

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD. AND SAMSUNG
ELECTRONICS AMERICA, INC.

Petitioners

v.

MANUFACTURING RESOURCES
INTERNATIONAL, INC.

Patent Owner

Case IPR2023-00220

U.S. Patent No. 9,173,322

PATENT OWNER'S PRELIMINARY RESPONSE

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EXHIBIT LIST

Exhibit	Description
2001	MRI-ITC-1331_0000435123-24 (4/24/2020 Romulus Stoain email to Dunn)
2002	MRI-ITC-1331_0000435125-27, Mutual Non-Disclosure Agreement
2003	MRI-ITC-1331_0000435133-34 (5/4/2020 Romulus Stoain email to Dunn)
2004	MRI's Opening Claim Construction Brief filed in <i>In the Matter of Certain Outdoor and Semi-Outdoor Electronic Displays</i> , Inv. No. 337-TA-1331
2005	U.S. Provisional Patent Application 61/039,454

I. INTRODUCTION

Patent Owner Manufacturing Resources International, Inc. (“MRI”) is a world-wide leader in the market for high-performance electronic displays for use in outdoor and semi-outdoor environments. Over the past 15+ years, MRI has made substantial advancements in outdoor and semi-outdoor electronic display technology and holds hundreds of U.S. and foreign patents. Cooling systems are critical to the successful use of electronic displays in outdoor and semi-outdoor environments. The claims of the ’322 Patent are directed to systems and products for effectively and efficiently cooling outdoor and semi-outdoor electronic displays using, for example, constricted convection cooling and/or closed loop gas circulation, which improve removal of heat generated by an electronic display.

Samsung, which is one of the largest manufacturers of LCD screens in the world, itself has praised the patented innovations in MRI’s products and sought to engage in collaborative efforts with MRI to “embrace the MRI technology [] blended in with Samsung displays.” Ex. 2001. Petitioners Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. (collectively, “Petitioners”) failed to address objective indicia of non-obviousness of which Petitioners were aware before filing the Petition. For example, Petitioners were aware of allegations of secondary considerations raised in the complaints in related proceedings. Petitioners were also aware of other evidence of secondary considerations that has

since been produced under a protective order in the ITC proceeding, in addition to the pre-suit correspondence from Samsung to Patent Owner praising the technology central to the '322 Patent attached as exhibits to this response.

The Board has repeatedly “cautioned petitioners in prior proceedings that petitions may be denied if they do not address known evidence of secondary considerations,” and Petitioners cannot simply ignore “the most probative and cogent evidence” of non-obviousness when it has been developed in the public record. *Stryker Corp., et al. v. KFx Medical, LLC*, IPR2019-00817, Paper 10, at 28-29 (PTAB Sept. 16, 2019); *Robert Bosch Tool Corp. v. SD3, LLC*, IPR2016-01751, Paper 15, at 15-16, 23-34 (PTAB Mar. 22, 2017). Even if Petitioners were not aware of some of the evidence of secondary considerations prior to filing the Petition, Petitioners should have addressed at least the Samsung emails praising Patent Owner’s patented technology. In addition, additional substantial evidence of secondary considerations with a nexus to the patented MRI outdoor and semi-outdoor display products has been produced in the pending ITC litigation, including evidence of industry praise, copying, commercial success, long-felt need, and unsuccessful attempts by others, but is not yet available for use in an IPR proceeding.

Second, the obviousness combinations proposed in the Petition lack articulated reasoning with a rational underpinning to support a legal conclusion of

obviousness. *See Norman International, Inc. v. Andrew J. Toti Testamentary Trust et al.*, IPR2014-00283, Paper 9 at 20–22 (PTAB Jun. 20, 2014) (rejecting multiple proposed obviousness grounds because “Petitioner has not provided sufficient articulated reasoning with rational underpinning as to why an ordinary artisan . . . would have had a reason to combine the prior art elements”). Instead, the Petition provides mere conclusory statements that the claims are obvious and lacks any cogent reasoning as to why a person of ordinary skill in the art would modify or combine the cited references in the manner recited by the challenged claims of the ’322 Patent. For this additional independent reason, the Board should deny all grounds set forth in the Petition.

Moreover, there are compelling technical reasons why Petitioners’ proposed combinations would have been far from obvious to one of ordinary skill in the art at the time of the challenged inventions. Thus, the Petition on its face fails to show a reasonable likelihood of success as to any asserted ground, and Patent Owner respectfully requests that the Board deny all grounds in the Petition.

II. BACKGROUND

A. Overview of the ’322 Patent

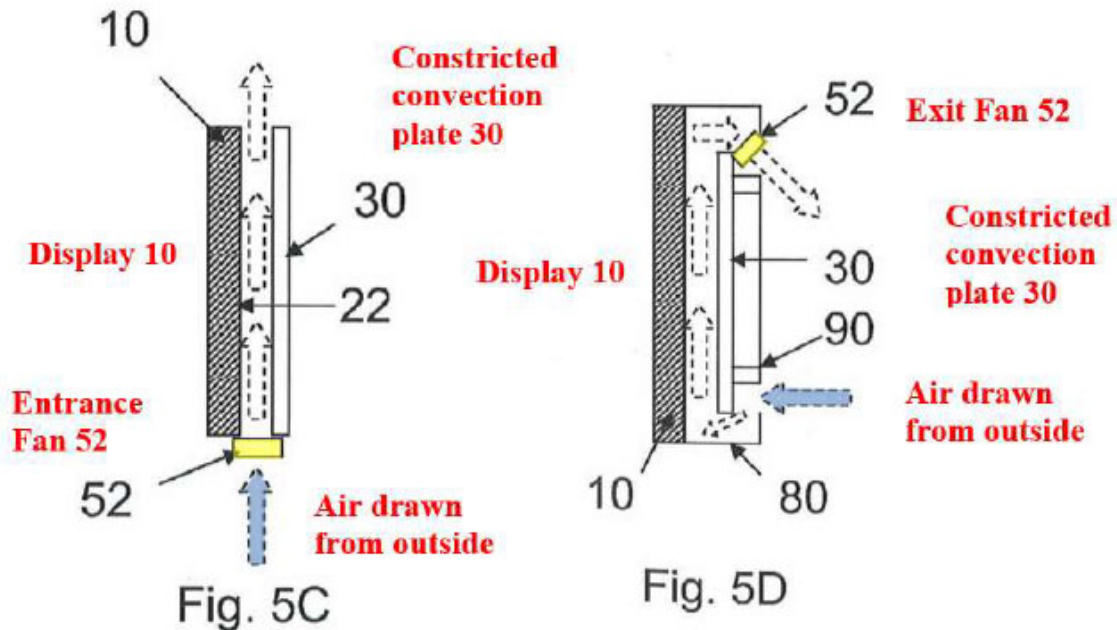
The ’322 Patent discloses and claims a cooling system for electronic displays. As the patent acknowledges, “[c]onductive and convective heat transfer systems for electronic displays are known.” Ex. 1001, 1:52-53. For example, some

prior art systems “relied primarily on fans for moving air past the components to be cooled and out of the display.” Ex. 1001, 1:56-58. In some systems, “the heated air is moved into convectively thermal communication with fins.” *Id.*, 1:58-59. And some systems “utilize conductive heat transfer from heat producing components directly to heat conductive housings for the electronics.” *Id.*, 1:59-62. In these systems, “heat is transferred convectively or conductively to the housing and is then transferred into the ambient air from the housing by natural convection.” *Id.*, 1:64-67.

