 3006, 15:20–23. Independent claims 11, 20, 22, and 27, however, include only a housing, with no reference to a plenum. *See, e.g., id.* at 16:15.

Where multiple patents “derive from the same parent application and share many common terms, we must interpret the claims consistently across all asserted patents.” *SightSound Techs., LLC v. Apple Inc.*, 809 F.3d 1307, 1316 (Fed. Cir. 2015) (quoting *NTP, Inc. v. Research In Motion, Ltd.*, 418 F.3d 1282, 1293 (Fed. Cir. 2005)).

Here, we determine that the ’810 and ’915 patents, related directly to the ’099 patent now before us, provide persuasive evidence that a “housing”

as disclosed and claimed in the '099 patent, does *not* inherently include or define a plenum.

a) Claims

Independent claims 25 and 45 each include “a housing having an air inlet portion.” *E.g., see* Ex. 1001, 16:50 (claim 25); 17:67 (claim 45). The housing also is fluidly coupled with various other components, such as an elongated duct. *E.g., see id.* at 16:51–61 (claim 25). Concerning the issue raised by the parties, which is whether the housing provides “a plenum function.” We note that the word “plenum” does not appear in any of the sixty claims in the '099 patent. There is no “plenum function” claimed.

b) Specification

The Specification refers extensively to “filter housing 101” and it also refers to “filter housing 250.” *E.g., see* Ex. 1001, 3:65; 10:29–30.

Addressing the issue presented by the parties, the word “plenum” appears five times in the Specification. It does not have a reference numeral associated with it and is not specifically identified in any of the patent figures.

In the Summary of the Invention, the Specification states “[t]he new invention allows carbon dioxide to be plumbed into the plenum and dispersed directly to the plants.” Ex. 1001, 2:29–31.

In the Detailed Description, the Specification states “[t]he air can enter the filter housing 101 and flow through one or more filters 111. The filtered air can then flow into a plenum. A carbon dioxide gas inlet 113 can be coupled to the plenum and the carbon dioxide can be mixed with the filtered air.” *Id.*, 3:66–4:3. The reference numeral 113 for the gas inlet is not shown in any of the patent figures, and thus does not provide us with the location, structure, or function of the plenum.

The Specification also states “[w]hen the air enters the plenum through the fan 105, the air must passes [sic] through the air filters 111.” *Id.*, 6:47–48. Here, the word “plenum” is used as a synonym for “housing,” because air from fan 105 enters filter housing 101. As stated in the Specification, “a fan 105 can be used to push the air into the intake collar 103. The air can enter the filter housing 101 and flow through one or more filters 111. The filtered air can then flow into a plenum.” Ex. 1001, 3:65–4:1. A plenum, however, is neither shown nor described.

Additionally, the Specification states, in the context of Figure 10, that “the filter housing 250 can include a pre-filter 251, disinfectant lights 255 and a secondary filter 253.” *Id.*, 10:29–31. After stating that lights 255 are included in filter housing 250, the Specification then states “[t]he [disinfectant] lights are mounted in the plenum that eliminates surface bacteria, mold, and viruses from the system.” *Id.*, 10:64–65.

Figure 10 is reproduced below.

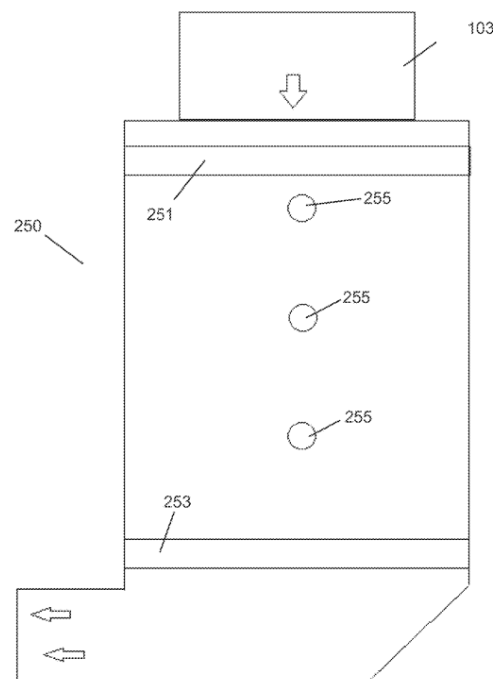


FIG. 10

As shown in Figure 10, lights 255 are positioned within housing 250. A plenum is not identified.

c) Prosecution History

The parties have not directed us to any persuasive evidence from the proceedings leading to issuance of the '099 patent to inform our construction of the term “housing.”

d) Extrinsic Evidence

The parties do not direct us to any persuasive extrinsic evidence concerning the meaning of the term “housing.” We note that the “plenum” issue was not considered by the District Court in its claim construction Order. *See* Ex. 2027, 6–8. The issue considered by the District Court was whether the housing required a filter. *Id.* The District Court concluded that the term “a housing having an air inlet portion” is given “its plain and ordinary meaning.” *Id.*, 8.

e) Claim Construction Conclusion for “Housing”

Based on the evidence and the analysis above, and consistent with the District Court construction, we determine that that the term “housing” has its plain and ordinary meaning, which is an enclosure. This is the construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention.

We now address the asserted grounds of unpatentability.

D. Ground 1

Whether Claims 25–27, 45, 50, 58 and 59 Would Have Been Obvious Based on Ellestad and Hutto

Petitioner asserts claims 25–27, 45, 50, 58 and 59 are unpatentable under § 103(a) as obvious in view of Ellestad and Hutto. 2nd Corr. Pet. 10–15. First, we summarize these two references.

1. Ellestad (Ex. 1006)

Ellestad is titled “Horticultural Lighting Systems, Sensor Modules, and Control Systems” and relates to “horticultural lighting systems.” Ex. 1006, code (54), ¶ 9.

In stating the reasons for allowance, the Examiner characterized Ellestad as the “closest prior art reference,” but found that Ellestad “fails to show or render obvious” the claim limitation that “air passing through the air inlet portion is received into the housing in a downward direction and the air passing through the first and second outlet portions is received into the first and second elongated ducts in a horizontal direction, in combination with the structures recited in the flow distribution assembly of [application] claim 1.” Ex. 1002, 594.

Ellestad describes that there are several challenges to the global food system “from environmental risks, especially drought, and inefficient and wasteful supply-chains that result in significant price and supply volatility of perishable crops.” *Id.* ¶ 2. To facilitate a demand for responsibly sourced healthy foods by a growing population, the environment has been impacted by the strain on fresh water, electricity, and labor. *See id.* The environment is further impacted by the use of the large amounts of chemicals. *See id.* The result of this demand “is an incredible burden on the environment and millions of Americans who lack access to fresh, healthy, and affordable produce.” *Id.* Ellestad further describes the problems of various then-existing agricultural systems including conventional agriculture, organic agriculture, urban agriculture, and greenhouse growing. *See id.* ¶¶ 3–6.

Ellestad describes “horticultural lighting systems, sensor modules, and control systems ... to improve growing conditions for crops and plants in controlled environmental agriculture systems.” *Id.* ¶ 8. Ellestad further

describes a controlled environmental agriculture system being a modular indoor farm and indicates the benefits of these modular indoor farms “is the ability to produce at a significantly higher density as a result of more sophisticated monitoring and control, better water treatment practices, and the integrated air flow management lighting system.” *Id.* ¶ 76. An increase in crop production density is “enable[d] by each level being separated by less than 11” which “may result in a more economically viable system of indoor crop production and may be a meaningful new step in indoor crop production.” *Id.* ¶ 76.

Ellestad describes indoor farming modules containing mechanical racking systems which may be coupled or uncoupled to an indoor farming module, be freestanding, and may contain horizontal racks/levels. *Id.* ¶ 64. An integrated air flow management system and an irrigation system may be contained on each level of the indoor farming module. *Id.* ¶ 65–66. The integrated air flow management system includes a lighting apparatus, an air flow generator for generating air flow, and an air duct with variable area vents “that allow air to flow through to the crop canopy at variable rates and volumes.” *Id.* ¶ 65.

Figure 5 of Ellestad is reproduced below:

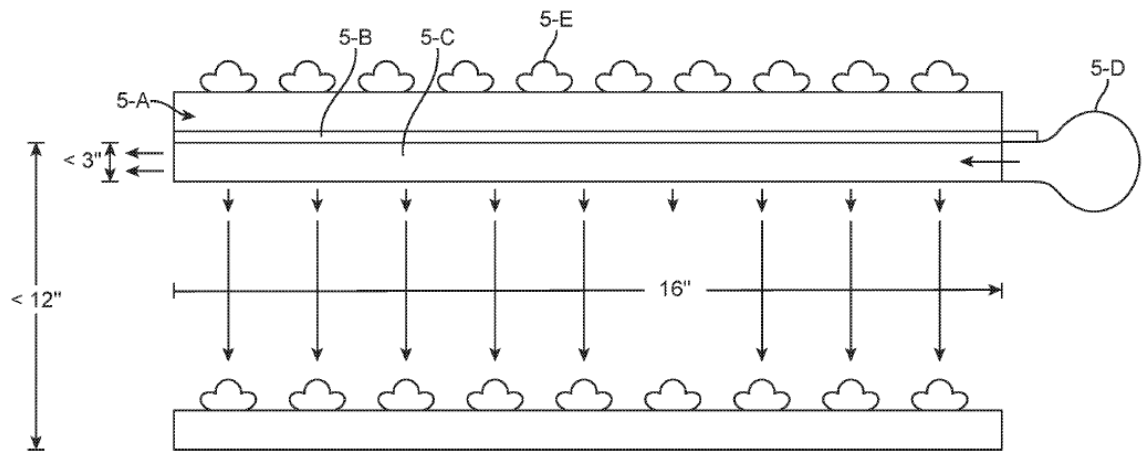


FIG. 5

Figure 5 is an illustration of “an integrated airflow management lighting system.” Ex. 1006 ¶ 29.

As shown in Figure 5, the integrated airflow management lighting system includes “irrigation plumbing (‘5-A’), a lighting system (‘5-B’), transparent and/or reflective duct (‘5-C’), an airflow generator (‘5-D’), and crops (‘5-E’).” *Id.* ¶ 73. There may be variable air vents included in the transparent and/or reflective duct and the integrated. *Id.* The integrated airflow management system can be used to “ensure there is adequate air circulation throughout the plant canopy while enabling ultra-high density crop production.” *Id.*

Figure 6 of Ellestad is reproduced below:

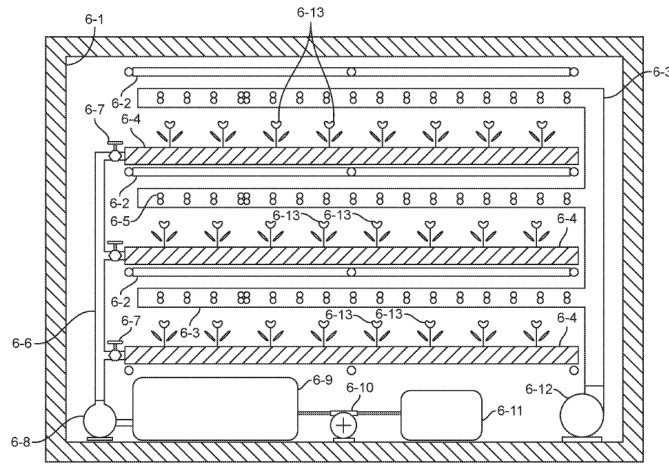


FIG. 6

Figure 6 is an illustration of “a front, internal view of a modular indoor farm.” Ex. 1006 ¶ 30.

As shown in Figure 6, a modular indoor farm includes “an insulated enclosure (‘6-1’), low-profile lights (‘6-2’), air-distribution plumbing (‘6-3’), planting trays (‘6-4’), air distribution orifices (‘6-5’), water distribution plumbing (‘6-6’), fill/drain valve (‘6-7’), water pump (‘6-8’), water storage tank (‘6-9’), additive metering pump (‘6-10’), additive storage tank (‘6-11’), air blower (‘6-12’), and plants (‘6-13’).” *Id.* ¶ 74.