These systems, however, do not provide adequate cooling in many climates or for electronic displays with larger screen sizes which necessarily generate more heat that is transferred into the display module. *Id.*, 2:11-19. The claimed cooling systems address these drawbacks by using a combination of a closed loop of isolated gas circling within the housing, an open loop of ambient air passing through the housing, and cooling created by a constricted convection channel. Ex. 1001 at 7:64-9:5.

The constricted convection feature of MRI’s inventions is shown in the annotated figures below. In the ’322 Patent, a constricted convection channel for cooling is formed behind the display using a constricted convection plate positioned behind the posterior surface of the display such that air may be forced

into the gap between the constricted convection plate and the posterior surface of the display. *Id.*, 2:30-42, 6:22-24, 6:32-34; FIGS. 5B-5F.



Id., Figs. 5C, 5D (annotated); Ex. 2004 at 4.

Fans move air through the narrow channel behind the display, from an entrance to an exit, to remove heat from the electronic display posterior 22. *See e.g.*, Ex. 1001 at 6:30-37. As explained in the '454 Provisional, the narrowing of the airflow path by the constricted convection channel 50 increases the effectiveness of the heat transfer from the display to the air. Ex. 2005 at [0032]. This constricted convection cooling of the backlight allows for exemplary cooling of large format screens in outdoor environments. Ex. 1001 at 4:8-15. Further, it results in a system able to achieve **consistent** cooling of screens of different sizes,

even when they are exposed to heat from the sun in hot climates over extended periods of time. *Id.*, 3:58-67.

The external housing preferably includes an air entrance aperture and an air exit aperture. *Id.*, 2:46-49. The air entrance aperture and an air exit aperture cooperate to facilitate a flow of outside cooling air into one side of the housing, through one open end of the constricted convection cooling channel that is located behind the posterior surface of the display, and out the opposite end of the constricted convection cooling channel and another side of the housing. *Id.*, FIGS. 5B-5F. One or more fans may be positioned and oriented to draw and/or blow external air through the constricted convection cooling channel. *Id.*, 5:45-54; FIGS. 5B-5F. The use of fans increases the rate at which heat is removed from the display posterior by the air traveling through the constricted convection cooling channel. *Id.*, 5:54-58.

Side panels may be provided to help direct air through the constricted convection cooling channel. *Id.*, 4:67-5:4. In an exemplary embodiment, the side panels may be angled side panels that extend from the constricted convection plate and may contact the display exterior. *Id.*

The constricted convection cooling system embodiments of the '322 Patent are described as being able to cool an electronic display assembly in a uniform

manner and to reduce temperature fluctuations even when used with large display screens that generate more heat than smaller display screens. *Id.*, 3:5, 63-67.

B. Secondary Considerations Presented in Related Proceedings Demonstrate the Non-Obviousness of the Challenged Claims

There are multiple objective indicia of non-obviousness for the '322 Patent with a nexus to MRI's outdoor and semi-outdoor electronic display products, which practice the '322 Patent, including at least industry praise, commercial success, long felt need, unsuccessful attempts by others, and copying. Petitioners at least knew about evidence of industry praise and commercial success before filing the Petition because it was Samsung itself that praised MRI's patented products. *See* Exs. 2001-2003. MRI's BoldVu® products have been praised in the field of electronic displays for their ability to withstand high ambient temperatures and high solar load and draw little energy for cooling systems. Real-party-in-interest Samsung SDS America praised MRI's technical achievements and commercially successful entry into the outdoor display market. On April 24, 2020, Samsung SDS America told MRI:

What you've done at MRI *it's impressive and unique*; I bet was not easy entering into a virgin space and then shortly after being able to pioneer a new business model based on turnkey solutions for DOOH [Digital Out Of Home], *raising the bar for high quality standards*.

Per our conversation, *I see loads of opportunities for collaboration in the outdoor space* (smart city, transit, rail, etc) *where we can embrace*

the MRI technology and blended in with Samsung displays. Our customers will benefit from quality products and executions.

Ex. 2001 (MRI-ITC-1331_0000435123-24 (4/24/2020 Romulus Stoain email to Dunn) (emphasis added)). Samsung SDS America even attempted to enter into a “Mutual Non-Disclosure Agreement” with MRI. Ex. 2002 (MRI-ITC-1331_0000435125-27). Samsung SDS America’s representative, Stoain, told Dunn that he “spoke internally and [Petitioner] Samsung Electronics is looking for *a key partner in outdoor enclosures.*” Ex. 2003 (MRI-ITC-1331_0000435133-34 (5/4/2020 Romulus Stoain email to Dunn)).

Here, the objective evidence ties directly to the claimed features. For example, the praise above directly discusses Samsung’s belief that Patent Owner would be a “key partner in outdoor enclosures,” and that Patent Owner’s innovations are both “impressive and unique” and “rais[e]the bar for high quality standards.” In particular, Samsung saw “loads of opportunities for collaboration in the outdoor space (smart city, transit, rail, etc) where we can embrace the MRI technology and blended in with Samsung displays.” Ex. 2001. This praise is all tied directly to the claimed invention, i.e., systems and products for effectively and efficiently cooling outdoor and semi-outdoor electronic displays using an open loop airflow pathway and closed loop airflow pathway in combination with heat exchangers, polarizers, and anti-reflective films. Such systems are exactly what

makes these outdoor displays possible—through enabling efficient cooling while still protecting sensitive internal components from the elements.

C. Related Proceedings

The '322 Patent was the subject of a civil action in the United States District Court for the District of Delaware filed by MRI on March 14, 2017, naming Civiq Smartscapes, LLC, Civiq Holdings, LLC, Comark, LLC and Comark Holdings, LLC as Defendants, *Manufacturing Resources International, Inc. v. Civiq Smartscapes, LLC, et al.*, No. 1:17-cv-00269-RGA (D. Del. filed on Mar. 14, 2017). The case settled.