Figure 11 of Ellestad is reproduced below:

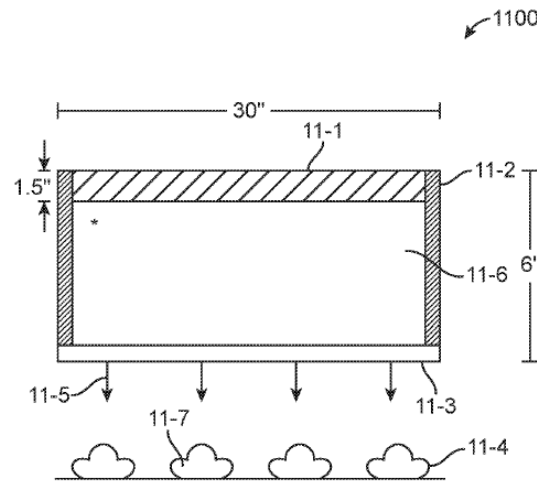


Figure 11 is an illustration of “an end view of a lighting system having a first airflow systems.” Ex. 1006 ¶ 35.

As shown in Figure 11, “a duct cavity (11-6) is formed in the lighting system 1100 through the light fixture (11-1), aluminum (11-2), and a bottom cover (11-3).” *Id.* ¶ 84. Bottom cover (11-3) can include air holes which can “direct vertical airflow (11-5) to the plants.” *Id.*

2. *Hutto (Ex. 1008)*

The patent application that matured into the Hutto patent was filed on July 27, 2018. Ex. 1008, code (22). Hutto claims priority to a provisional application filed on August 4, 2017. *Id.*, code (60).

Hutto discloses a fan coil apparatus for a closed greenhouse that recirculates air within a greenhouse. Ex. 1008, Abstract. The disclosed apparatus includes “a housing with an intake and an outtake” and further includes a filter that filters recirculating air that enters the intake. *Id.* The disclosed apparatus also includes a fan that directs the recirculating air through the outtake outside the housing. *Id.*

Figures 1A and 1B from the Hutto patent (Ex. 1008) are reproduced below.

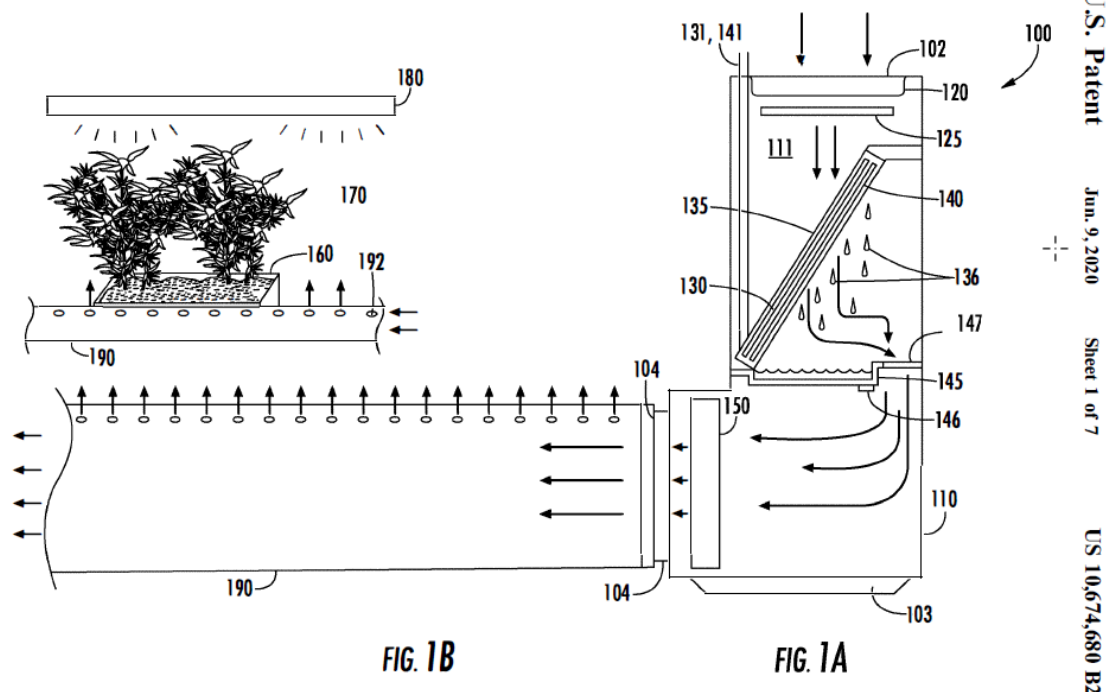


Figure 1A from the Hutto patent shows a cross sectional schematic view inside the fan coil apparatus and ducting for a greenhouse airflow system. Ex. 1008, 2:7–8; 2:23–25. Figure 1B from the Hutto patent shows a partial overview of the ducting inside a greenhouse setting. *Id.*, 2:9–10.

As shown in Figure 1A, Hutto’s fan coil apparatus 100 may include housing 110, filter 120, and fan 150. *Id.*, 2:35–51. Hutto also discloses that “air enters the fan coil apparatus 100 through an intake 102.” *Id.*, 2:51–54. After passing through intake 102, the air passes through filter 120. *Id.*, 2:63–65. The air “then passes through the fan 150, which has been drawing its flow since it entered the intake 102 and pushes it through the outlet 104 and into the duct tubing 190.” *Id.*, 4:38–40. Duct tubing 190 “may run beneath a plant 170 canopy, such that the recirculating air is directed upwards through holes 192 to the plants 170.” *Id.*, 4:49–51.

Hutto also discloses that “[a]lthough the intake can be connected to purely ambient air and the fan coil apparatus would be effective, the fan coil apparatus 100 is designed for a fully-closed greenhouse.” Ex. 1008, 2:54–57.

Figure 2B from Hutto is reproduced below.

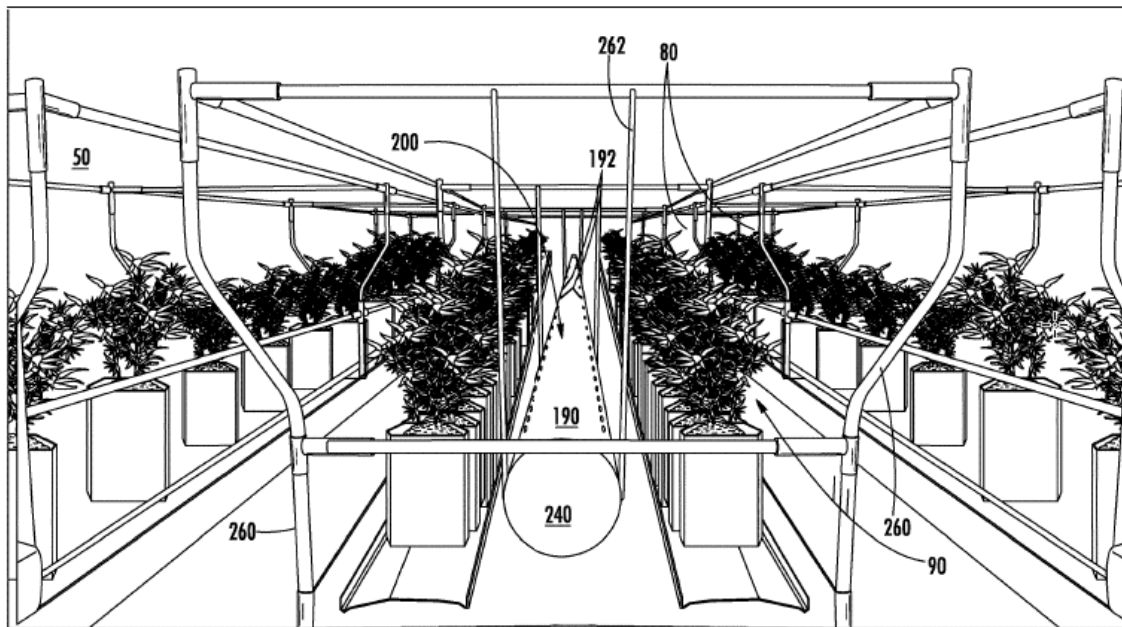


FIG. 2B

Figure 2B from Hutto shows an overview of a greenhouse with ducting running therethrough. Ex. 1008, 2:13–14. Hutto states that the disclosed directional air flow systems can be used in single duct or multi-duct systems. Ex. 1008, 2:55–67. For example, the Hutto patent states:

When set up inside a plant husbandry facility or greenhouse 50, duct runs 190 may be located between adjacent plant rows 170. Although FIG. 1B shows only one duct row 190, it should be appreciated that as shown in FIGS. 2A and 2B, *multiple duct rows 190 are possible*. The duct rows 190 may be straight as shown, and this is likely ideal to ensure airflow, but it is not required and other patterns are possible. The duct rows 190 may be located below the plant canopy 90, and situated such that the vent holes 192 are aligned upwards into the canopy 90.

The duct rows 190 may also be aligned level with the canopy 90 or in other orientations as long as vent holes 192 are aligned to direct airflow under the canopy 90.

Ex. 1008, 4:55–67 (emphasis added). Also, as shown in Figure 2B, scaffolding 260 and wiring 262 “may be used to orient and support individual circulation fans and duct runs 190. *Id.*, 5:25–26. Hutto additionally discloses that “[o]ther support systems may be used as well depending on space availability and height of the plant canopy 90.” *Id.*, 5:26–28.

a) Hutto As Prior Art

Patent Owner asserts that Petitioner “failed to establish what, if anything, in the disclosure of Hutto is prior art to the ‘099 patent.” PO Resp. 11.

Petitioner states that “[s]olely for the purposes of this Petition, Petitioners will assume that the priority date for the ‘099 Patent is August 24, 2017, the filing date of U.S. Provisional Patent Application No. 62/549,919 to which the ‘099 Patent claims priority.” 2nd Corr. Pet. 6. Petitioner also states that “Hutto was filed as provisional application No. 62/541,423 on August 4, 2017 and qualifies as prior art with regard to the ‘099 Patent under 35 U.S.C. § 102(a)(1).” *Id.* at 11.

In order for Hutto to be accorded an August 4, 2017 filing date based on its provisional application, Petitioner must establish that the specification of the Hutto *provisional* application contains a written description of the invention and the manner and process of making and using it, in such full, clear, concise, and exact terms to enable an ordinarily skilled artisan to practice the invention *claimed* in the Hutto *non-provisional* application, which in this proceeding became the Hutto patent. *Dynamic Drinkware*,

LLC v. National Graphics, Inc., 800 F.3d 1375, 1378 (Fed. Cir. 2015) (citing *New Railhead Mfg., L.L.C. v. Vermeer Mfg. Co.*, 298 F.3d 1290, 1294 (Fed. Cir. 2002)). The burden is on Petitioner “to prove that the prior art [Hutto] patent was entitled to the filing date of its provisional application.” *Dynamic Drinkware*, 800 F. 3d at 1378. The Hutto patent’s effectiveness as prior art depends on whether there is written description support for the claims of the issued Hutto patent in the provisional from which it claims priority. *Id.* at 1382. A reference patent is only entitled to claim the benefit of the filing date of its provisional application if the disclosure of the provisional application provides support for the claims in the reference patent in compliance with § 112, ¶ 1. *Id.* at 1381 (citing *In re Wertheim*, 646 F.2d 527, 537 (CCPA 1981)).

In its Reply, Petitioner submits “Claim Chart 1,” which compares each clause of claim 1 of the Hutto patent (Exhibit 1008) to the disclosure of the Hutto provisional application (Exhibit 1026) to establish that at least claim 1 of the Hutto patent is entitled to the filing date of the Hutto provisional application. Reply, 6–8. Petitioner also provides “Claim Chart 2,” which compares claims 25, 26, 58, and 59 of the challenged ’099 patent to the disclosure in the Hutto patent (Exhibit 1008) and to the disclosure in the Hutto provisional application (Exhibit 1026). *Id.* at 9–10.

Patent Owner asserts that Petitioner’s effort to establish that the Hutto patent is a prior art reference was untimely because it was not included in the Petition. Sur-reply 4 (Petitioner “did not attempt to timely establish any disclosure of Hutto to be prior art until after institution”). We disagree.