Patent Owner filed a complaint against Petitioners in the Eastern District of Texas and in the International Trade Commission to enforce the '322 Patent on August 19, 2022. *In the Matter of Certain Outdoor and Semi-Outdoor Electronic Displays*, Inv. No. 337-TA-1331; *Manufacturing Resources International, Inc. v. Samsung Electronics Co., Ltd. Et al.*, No. 2:22-cv-00320 (E.D. Tex.). The Eastern District of Texas litigation was stayed on October 25, 2022. The ITC hearing is scheduled for June 26-30, 2023, with an Initial Determination due September 22, 2023, and the target date for completion is January 22, 2024.

D. The Petition's Cited References

Petitioners identify eight references as alleged prior art. The Petition primarily relies on the following four references:

- U.S. Patent 7,800,706 to Kim (Ex. 1005);
- Korean Published Unexamined Patent Application No. KR 10-2006-0016469 to Na (Exs. 1009, 1010);
- U.S. Patent Application Publication US 2006/0199514 to Kimura (Ex. 1004); and
- U.S. Patent Application Publication US 2006/0132699 to Cho (Ex. 1006).

For at least the reasons discussed below, Petitioners have failed to show that there is a reasonable likelihood that any of the references invalidate any claim of the '322 Patent, either alone or in combination.

III. LEVEL OF ORDINARY SKILL IN THE ART

The relevant field of art is large format electronic displays for use in outdoor settings or environments of high thermal stress. Contrary to Petitioners' assertion, the level of skill in the art would be low, and a POSITA would have the following qualifications:

A bachelor's degree in a pertinent discipline, such as mechanical or electrical engineering, physics, applied physics, or a related field. Such a person would also have had 2-4 years of experience in working with electronic displays including thermal management associated with electronic displays. Alternatively, a POSITA would have had 4-6 years of experience in the field and would have developed a similar understanding of thermal management associated with electronic displays.

Ex. 2004 (MRI's Opening Claim Construction Brief, pp. 12-13). While the POSITA has experience with thermal management, he or she does not necessarily

have an understanding of product design issues and failure modes associated with electronic displays. Pet. at 10.

IV. CLAIM CONSTRUCTION

Petitioners ask the Board to construe four terms without any analysis or citation to evidence supporting their construction. For two of the terms—“between” and “substantially parallel”—Petitioners ask the Board to adopt the district court’s constructions from a prior litigation without any discussion or citation to evidence in support of those constructions. Pet. at 15. Rather, Petitioners simply cite to the District Court *Markman* Order (Exs. 1011, 1012) in an improper attempt to incorporate the court’s reasoning by reference. *See* 37 C.F.R. § 42.6(a)(3); *see also* Rules of Practice for Trials Before The Patent Trial and Appeal Board and Judicial Review of Patent Trial and Appeal Board Decisions; Final Rule, 77 Fed. Reg. 48,612, 48,617 (Aug. 14, 2012) (prohibition against incorporation by reference is to eliminate abuses that arise from incorporation). By incorporating by reference the arguments and analysis from the Order into the Petition, Petitioners circumvent the page limits imposed on petitions for *inter partes* review. The Board should not consider information that is not provided in the Petition but is instead incorporated by reference to the cited Order. IPR2015-00442, Paper 9 at p. 9. A petition for *inter partes* review must identify how each

challenged claim is to be construed. *See* 37 C.F.R. § 42.104(b)(3). The Petition's improper incorporation by reference fails to meet this requirement.

For the remaining two terms, Petitioners propose constructions, without any discussion or supporting evidence. This is insufficient under 37 C.F.R. § 42.104(b)(3). Moreover, Petitioners' failure to provide any rationale or support for their constructions is inexplicable given it proposes a construction for the term "liquid crystal stack" in their obviousness analyses and provides discussion and allegedly supporting citations to the specification there.

V. THE BOARD SHOULD DENY THE PETITION BECAUSE THE ALLEGED OBVIOUSNESS GROUNDS ARE DEFECTIVE

A. Petitioners Do Not Address Objective Indicia of Non-Obviousness

MRI and Samsung are direct competitors, and discovery in the parallel ITC proceeding has revealed not only substantial evidence of secondary considerations, which will be developed should IPR be instituted, but also that Samsung was the source of some of that evidence of commercial success and industry praise. Yet, while Petitioners alleged they were not aware of any secondary considerations (Pet. at 116), Petitioners have produced evidence under a protective order in the parallel ITC proceeding demonstrating Petitioners at least knew of evidence of industry praise directly tied to the claimed invention and had the evidence in their possession before filing, as set forth above in Section II.B.

Objective evidence “may often establish that an invention appearing to have been obvious in light of the prior art was not.” *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1349 (Fed. Cir. 2012). In fact, “[i]t is the secondary considerations that are often most probative and determinative of the ultimate conclusion of obviousness or nonobviousness.” *Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc.*, 75 F.3d 1568, 1573 (Fed. Cir. 1996). “Evidence that the industry praised a claimed invention or a product that embodies the patent claims weighs against an assertion that the same claimed invention would have been obvious. Industry participants, especially competitors, are not likely to praise an obvious advance over the known art. Thus, if there is evidence of industry praise of the claimed invention in the record, it weighs in favor of the non-obviousness of the claimed invention.” *Apple Inc. v. Samsung Elecs. Co., Ltd.*, 839 F.3d 1034, 1053-54 (Fed. Cir. 2016) (en banc).

Importantly, “[a]ll of the *Graham* factors must be considered, including the objective indicia when present, before any conclusion regarding obviousness is reached.” *Millennium Pharm., Inc. v. Sandoz Inc.*, 862 F.3d 1356, 1367-68 (Fed. Cir. 2017) (citations omitted); *see also Ortho-McNeil Pharm., Inc. v. Mylan Labs., Inc.*, 520 F.3d 1358, 1365 (Fed. Cir. 2008) (stating that objective indicia are “not just a cumulative or confirmatory part of the obviousness calculus but constitute[] independent evidence of nonobviousness”). “These indicia **cannot** be set aside in

the analysis of obviousness.” *Millennium Pharm., Inc.*, 862 F.3d at 1368 (emphasis added). Yet, this is exactly what Petitioners sought to do, claiming they were “not aware of any evidence of secondary considerations of nonobviousness.” Pet. at 116.

Petitioners ignored that commercial success and industry praise are evidence of secondary considerations and that ***Samsung*** acknowledged MRI’s commercial success and was a source of such praise. *See id.* (“Petitioners are not aware of any evidence of secondary considerations of nonobviousness, such as commercial success, alleged long felt but unresolved need, alleged failure of others, or copying by others.”). Praise from a competitor is “especially” important as “competitors, are not likely to praise an obvious advance over the known art.” *Apple*, 839 F.3d at 1053-54.