Dynamic Drinkware is very clear on this point. The petitioner in an *inter partes* review does not have the burden of producing evidence that the effective date of an asserted reference patent relates back to its claimed

provisional application until after a patentee challenges the prior art status of the asserted reference. *Dynamic Drinkware*, 800 F.3d at 1381 (“Dynamic did not have the burden of producing evidence relating to the Raymond provisional application until after National Graphics made its argument regarding reduction to practice. As a result, it was not necessary for Dynamic to prove in its petition that Raymond was entitled to the filing date of its provisional application.”). Thus, Petitioner did not waive any argument by asserting in its Petition that Hutto was entitled to its claimed earlier effective date. *Id.*

Patent Owner asserts that Petitioner “does not allege Hutto to be prior art in its entirety.” Sur-reply 4 (section heading III.A.1 (bold font and capitalization deleted)). In particular, Patent Owner asserts that Petitioner:

only sought to establish the Hutto provisional provided support in the Hutto patent for (a) the existence of ‘a flow distribution assembly,’ (b) the disclosure of a single duct assembly of Figure 1A having a housing air inlet portion with downward direction of air and horizontal direction of air into the single elongated duct, and (c) the fan directing ambient air into the housing.

Sur-reply 4 (citing Reply 9–10). The cited pages of Petitioner’s Reply refer to Petitioner’s Claim Chart 2, which, as discussed above, relates to asserting that Hutto’s provisional application (Ex. 1026) supports the priority claim of the Hutto patent (Ex. 1008) for selected clauses from challenged claims 25, 26, 58, and 59 in the ’099 patent. Although Patent Owner’s assertion may be correct, , Petitioner nonetheless establishes that the specification of the Hutto provisional application provides adequate support for the priority claim of the Hutto patent for at least the disclosure related to claim 1 in the Hutto patent.

In particular, Figure 1A from the Hutto provisional application (Ex. 1026) is shown below.

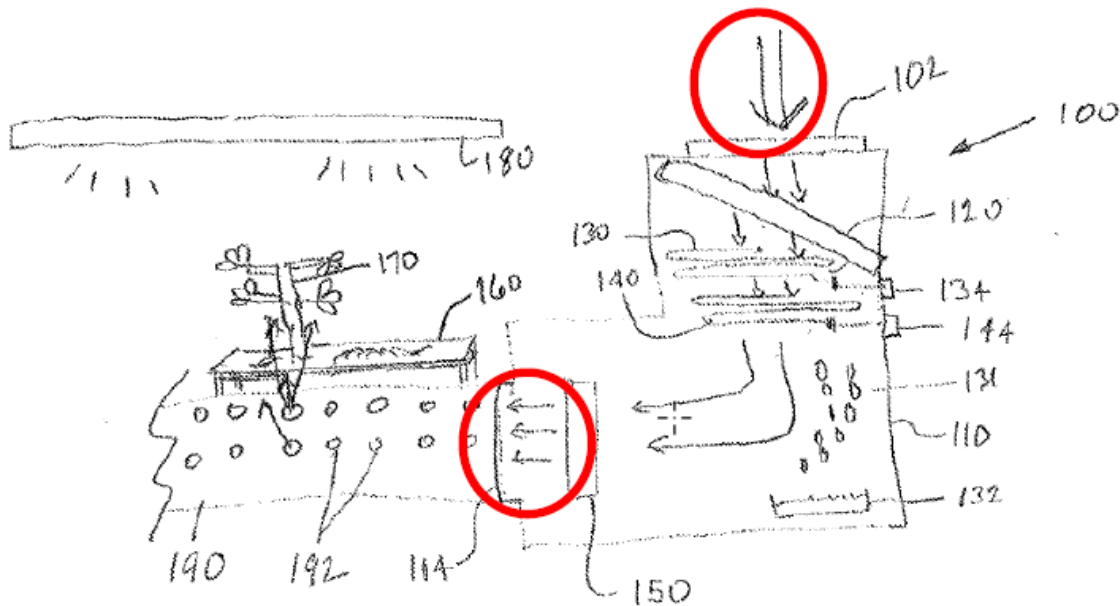
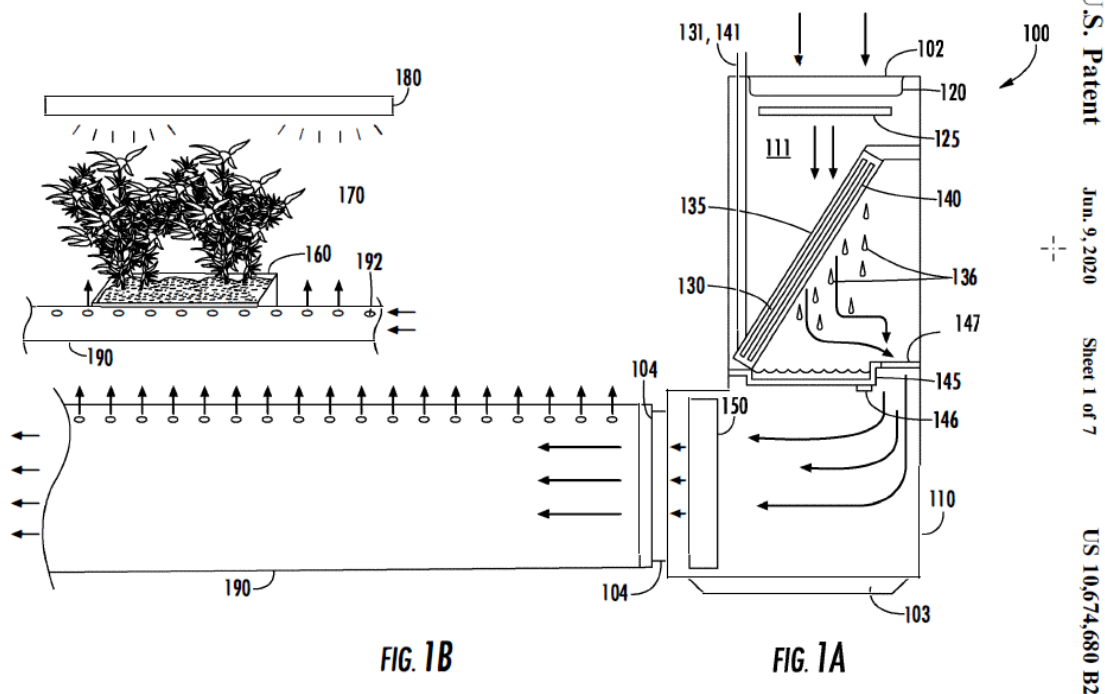


FIG. 1A

Figure 1A from the Hutto provisional application is the fan coil apparatus 100 shown within a greenhouse setting that includes grow tables 160 that holdplants 170 and grow lights 180. Ex. 1026, 13.¹³

¹³ We cited to the exhibit pagination of Exhibit 1026, which is page “13/35.” This exhibit is paginated in accordance with our rules. 37 C.F.R. § 42.63(d)(2)(i) (“Each page must be uniquely numbered in sequence”).