In any event, the objective indicia of non-obviousness in this case, such as that set forth in Section II.B, is compelling and overwhelms any of Petitioners’ invalidity arguments. The determination of whether a patent claim is invalid as obvious under § 103 requires consideration of all *Graham* factors, including evidence of secondary considerations. *Apple*, 839 F.3d at 1047-48 (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966); *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007)). Any obviousness determination must consider all the

Graham factors, and Petitioners' ignorance of addressing these factors is another ground for denying institution.

Moreover, because Petitioners were aware of their own statements, including praise of the patented invention, at the time they filed the Petition, Petitioners should not be allowed to supplement their Petition through Reply or otherwise to address evidence it should have addressed in the first instance. *See, e.g., Robert Bosch Tool Corp. v. SD3 LLC*, IPR2016-01751, Paper 15 at 22-33 (PTAB Mar. 22, 2017) (denying institution for failure to address objective indicia presented during an ITC proceeding); *see also Coalition for Affordable Drugs V LLC v. Hoffman-LaRoche, Inc.*, IPR2015-01792, Paper 14 at 17-18 (PTAB Mar. 11, 2016) (denying institution for failure to address objective indicia considered by Examiner during original prosecution); *see also Merial Ltd. v. VIRBAC*, IPR2014-01279, Paper 13 at 27-28 (PTAB Jan. 22, 2015) (denying institution for failure to address objective indicia considered by Examiner during original prosecution and noting "Merial was aware of the unexpected results showing which the Examiner found persuasive Merial should have addressed unexpected results in the first instance."); *Omron Oilfield & Marine Inc. v. MD/TOTCO*, IPR2013-00265, Paper 11 at 12-16 (PTAB Oct. 31, 2013) (denying institution for failure to address objective indicia successfully argued in a reexamination).

B. The Petition Does Not Show Alleged Unpatentability with Particularity

For every Ground, Petitioners fail to particularly identify their proposed arguments and supporting evidence, as required for institution. In particular, Petitioners do not—for any ground—explain how the references are purported to be combined or how the proposed combinations allegedly teach each element of the claims. This insufficient analysis does not warrant institution.

Under 35 U.S.C. § 314(a), an IPR can be instituted only if “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). Under § 314, the Board is required to make “a binary choice—either institute review or don’t.” *SAS Institute Inc. v. Iancu*, 138 S. Ct. 1348, 1355 (2018); *see also* Consolidated Trial Practice Guide (PTAB Nov. 2019) (“CTPG”), at 5. Even when a petitioner demonstrates a reasonable likelihood as to at least one claim, however, institution of an IPR remains discretionary. *SAS*, 138 S. Ct. at 1356 (“§ 314(a) invests the Director with discretion on the question *whether* to institute review”) (emphasis in original); *Cuozzo Speed Techs., LLC v. Lee*, 579 U.S. 261, 273 (“[T]he agency’s decision to deny a petition is a matter committed to the Patent Office’s discretion.”). This discretion “is informed by 35 U.S.C. [§] 316(b) . . . which require[s] the Director to ‘consider the effect of any such regulation [under this section] on the economy, the integrity of the patent system, the efficient administration of the Office, and the ability of the

Office to timely complete proceedings instituted under this chapter.” CTPG at 56 (quoting 35 U.S.C. § 316(b)).

The Board has previously explained that in light of the “all-or-nothing” approach mandated by *SAS*, “[t]he statutory requirement for particularity in a petition for IPR takes on heightened importance” and that, therefore, “the Board may consider whether a lack of particularity as to one or more of the asserted grounds justifies denial of an entire petition.” *Adaptics Ltd. v. Perfect Co.*, IPR2018-01596, Paper 20 at 17 (PTAB Mar. 6, 2019). Such a denial is justified here.

Petitioners fail to particularly identify their proposed arguments and supporting evidence, such as by failing to explain how the references are purported to be combined or how the proposed combinations allegedly teach each element of the claims. Rather, Petitioners have taken a number of improper shortcuts, rendering their arguments unclear and imprecise, and improperly shifting the burden of deciphering them onto Patent Owner and the Board. Petitioners therefore have failed in their burden of arguing with sufficient particularity.

Accordingly, even if the Board were to find that Petitioners demonstrate a reasonable likelihood of prevailing with respect to at least one ground (which Patent Owner disputes), *SAS* would also require institution of these all grounds that Petitioners have failed to argue with requisite particularity. Instituting *inter partes* review of all these grounds based on evidence and arguments directed with

particularity to only a few of the Petition’s grounds would not be an efficient use of the Board’s time and resources. *See Deeper, UAB v. Vexilar, Inc.*, IPR2018-01310, Paper 7 at 41-43 (PTAB Jan. 24, 2019) (informative); *Chevron Oronite Company LLC v. Infineum USA L.P.*, IPR2018-00923, Paper 9 at 10-11 (PTAB Nov. 7, 2018) (informative).

To support the efficient administration of the Patent Office, the Board should exercise its discretion to deny institution.

1. Ground 1 Lacks Particularity

The Petition asserts in Ground 1 that Kim in combination with Hong renders obvious claims 4 and 7. Pet. at 30-40. Ground 1 fails to satisfy § 312(a)(3) at least because Petitioners use imprecise language, making it unclear what, if any, combination of prior art references Petitioners propose be combined. For example, for every claim or claim element, the Petition asserts “Kim and Hong renders [the claim/limitation] obvious.” Pet. at 30, 31, 32, 36, 38, 41. However, for nearly all of the limitations, Petitioners only provide citations to Kim. Indeed, claim 4[b] is the only element where Petitioners cite disclosure in Hong. Pet. at 34-36. However, in that discussion, Petitioners do not expressly propose combining Kim and Hong or modifying Kim based on Hong. *Id.*

A patent challenger holds the “burden to demonstrate both ‘that a skilled artisan would have been motivated to combine the teachings of the prior art

references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.’’ *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367–68 (Fed. Cir. 2016) (quoting *Kinetic Concepts, Inc. v. Smith & Nephew, Inc.*, 688 F.3d 1342, 1360 (Fed. Cir. 2012)). Petitioners do not meet this burden.

For example, Petitioners first assert—without support—that Kim discloses a PCB (it does not). Pet. at 34-36. Then. Petitioners assert that a POSITA would replace Kim’s (undisclosed) PCB with the metal PCB of Hong. *Id.* Absent from this discussion, however, is any argument or explanation as to why a POSITA would make the proposed modifications, combine Kim and Hong, or have a reasonable expectation of success in making the combination and modifications. Rather, Petitioners include a catch-all motivation to combine section at the end of the Ground that only sets forth general assertions of predictability and cost savings. *Id.* at 39-40. Petitioners do not include any of this argument or reasoning in their actual claim analysis, thereby failing to particularly identify how the references are purported to be combined or how the proposed combinations allegedly teach each element of the claims.

Moreover, Petitioners do not particularly explain why a POSITA would have combined Kim and Hong or had a reasonable expectation of success in doing so to reach the claimed invention. This omission renders Petitioners’ proposed ground

hopelessly ambiguous as to whether Petitioner intends to rely on the teachings of Hong or whether it relies only on Kim.

2. Grounds 2 and 3 Lack Particularity

For Ground 2, Petitioners contend that claim 5 is obvious over Kim and Hong, as presented in Ground 1, in further view of Tachikawa. Pet. at 43-47. For Ground 3, Petitioners assert claim 8 is obvious over Kim and Hong, as presented in Ground 1, in further view of Takahashi. Pet. at 47-52.

Petitioners' arguments set out for Grounds 2 and 3 lack sufficient particularity to satisfy § 312(a)(3). For example, Petitioners fail to particularly explain why a POSITA would have been motivated to combine Kim and Hong with Tachikawa or Takahashi or have a reasonable expectation of success in doing so. Instead, Petitioners allege a POSITA would have been motivated to combine Kim and Tachikawa (Ground 2, pp. 46-47) and motivated to combine Kim and Takahashi (Ground 3, pp. 50-52), but completely ignores Hong. Nowhere do Petitioners explain why a POSITA would have been motivated to combine Tachikawa or Takahashi with the combination of Kim and Hong or address a POSITA's alleged expectation of success in combining Tachikawa or Takahashi with Kim and Hong, thereby failing to satisfy Petitioners' burden in demonstrating obviousness. *Intelligent Bio-Sys.*, 821 F.3d at 1367–68.

3. Ground 4 Lacks Particularity

For Ground 4, Petitioners contend that claims 1, 2, and 3 are obvious over Kim and Tachikawa. Pet. at 52-55. Petitioners' arguments for Ground 4 lack sufficient particularity to satisfy § 312(a)(3) for at least the following reasons.

First, Petitioners' Ground 4 relies on the analysis from Ground 1 (Kim and Hong) and Ground 2 (Kim, Hong, and Tachikawa), but provides no explanation as to how those grounds, both of which require Hong, can be applied to Ground 4 without Hong. Pet. at 52-55. Nor do Petitioners explain why a POSITA would have had a reasonable expectation of success in achieving the invention in claims 1-3 without Hong.

Second, Petitioners provide no substantive argument or evidence supporting their Ground 4 for claims 1[b], 1[c], 1[d], 2, and 3. Instead, the Petition provides a conclusory statement that the claim or claim element is taught or rendered obvious by the prior art followed by a reference and citation to a previous section of the Petition, ignoring that the previous sections relied on a different combination—Kim and Hong. Petition, 54-55. Petitioners provide no explanation of what prior evidence or argument from these sections Petitioners intend to rely on in support of their conclusory statement. The Board has rejected arguments made in this format:

Some of these sections also contain text explaining Petitioner's argument that the prior art teaches or suggests the limitation in question, along with citations directly to the relevant prior art. Most of these sections, however, do not contain this type of argument, *opting*

instead for conclusory statements that a particular reference or the hypothetical combination of references discloses the limitation in question, referring the reader to earlier portions of the Petition for any relevant argument. This latter type of argument is particularly problematic because it shifts an even greater portion of the burden of deciphering Petitioner's arguments onto Patent Owner and the Board. For these limitations, Petitioner provides no argument at all, requiring Patent Owner or the Board to sift through multiple lengthy sections of the Petition even to determine what argument Petitioner intends to make.

Lenovo (U.S.) Inc. v. LiTL LLC, IPR2021-00681, Paper 8 at 14 (PTAB Sept. 3, 2021) (citations omitted).

Third, for claim 1, Petitioners use imprecise language, making it unclear what, if any, combination of prior art references Petitioners propose be combined. For example, Petitioners argue that “[t]he combination of Kim and Tachikawa discloses every limitation of Claim 1.” Pet. at 52. However, the Petition then only cites to disclosure in Kim, making it unclear whether Petitioners’ proposed ground intends to rely on the teachings of Tachikawa or rely only on Kim.

4. Ground 5 Lacks Particularity

The Petition asserts in Ground 5 that Na renders obvious claims 4, 8, 9, 10, and 16. Pet. at 55-71. Ground 5 fails to satisfy § 312(a)(3) at least because Petitioners use imprecise language, making it unclear what Petitioners contend the prior art teaches. For example, for every claim or claim element, the Petition asserts “Na discloses or renders [claim element/claim] obvious.” Pet. at 55, 57, 60, 63, 64, 66, 68, 69, 70. This language makes it uncertain whether Petitioners assert

Na anticipates any claim element or claim, Na renders obvious any claim element or claim, or both.

To the extent Petitioners' ground is that Na renders obvious each claim element and claim, for all but claim 8, Petitioners provide no analysis of how a POSITA would modify Na to reach the claimed invention or whether a POSITA would have had a reasonable expectation of success. But even then, Petitioners do not present a proper obviousness analysis, entirely failing to address whether a POSITA would have had a reasonable expectation of success in making their proposed modifications to Na. Pet. at 65. Thus, Petitioners fail to satisfy their burden in demonstrating obviousness. *Intelligent Bio-Sys.*, 821 F.3d at 1367–68.

For claim 10, Petitioners provide no substantive argument or evidence supporting their assertion. Instead, Petitioners provide only a conclusory statement that Na discloses or renders obvious claim 10 followed by a citation to a previous section related to claim 8. Pet. at 70. Petitioners provide no explanation of what prior evidence or argument they intend to rely on in support of their conclusory statement, thereby placing the burden on Patent Owner and the Board to decipher Petitioners' arguments. This is improper and insufficient. *See Lenovo*, IPR2021-00681, Paper 8 at 14.

5. Ground 6 Lacks Particularity

For Ground 6, Petitioners contend that claims 7, 12, and 13 are obvious over Na and Kim. Petitioners' arguments set out for Ground 6 lack sufficient particularity to satisfy § 312(a)(3).

For example, Petitioners' Ground 6 relies on the analysis from Ground 1 (Kim and Hong) for claim 7, but provides no explanation as to how that ground, which requires Hong, can be applied to Ground 6 without Hong. Pet. at 71-73. Nor do Petitioners explain why a POSITA would have had a reasonable expectation of success in achieving the invention in claim 7 without Hong.

In addition, Petitioners provide no substantive argument or evidence supporting their Ground 8 for claim 7. Instead, the Petition provides a conclusory statement that the claim is taught or rendered obvious by the prior art followed by a reference and citation to a previous section of the Petition. Petition, 71-72. Petitioners provide no explanation of what prior evidence or argument from this section Petitioners intend to rely on in support of their conclusory statement, thereby placing the burden on Patent Owner and the Board to decipher Petitioners' arguments. *See Lenovo*, IPR2021-00681, Paper 8 at 14.