For convenient reference, we reproduce again below Figures 1A and 1B from the Hutto patent (Ex. 1008).



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A comparison of Figures 1A and 1B from the Hutto patent with Figure 1A from the Hutto provisional application readily establishes the substantive identity between the figures.

Moreover, Petitioner persuasively shows that the Hutto provisional application also provides support for the multiple duct rows 190 disclosed in the Hutto patent through the comparison of Figure 2B from the Hutto patent with Figure 2 from the Hutto provisional application. *See* Reply 9. For convenient reference we reproduce both figures below. Figure 2B from the Hutto patent is on the left, Figure 2 from the Hutto provisional application (Ex. 1026, 24) is on the right.

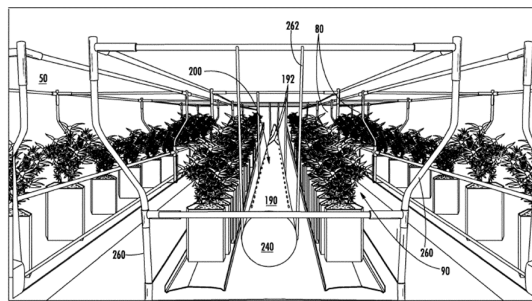


FIG. 2B



FIG. 2

The reproduced figures show an overview of a greenhouse with ducting running therethrough. *E.g.*, Ex. 1008, 2:13–14.

Both the Hutto patent and the Hutto provisional application state that the disclosed directional air flow systems can be used in single duct or multi-duct systems. Ex. 1008, 2:55–67; Ex. 1026, 4–5 (stating that “as shown in FIG. 2, multiple duct rows 120 are possible;” disclosing that “[s]caffolding 260 and wiring may be used to orient and support the fan 110 and duct runs 220.”).

Patent Owner asserts that “any disclosure of the Hutto provisional which is not disclosed in the Hutto patent is irrelevant.” Sur-reply 7. As explained above, the Hutto documents provide the same figures and written description about the directional flow path in Hutto and the option of using a multi-duct system.

Thus, based on the evidence and our analysis above, we determine that Petitioner has sufficiently established that the specification of the Hutto *provisional* application contains a written description of the invention and the manner and process of making and using it, in such full, clear, concise, and exact terms to enable an ordinarily skilled artisan to practice the

invention *claimed* in the Hutto *non-provisional* application, which in this proceeding became the Hutto patent. *Dynamic Drinkware*, 800 F.3d at 1378. Petitioner has established that the specification of the Hutto provisional application supports the priority claim of the Hutto patent for the disclosure related to claim 1 in the Hutto patent. Reply 6–8 (Claim Chart 1). This argument and evidence establishing Hutto’s priority claim, however, is consistent with Petitioner’s reliance on the Hutto patent in Ground 1. Indeed, Patent Owner recognizes this reliance on Hutto. *See* Sur-reply 4).

*b) Patentability of Claims 25 and 45
Based on Ellestad and Hutto*

In the Petition, Petitioner asserts that “to the extent that the subject claims are not obvious in view of Ellestad alone,¹⁴ they are obvious in view of Ellestad in combination with Hutto. 2nd Corr. Pet. 11. Petitioner also asserts that “Hutto discloses the particular [directional] limitation that formed the lone point of distinction of the Patent Owner's purported invention over the prior art.” *Id.*, 14; *see also* Ex. 1002, 594¹⁵ (Examiner’s statement of the “reasons for allowance.”). Petitioner concludes that “[i]t would have been obvious to a POSITA to modify the arrangement of components in Ellestad to incorporate the stated air path of Hutto.” 2nd Corr. Pet. 11.

This reliance on Hutto in the Petition, for the air flow directional limitation, is consistent with Petitioner’s assertions in its Reply.

¹⁴ We make no determination as to whether the challenged claims would have been obvious based on Ellestad alone because Petitioner has not asserted that position as a specific ground of unpatentability in this proceeding.

¹⁵ We cite to the Exhibit page number in the bottom right corner.

In its Reply, Petitioner asserts that “[a]s to claims 25 and 45, Ellestad discloses every claim element, except for the air flow directions.” Reply 10 (citing Pet. 12, 14). Petitioner relies on Hutto for the disclosure of air passing through the air inlet in a downward direction and the air passing through the air outlet into the elongated duct in a horizontal direction (the “air directional limitation”).

Patent Owner asserts that Figure 2 of the Hutto provisional application “only discloses a single duct.” Sur-reply 4. Patent Owner also asserts that “Figure 2B of the issued Hutto patent likewise does not disclose more than one duct.” *Id.*, 5. As Petitioner points out, however, Petitioner “relies on Ellestad for this [multi-platform] element.” Reply 12. Moreover, as we have explained above, it is beyond reasonable dispute that the Hutto documents each clearly disclose that the Hutto directional flow may be used in multi-duct systems. *See* Ex. 1008, 4:58–59 (“it should be appreciated that as shown in FIGS. 2A and 2B, multiple duct rows 190 are possible”); Ex. 1026, 4 (“it should be appreciated that as shown in FIG. 2, multiple duct rows 120 are possible”). Patent Owner’s argument is inconsistent with the disclosures of the Hutto documents and is not supported by any persuasive evidence.