For claim 12, Petitioners rely on the analysis presented for claim 7. Pet at 74. Thus, for the same reasons, it lacks the requisite particularity.

For claim 13, Petitioners fail to particularly point out why a POSITA would have modified Na based on Kim. A patent challenger holds the “burden to demonstrate both ‘that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.’” *Intelligent Bio-Sys., Inc.* 821 F.3d at 1367–68 (quoting *Kinetic Concepts, Inc. v. Smith & Nephew, Inc.* 688 F.3d 1342, 1360 (Fed. Cir. 2012)). In Ground 6, Petitioners offer no explanation as to why a POSITA would modify Na based on Kim. In fact, Petitioners do not even assert a POSITA would be motivated to combine Na and Kim or address a POSITA’s expectation of success in combining Na and Kim. Pet. at 74-76. This is wholly insufficient to satisfy Petitioners’ burden in demonstrating obviousness. *Intelligent Bio-Sys.*, 821 F.3d at 1367-68.

6. Ground 7 Lacks Particularity

In Ground 7, Petitioners assert claim 11 is obvious over Na in view of Tachikawa. Pet. at 76-78. However, Petitioners rely on their analysis from Ground 2 (Kim, Hong, and Tachikawa), but provide no explanation as to how that analysis can be applied to Ground 7, which does not rely on Kim or Hong. Pet. at 77.

In addition, Petitioners fail to particularly explain why a POSITA would have combined Na and Tachikawa or why a POSITA would have had a reasonable expectation of success. Instead, Petitioners provide conclusory statements such as

“[a] POSITA would have been motivated to combine each of these known approaches with no change in their respective functions, and the combination would yield predictable results.” Pet. at 78. This unsupported statement fails to satisfy Petitioners’ burden in demonstrating obviousness. *Intelligent Bio-Sys.*, 821 F.3d at 1367–68. Petitioners do not explain, for example, why a POSITA would have had a reasonable expectation of success combining any structures from Tachikawa with previous modifications Petitioners have already proposed to Na. Pet. at 77-78. Thus, Petitioners fails to meet their burden in demonstrating obviousness.

7. Ground 8 Lacks Particularity

In Ground 8, the Petition asserts Kimura renders obvious claim 9, 12, 13, and 16. Pet. at 78-89. Ground 8 fails to satisfy § 312(a)(3) at least because Petitioners use imprecise language, making it unclear what Petitioners contend the prior art teaches. For example, for every claim or claim element, the Petition asserts “Kimura discloses or renders [claim element/claim] obvious.” Pet. at 79, 80, 81, 83, 85, 86, 88. This language makes it uncertain whether Petitioners assert Kimura anticipates any claim element or claim, Kimura renders obvious any claim element or claim, or both.

To the extent Petitioners’ ground is that Kimura renders obvious each claim element and claim, for all but claim element 9[b] and claim 13, Petitioners do not

provide any analysis of how a POSITA would modify Kimura to reach the claimed invention. But even then, Petitioners do not present a proper obviousness analysis, entirely failing to address whether a POSITA would have had a reasonable expectation of success in making their proposed modifications to Kimura. Pet. at 83, 87-88. Thus, Petitioners fail to satisfy their burden in demonstrating obviousness. *Intelligent Bio-Sys.*, 821 F.3d at 1367–68.

Moreover, for element 9[b], Petitioners first suggest that Kimura implicitly or inherently discloses the claimed constricted convection plate “covering a majority of the posterior display surface.” Pet. at 81-83. Then, Petitioners assert it “would have been motivated to optimize the display cooling capability by enlarging Kimura’s ‘driving circuit **19**’ to cover the entire rear surface of the display so that ‘the entire backlight is cooled uniformly,’ with a reasonable expectation of success.” *Id.* at 83. Petitioners’ approach completely blurs the lines between the actual teachings of the Kimura reference, Petitioners’ characterizations of those teachings, and Petitioners’ proposed modifications to the teachings, and fails to particularly identify the evidence and argument Petitioners are relying on to support their allegations of unpatentability. *See Apple Inc. v. Contentguard Holdings, Inc.*, IPR2015-00442, Paper 9 at 7 (PTAB July 13, 2015). This approach improperly shifts the burden to Patent Owner and the Board to decipher Petitioners’ arguments. *See id.*; *Lenovo*, IPR2021-00681, Paper 8 at 14.

8. Ground 9 Lacks Particularity

For claims 1[pre], 1[a], 2 and 11, the Petition relies on analysis from Ground 8 (Kimura), but cites only to prior sections of the Petition, providing no explanation of what prior evidence or argument from those sections Petitioners intend to rely on in support of their conclusory statement, thereby placing the burden on Patent Owner and the Board to decipher Petitioners' arguments. Pet. at 94, 95. This is insufficient. *See Lenovo*, IPR2021-00681, Paper 8 at 14.

Moreover, Petitioners do not explain why the POSITA would have been motivated to further implement Kochiyama's teachings in Kimura's system, how the POSITA would implement Kochiyama's teachings into the modified Kimura described in Ground 8, or why the POSITA would expect the combination to be successful. For this additional reason, Ground 9 fails to particularly explain why the claimed invention would have been obvious based on Kimura and Kochiyama.

9. Ground 10 Lacks Particularity

In Ground 10, Petitioners contend that claims 4 and 7 are obvious over Kimura and Hong. Pet. at 96-100. Petitioners' arguments for Ground 10 lack sufficient particularity to satisfy § 312(a)(3) for at least the following reasons.

First, Petitioners' Ground 10 relies on the analysis from Ground 1 (Kim and Hong) but provides no explanation as to how the modifications and expectations from the combination of *Kim* and Hong provides a POSITA a reasonable

expectation of success in combining *Kimura* and Hong to reach the claimed invention. Likewise, the Petitions rely on analysis from Ground 8 (Kimura) but does not explain why the POSITA would have been motivated to further implement Hong's teachings in Kimura's system or why the POSITA would expect the combination to be successful.

Second, Petitioners provide no substantive argument or evidence supporting their Ground 10 for at least claims 4[b], 4[c], 4[d], and 7. Instead, the Petition provides a conclusory statement that the claim or claim element is taught or rendered obvious by the prior art followed by a reference and citation to a previous section of the Petition. Petition, 97-100. Petitioners provide no explanation of what prior evidence or argument from these sections Petitioners intend to rely on in support of their conclusory statement, thereby placing the burden on Patent Owner and the Board to decipher Petitioners' arguments. *See Lenovo*, IPR2021-00681, Paper 8 at 14.