Patent Owner concludes that “[t]he Hutto provisional and its figures do not disclose a multi-duct assembly with a downward intake to the housing. All disclosures *of more than one duct* in the provisional expressly disclose a horizontal intake.” Sur-reply 5 (emphasis added). Patent Owner does not cite any evidence to support this argument regarding a horizontal intake for systems with multiple ducts. As discussed above, the evidence is to the contrary.

The only air flow path disclosed in the Hutto patent and the Hutto provisional application is shown in Figure 1A of each document and described in the related written description. *See* Ex. 1008; Ex. 1026. As described and illustrated in the Hutto documents, the disclosed air flow path provides for air passing through the air inlet into the housing in a downward direction, and the air passing through the air outlet portion into an elongated duct in a horizontal direction. *E.g., see* Ex. 1008, Fig. 1A. Moreover, Patent Owner appears to concede that the Hutto documents disclose a downward intake for a one duct system, which it clearly does.

It is Petitioner's position that "[i]t would have been obvious to a POSITA to modify the arrangement of components in Ellestad to incorporate the stated air path of Hutto." 2nd Corr. Pet. 14. The reason why it would have been obvious with a reasonable expectation of success, according to Petitioner, is because, as stated in Hutto, Hutto's directional flow path eliminates the "condensation" problem in the air intake. *Id.* It also would be a "design choice." *Id.* (citing Ex. 1003, ¶¶ 26–27); *see also* Reply 10 (asserting "flow direction is one of the most routine, mundane changes one can make to a ventilation system, and it is often done in response to other design constraints.") (citing Ex. 1003, ¶¶ 26–27).

Patent Owner also asserts that the prior art, including Ellestad, does not disclose air flow system where "the entire distribution system is mountable on a rack, including the fan and housing and two adjacently extending ducts." Sur-reply 9. We disagree. In Ellestad, the entire system is rack-mounted. Moreover, Patent Owner's argument fails to recognize that claim 25 *does not* include a "rack" as an element of the claim. Claim 25 states that the claimed "elongated duct" is merely "configured to be positioned upon and extend along a rack." A "rack" is included in claim 45.

As stated in our summary of the Ellestad disclosure, Ellestad describes indoor farming modules containing mechanical racking systems which may be coupled or uncoupled to an indoor farming module, be freestanding, and may contain horizontal racks/levels. Ex. 1006 ¶ 64. An integrated air flow management system and an irrigation system may be contained on each level of the indoor farming module. *Id.* ¶¶ 65–66. The integrated air flow management system includes a lighting apparatus, an air flow generator for generating air flow, and an air duct with variable area vents “that allow air to flow through to the crop canopy at variable rates and volumes.” *Id.* ¶ 65.

Figure 5 of Ellestad is reproduced below:

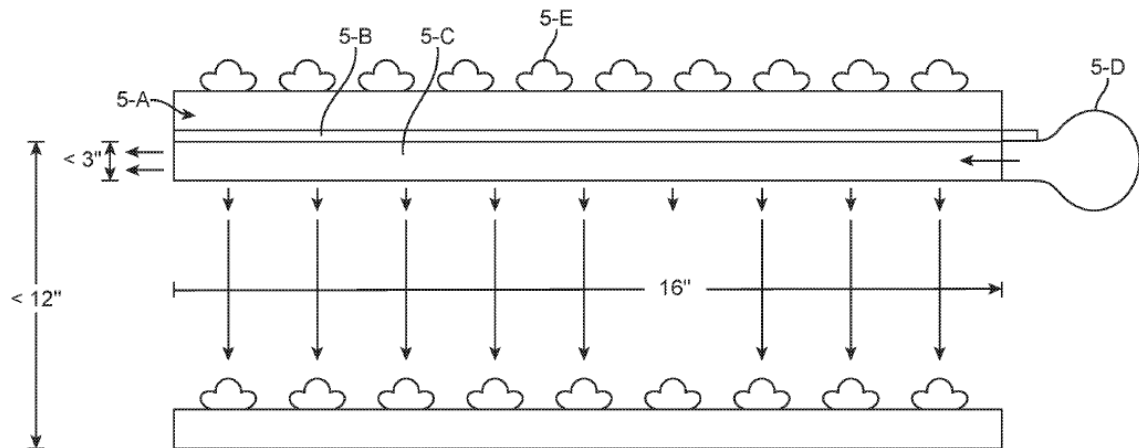


FIG. 5

Figure 5 is an illustration of “an integrated airflow management lighting system.” Ex. 1006 ¶ 29.

As shown in Figure 5, the integrated airflow management lighting system includes “irrigation plumbing (‘5-A’), a lighting system (‘5-B’), transparent and/or reflective duct (‘5-C’), an airflow generator (‘5-D’), and crops (‘5-E’).” *Id.* ¶ 73. There may be variable air vents included in the

transparent and/or reflective duct and the integrated airflow management system to “ensure there is adequate air circulation throughout the plant canopy while enabling ultra-high density crop production.” Ex. 1006 ¶ 73. Notably, and contrary to Patent Owner’s assertion, each level of an indoor farming module may contain an integrated air flow management system. *Id.* ¶ 65.

Accordingly, we determine that Petitioner has met its burden to establish that claims 25 and 45 would have been obvious based on Ellestad and Hutto.

*c) Patentability of Claims 26 and 50
Based on Ellestad and Hutto*

Claim 26, dependent from claim 25, and claim 50, dependent from claim 45, are similar in that they each state that there is a second elongated duct fluidly coupled to a second outlet portion of the housing. Claims 26 and 50 also state that both elongated ducts are “positionable upon a rack.”

In the Petition, Petitioner relies on the embodiment in Figure 15 of Ellestad for the disclosure of the claimed elements. 2nd Corr. Pet. 15.

Figure 15 from Ellestad is reproduced below.

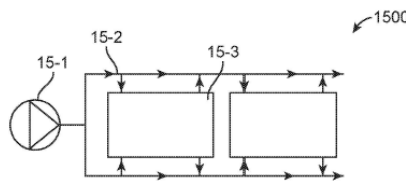


FIG. 15

Figure 15 in Ellestad “illustrates a top view of a lighting system 1500 having a third airflow system, in accordance with embodiments.” Ex. 1006 ¶ 88. Figure 15 “illustrates airflow piping of air that is generated by the pressurized blower (15-1),” with “airflow piping (15-2) [] provided around the LED fixtures (15-3).” *Id.* Based on this disclosure and Figure 15, we

determine that the airflow piping is “fluidly coupled to a *second outlet portion of the housing*,” as required by claims 26 and 50.