10. Ground 11 Lacks Particularity

For Ground 11, Petitioners contend that claim 5 is obvious over Kimura in view of Hong and Kochiyama. Pet. at 100. Petitioners' argument set out for Ground 11 lacks sufficient particularity to satisfy § 312(a)(3) at least because it relies on analysis from Ground 9 (Kimura and Kochiyama), which did not include Hong, but provides no motivation to combine Kimura with both Kochiyama and

Hong or an explanation as to why a POSITA would have had a reasonable expectation of success combining all three references. Pet. at 100. In fact, Petitioners do not address the combination at all. *Id.*

In addition, Petitioners provide no substantive argument or evidence supporting Ground 11. Instead, the Petition provides a conclusory statement that the claim is taught or rendered obvious by the prior art followed by a reference and citation to a previous section of the Petition. Petition, 100. Petitioners provide no explanation of what prior evidence or argument from this section Petitioners intend to rely on in support of their conclusory statement, thereby placing the burden on Patent Owner and the Board to decipher Petitioners' arguments. *See Lenovo*, IPR2021-00681, Paper 8 at 14.

11. Ground 12 Lacks Particularity

With Ground 12, the Petition asserts Cho renders obvious claims 4, 5, 9, 10, and 11. Pet. at 100-115. Ground 12 fails to satisfy § 312(a)(3) at least because Petitioners use imprecise language, making it unclear what Petitioners contend the prior art teaches. For example, for every claim or claim element, the Petition asserts "Cho discloses or renders [claim element/claim] obvious." Pet. at 101, 102, 104, 106, 108, 109, 110, 111, 113, 114, 115. This language makes it uncertain whether Petitioners assert Cho anticipates any claim element or claim, Cho renders obvious any claim element or claim, or both.

To the extent Petitioners’ ground is that Cho renders obvious each claim element and claim, for all but claim 10, Petitioners do not provide any obviousness analysis. But even then, Petitioners do not present a proper obviousness analysis, entirely failing to address whether a POSITA would have had a reasonable expectation of success in making their proposed modifications to Cho. Pet. at 114-115. Thus, Petitioners fail to satisfy their burden in demonstrating obviousness. *Intelligent Bio-Sys.*, 821 F.3d at 1367–68.

Moreover, in Ground 12, Petitioners do not address—for any claim or claim element—how a POSITA would modify Cho to reach the claimed invention or whether a POSITA would have had a reasonable expectation of success. Thus, Petitioners fail to satisfy their burden in demonstrating obviousness. *Intelligent Bio-Sys.*, 821 F.3d at 1367–68.

C. Kim, Na, Kimura, and Cho Do Not Render the Claims Unpatentable Under Any of Petitioners’ Proposed Grounds

1. Kim Teaches Away from the Claimed Invention

Grounds 1-4 assert claims 1-5, 7, and 8 are obvious based on Kim in combination with various references. However, Kim does not teach all elements of the Challenged Claims, and in fact, teaches away from any modification that would result in the claimed invention.

For example, Kim does not disclose the claimed “constricted convection plate” or “constricted convection channel.” The shield cover 140 Petitioners

identify as being a “constricted convection plate” is related to shielding electromagnetic wave radiation (Ex. 1005 at 4:55-58); it does not create a constricted convection channel. In fact, the shield cover 140 in Kim has “a plurality of air slits 117’ through which flowing air produced by the cooling fan 210 comes in and out.” Ex. 1005 at 4:59-61. This is contrary to the claimed “constricted convection plate” and “side panels” that form a constricted convection channel having a specific entrance and specific exit for directed and consistent air flow.

Moreover, given Kim discloses using a porous shield 140 through which air can flow in and out in various directions for its cooling mechanism, a POSITA would not have been motivated to modify Kim’s system to include the claimed “constricted convection plate” or “constricted convection channel,” which would limit the direction of air flow. Thus, a POSITA would not have been motivated to modify Kim to reach the claimed invention.

Nor would a POSITA have been motivated to modify Kim based on Hong as proposed in the Petition due to the fundamental differences among the references. Hong teaches a display device with “a heat sink located on the device to effectively irradiate heat outside that has accumulated through thermal convection.” *See e.g.*, Ex. 1029 at [0012]. Whereas Hong’s teachings describe heat removal via a heat sink after “heat is accumulated by thermal convection,” Kim not only teaches away

from heat accumulation by convection (*see* Ex. 1005 4:50-51 (describing the “need to dissipate heat quickly”), but also teaches that air from outside “flows through the heat generating parts such as the light source 131 and the circuit board 133 of the backlight unit 130” and then is “discharged to the outside...through the plurality of air slits 117’ of the shield cover . . . so that heat generated from the heat generating parts is emitted” (i.e., heat dissipation by convection). *See e.g., id.* at 7:53-62. Therefore, a POSITA would not use Hong’s thermal convection and heat sink in conjunction with Kim’s porous shield, nor would a POSITA arrive at the claimed constricted convection plate based on these two references.

In addition, Hong teaches the “heat sink may be positioned near the top of the display device to irradiate the heat that rises and accumulates near the top of the device” but that the “driving circuit” that is “configured to operate the liquid crystal panel” should be positioned on “a lower portion of the liquid crystal display device” “a position different from where the heat is accumulated and the heat sink is disposed.” *See* Ex. 1029 at [0012], [0014], [0015]. This is fundamentally different from Kim, which teaches “[t]he light source 131 of the backlight unit 130 is widely arranged on a plane of the backlight unit 130 and generates heat of high temperature when the light source 131 emits light” but then teaches screwing circuit board 133 to the backlight unit 130. *See* Ex. 1005 at 4:41-46; *see also* Ex. 1005 at 2:54-56 (explaining that the “circuit board that is combined to the

backlight unit . . . process an inputted video signal”). In other words, Hong teaches separating the heat generating components, accumulating heat via convection at the top of the display, and removing the heat by conduction via a heat sink, whereas Kim teaches combining the heat generating components together and then removing the heat via uncontrolled airflow through a porous shield cover. Both references teach cooling systems, but the teachings of Kim and Hong are not compatible. Hong and Kim teach away from combination with one another, and both do so in paths “divergent from the path that was taken by the applicant.” *See e.g., Tec Air, Inc. v. Denso Mfg. Michigan Inc.*, 192 F.3d 1353, 1360 (Fed. Cir. 1999).

Further, Hong teaches the use of heat sink 162 “disposed at the upper portion of the standing LCD device where the heat is accumulated by a thermal convection” so that “the heat accumulated at the upper portion of the LCD device in the standing state may be effectively irradiated outside” to “allow the LCD to maintain a thin profile.” Ex. 1029 at [0039]-[0040]. In contrast, Kim teaches the inclusion of layers of electronics and other components behind Kim’s LED backlight, which increases the profile of the device. A POSITA would not have been motivated to combine elements of Hong and Kim because no improved cooling would have been expected but the additional elements would have

increased the thickness of the device, thus decreasing the value of the device while increasing its cost.

2. Na Teaches Away from the Claimed Invention

Grounds 5-7 assert claims 4 and 7-13 are obvious based on Na alone or in combination with various references. However, Na does not teach or render obvious all elements of the Challenged Claims, and in fact, teaches away from any modification that would result in the claimed invention.

For example, Na does not teach the claimed constricted convection plate or constricted convection channel. Nor would it have been obvious to modify Na to include those limitations. Na purports to solve the problem of effectively transferring heat outside of the display by introducing air from outside through through-holes in a bottom plate to a space 260 between the case 200 and the light source device 100. Ex. 1010, p. 5. Then, as the air in the space 260 is heated, it rises in the space by convection and is discharged outside by fans 222a through the same through-holes 212. Ex. 1010, p. 5, Figs. 1-3. In contrast, the claimed invention utilizes a constricted convection channel with a specific entrance and a specific exit to facilitate a flow of outside cooling air into one side of the housing, through one open end of the constricted convection cooling channel that is located behind the posterior surface of the display, and out the opposite end of the constricted convection cooling channel and another side of the housing. *Id.*, FIGS.

5B-5F. Na thus teaches away from the claimed constricted convection channel as it provides a cooling mechanism whereby air enters and exits through the same through-holes in a bottom plate, not a channel having an entrance and an exit. *See e.g.*, Ex. 1010 at Figs. 1-3.

In addition, Na teaches away from the claimed bracket which connects the posterior surface with the constricted convection plate as Na teaches an empty chamber behind the posterior surface with inner space 260 between the posterior surface and the rear porous housing for airflow, meaning Na has no structure corresponding to a constricted convection plate. Thus, a POSITA would not have been motivated to modify the through-holes of Na to form access apertures as Petitioners contend. Na's through-holes are essential to its cooling system; a POSITA would have expected that modifying them to "serve other purposes, such as servicing electrical components and hardware associated with the backlight unit and/or the LCD" would render Na inoperable for its intended purpose and would not have expected to make such a modification with a reasonable expectation of success.

3. Kimura Does Not Teach or Render Obvious a "Constricted Convection Channel"

Grounds 8-11 assert claims 1-5, 7, 9, 11-13, and 16 are obvious based on Kimura alone or in combination with various references. However, Kimura does

not teach or render obvious all elements of the Challenged Claims, and in fact, teaches away from any modification that would result in the claimed invention.

Petitioners point to element 19 for claim 9[a], but element 19 of Kimura is a driving circuit, so Petitioners are incorrect in asserting “no electronics are mounted to the posterior surface of the electronic display” in Kimura as required by 9[a]. Pet. at 80-81. Further, Kimura does not disclose the dimensions of the driving circuit or its positioning such that it would create a “constricted convection channel” as required by 9[b]. Pet. at 81-82.

Moreover, Kimura teaches away from the claimed constricted convection plate and constricted convection channel, so a POSITA would have no motivation to modify Kimura to reach the claimed invention. A POSITA would have understood that driving circuit 19 is a heat generating component and would not have expected that enlarging it would not provide any benefit to the cooling of the display, and, in fact, would have expected enlarging it to decrease the effectiveness of the cooling at an increased cost of the system. Likewise, a POSITA would not have been motivated to modify Kimura to use a plurality of shorter fans instead of a single long fan as Petitioners contend without support. The alleged “optimization” goes against the teachings of Kimura, reduces the wind-producing area for a given length of shaft 23, and introduces cost and complexity to the

system with no cognizable benefit. Thus, Petitioners' grounds relying on Kimura cannot show unpatentability of any Challenged Claim.

4. Cho Does Not Render Obvious the Claimed Invention

Ground 12 asserts Cho renders obvious claims 4, 5, and 9-11. However, Cho does not teach or render obvious certain elements of claim 4. For example, Cho does not disclose the claimed constricted convection plate or that it is "placed behind and substantially parallel with the posterior surface of the PCB" to create the associated claimed convection channel. In contrast, Cho describes bolt-on cooling units affixed to the rear exterior of the device chassis, which is nowhere near a posterior surface of the display and is also exterior to the display housing. Nor does Cho disclose the claimed "fan positioned to draw air between the constricted convection plate and the posterior surface."

In addition, it would not have been obvious to modify Cho as Petitioners propose to reach the claimed invention. For example, a POSITA would not have been motivated to modify Cho's display to use a constricted convection plate that covers the "majority of the posterior display surface" with a reasonable expectation of success. Such a modification would go directly against the teachings of Cho, which teaches the use of multiple small cooling apparatuses 500 for larger displays, destroy the principles behind and efficacy of the cooling apparatuses 500, and would render the cooling apparatuses 500 and Cho's display inoperable for

their intended purposes. Indeed, Cho teaches away from the claimed constricted convection plate and constricted convection channel and instead teaches a shell for a finned heat sink where the purported channel is filled entirely with the heat sink thus substantially reducing the flow of air under the purported constricted convection plate, and the entire cooling apparatus is exterior to the housing of the display.

VI. OTHER CIRCUMSTANCES ALSO WARRANT DENYING INSTITUTION

Finally, the Petition should be denied because it exceeds the word count limit set forth in 37 C.F.R. § 42.24(a)(1)(i). Petitioners certify the word count as 13,779, but the Petition is only under 14,000 words because Petitioners do not follow citation rules. Specifically, citations to paragraphs and sections in the Petition do not include spaces after the symbol, which is improper under conventional citation rules, and a clear tactic to make the Petition fall within the word limit.

Petitioners' word count also ignores that the Petition includes hundreds of annotations in figures. These annotations include text that would not be captured by the word processing software. *See, e.g.,* Pet. at 23 (including 30 words in annotations); 25 (including 31 words in annotations); 38 (including 29 words in annotations); 43 (including 41 words in annotations); 63 (including 30 words in annotations); 104 (including 34 words in annotations).

With proper citations and annotations, the Petition would exceed the 14,000 word limit. For this additional reason, institution should be denied.

VII. CONCLUSION

For the foregoing reasons, institution of the Petition should be denied.

Dated: March 22, 2023

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CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that this Preliminary Response contains 8891 words according to the word-processing program used to prepare this paper. The foregoing word count complies with the 14,000 word type-volume limit specified by 37 C.F.R. § 42.24(b)(1).

Dated: March 22, 2023

Respectfully submitted,

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing Patent Owner's Preliminary Response has been served electronically via email upon the following:

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