In its Petition, and referring to Ellestad, Petitioner also states:

Figs. 10–14 and [0065] and [0084] discusses directing vertical airflow 11-5 through air holes/air vents, toward plants 10-4 below the duct), wherein the second elongated duct extends adjacent to the elongated duct from the filter housing (Ex. 1006, Fig. 15) such that the flow distribution assembly with the elongated ducts is positionable upon a rack (Ex. 1006, last sentence of [0064] and first sentence of [0065]). Hutto also discloses having multiple duct rows, and specifies that other patterns are possible.¹⁶ Ex. 1008, Col. 4:55—62.

2nd Corr. Pet. 15.

Petitioner concludes from the quoted argument that “[a]s such, the additional limitation of claim 26 is disclosed. Indeed, multiple ducts are matters of routine optimization.” *Id.* (citing Ex. 1003 ¶ 73; Ex. 1015).

Here the weight of the Ellestad and Hutto disclosures regarding the use, structure, and function of multi-duct systems provide persuasive evidence that meets Petitioner’s burden to establish that fluidly coupling the two branches of airflow piping 15-2 to a second outlet portion of the housing would have been obvious to a person of ordinary skill, as required in the context of claims 26 and 50.

¹⁶ Petitioner has stated repeatedly that it is relying on Hutto solely for the airflow directional limitation. *E.g.*, Reply 14 (“Again, Hutto is relied on for the downward airflow. Ellestad discloses all the other elements.”). Thus, Petitioner’s reference to Hutto seems misplaced and inconsistent with this asserted ground of unpatentability.

*d) Patentability of Claim 27
Based on Ellestad and Hutto*

Claim 27 depends from claim 26 and thus includes all its elements and limitations. Claim 27 further limits claim 26 by stating that the two elongated ducts are spaced. Ellestad clearly illustrates and discloses that its two elongated ducts in Figure 15 are “spaced,” as required by claim 27. Accordingly, we determine that Petitioner meets its evidentiary burden to establish that claim 27 is unpatentable.

*e) Patentability of Claims 58 and 59
Based on Ellestad and Hutto*

Claim 58, dependent from claim 45, states that the “fan directs ambient air into the housing.” Claim 59, also dependent from claim 45, states “the fan directs the ambient air¹⁷ in a downward direction and the elongated duct is oriented in a horizontal direction.”

In the Petition, for claims 58 and 59, Petitioner refers us to claim 45 and to Hutto. 2nd Corr. Pet. 19.

Patent Owner asserts that because “the fan of Hutto *draws* air into the housing, but then *directs* the air into the duct, [it] negates any beneficial plenum function the claimed orientation of the housing, inlet and outlet provide.” PO Resp. 25 (emphases added); *see also* Sur-reply 10 (“asserting that Petitioner’s argument “ignores the fact that Hutto’s placement of the fan at the outlet of the purported housing and directly into the duct negates the plenum function of the housing”). There is no “plenum function” recited in these claims. Moreover, our construction of the term “housing” did not include a plenum in the housing. *See* Sec. II.C.3 of this Decision. For claim

¹⁷ We note that there is no antecedent in claim 45 for the reference to “the ambient air.”

59, Patent Owner asserts that in Hutto “the fan *directs* air in a horizontal direction.” PO Resp. 25.

Petitioner asserts that “[w]hether one directs air by pulling it or by pushing it, the physics are the same. Hutto’s fan directs ambient air into the housing, and as to claim 59, it does so in a downward direction.” Reply 15. Petitioner also cites dictionary definitions for the words “draw and “direct” (*id.*, *see Exs.* 1050, 1051) but the dictionaries merely establish that these words can have various meanings dependent on the context. Here, these dictionary definitions have minimum probative value. We agree, however, with Petitioner. Hutto’s fan is the only element that causes movement of air. When the fan is activated, the fan causes air to move in a downward direction through the housing and also causes the air to move horizontally through the elongated duct. We determine that this meets the requirements of the claims.

Accordingly, we determine Petitioner has met its burden of proof to establish that claims 58 and 59 are not patentable.

3. *Conclusion for Ground 1*

Based on the evidence and the analysis above, we determine that Petitioner has met its burden of proof to establish that all the challenged claims, which are claims 25–27, 45, 50, 58, and 59, are not patentable.

III. CONCLUSION¹⁸

Petitioner has established by a preponderance of the evidence that all the challenged claims, which are claims 25–27, 45, 50, 58, and 59, are

¹⁸ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner’s attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or*

unpatentable based on Ground 1, Ellestad and Hutto. Having determined that all the challenged claims are unpatentable as obvious over Ellestad and Hutto, we need not further address Petitioner's challenge based on other references in the other asserted grounds.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Petitioner has shown by a preponderance of the evidence that claims 25–27, 45, 50, 58, and 59 are unpatentable;

FURTHER ORDERED that, because this is a Final Written Decision, the parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

Reexamination During a Pending AIA Trial Proceeding. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. §§ 42.8(a)(3), (b)(2).

V. SUMMARY TABLE

Claim(s)	35 U.S.C. §	Reference(s)/Basis	Claim(s) Shown Unpatentable	Claim(s) Not Shown Unpatentable
25–27, 45, 50, 58, 59	103	Ellestad, Hutto	25–27, 45, 50, 58, 59	
25–27, 45, 50, 58, 59	102	Takashima ¹⁹		
25–27, 45, 50, 58, 59	103	Takashima, Abe, Fujio ¹⁹		
25–27, 45, 50, 58, 59	103	Fujio, Abe ¹⁹		
Overall Outcome			25–27, 45, 50, 58, 59	

¹⁹ As noted above, because we find that claims 25–27, 45, 50, 58, and 59 are unpatentable over Ellestad and Hutto, we do not reach whether those same claims would have been unpatentable based on Petitioner’s other grounds.

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