

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD. and
SAMSUNG ELECTRONICS AMERICA, INC.,
Petitioner,

v.

POWER2B INC.,
Patent Owner.

IPR2022-00325
Patent 9,946,369 B2

Before BARBARA A. PARVIS, JOHN D. HAMANN, and
JASON W. MELVIN, *Administrative Patent Judges*.

Opinion for the Board filed by PARVIS, *Administrative Patent Judge*.

Opinion dissenting filed by MELVIN, *Administrative Patent Judge*.

PARVIS, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining No Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. (collectively “Petitioner”) filed a Petition (Paper 3 (“Pet.”)) requesting an *inter partes* review of claims 1–17 (“challenged claims”) of U.S. Patent No. 9,946,369 B2 (Ex. 1001, “the ’369 patent”) pursuant to 35 U.S.C. §§ 311–319. Power2B, Inc. (“Patent Owner”) did not file a Preliminary Response. On June 29, 2022, we instituted an *inter partes* review of the challenged claims of the ’369 patent. Paper 7 (“Institution Decision” or “Inst. Dec.”).

Subsequently, Patent Owner filed a Patent Owner Response (Paper 10 (“Resp.”)); Petitioner filed a Reply (Paper 15 (“Reply”)); and Patent Owner filed a Sur-reply (Paper 21 (“Sur-reply”). The oral hearing was held on April 3, 2023. A copy of the hearing transcript has been entered into the record as Paper 34 (“Tr.”). Following the hearing, each party filed an additional paper regarding whether Petitioner presented new or changed positions in its Reply. Papers 32, 33.

We have authority to hear this *inter partes* review under 35 U.S.C. § 6. This Final Written Decision issues pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. We determine that Petitioner has not shown by a preponderance of the evidence that the challenged claims of the ’369 patent are unpatentable.

II. BACKGROUND

A. *Real Parties-in-Interest*

Petitioner identifies as the real parties-in-interest the following: Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. Pet. 2. Patent Owner names itself as the real party-in-interest. Paper 4, 2.

B. Related Matters

Each party identifies a judicial matter that could affect, or be affected by, a decision in this proceeding. In particular, the parties inform us that the '369 patent is asserted in the following district court proceeding: *Power2B, Inc. v. Samsung Electronics Co., Ltd. et al.*, Case No. 2:21-cv-00348 (E.D. Tex.) (“parallel district court proceeding”). Pet. 2; Paper 4, 2.

Petitioner also filed (1) a petition for *inter partes* review of U.S. Patent No. 10,156,931 B2 (IPR2021-01190); (2) a petition for *inter partes* review of U.S. Patent No. 8,610,675 B2 (IPR2021-01220); (3) a petition for *inter partes* review of U.S. Patent No. 8,624,850 B2 (IPR2021-01239); (4) a petition for *inter partes* review of U.S. Patent No. 9,317,170 B2 (IPR2021-01257); (5) a petition for *inter partes* review of U.S. Patent No. 9,569,093 B2 (IPR2021-01266); (6) a petition for *inter partes* review of U.S. Patent No. 7,952,570 B2 (IPR2022-00300); (7) a petition for *inter partes* review of U.S. Patent No. 10,664,070 B2 (IPR2022-00315); (8) a petition for *inter partes* review of U.S. Patent No. 8,816,994 B2 (IPR2022-00334); and (9) a petition for *inter partes* review of U.S. Patent No. 8,547,364 B2 (IPR2022-00405). We instituted an *inter partes* review in each of the aforementioned proceedings. We issued final written decisions in each of IPR2021-01190, IPR2021-01220, IPR2021-01239, IPR2021-01257, IPR2021-01266, IPR2022-00300, and IPR2022-00315.

Petitioner also filed a second petition for *inter partes* review of U.S. Patent No. 8,816,994 B2. We did not institute an *inter partes* review in that proceeding.

C. The '369 patent

The '369 patent relates to computer navigation and an apparatus that facilitates navigation of software stored on the apparatus. Ex. 1001, 1:22–25. Figure 1, below, shows device 10.

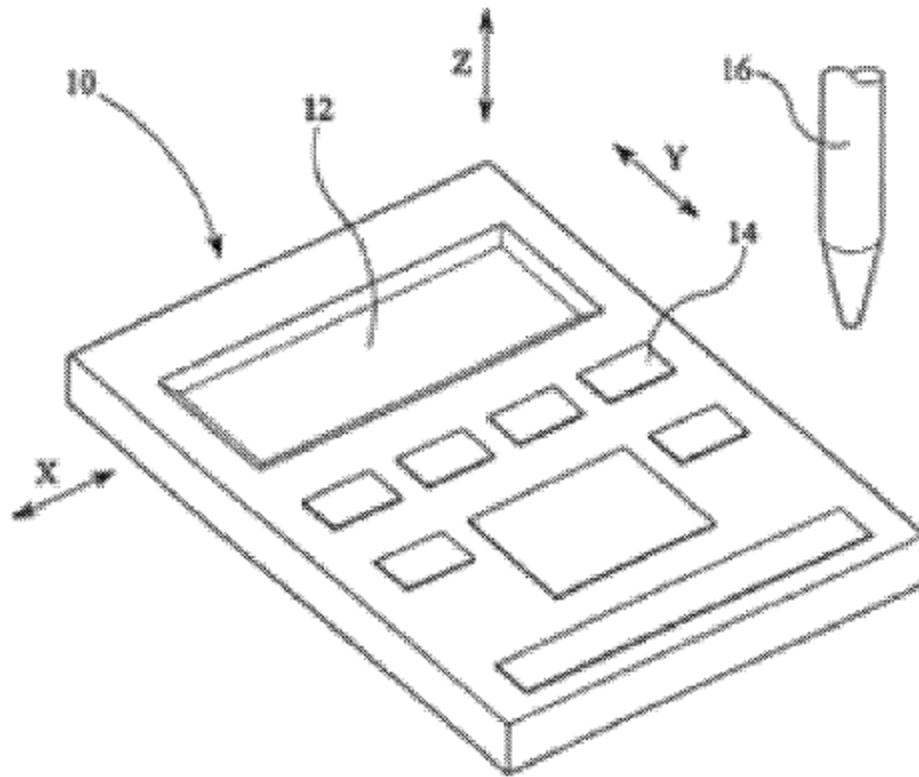


FIG. 1

Figure 1, above, illustrates device 10 having display 12, buttons 14, and stylus 16. *Id.* at 2:58–61, 3:35–41.

Device 10 may be for example, a hand-held computer, a personal digital assistant (PDA), or a mobile communication device such as a mobile telephone. *Id.* at 2:51–54. Device 10 displays data on display 12, which may be a liquid crystal display, a dot matrix display, or a TFT (thin film transistor) display. *Id.* at 2:54–57. Stylus 16 takes the form of a pen-shaped

instrument and allows the user to select various options displayed on display 12. *Id.* at 3:35–41.

Stylus 16 emits a beam of light, such as infrared or other spectrum light. *Id.* at 4:60–62. The light is sensed by a sensitive layer (not shown) that is positioned over or incorporated in display 12. *Id.* at 4:62–64. The light sensitive layer may be in the form of a charge-coupled device (CCD) or a complementary metal-oxide semiconductor (CMOS) infrared sensitive array. *Id.* at 4:64–66. The beam of light emitted by stylus 16 is detected by the sensitive layer. *Id.* at 5:1–2. The sensitive layer determines the X-Y coordinates of stylus 16 and sends a corresponding position signal to the central processing unit of device 10. *Id.* at 5:3–6. The angle of stylus 16 and distance of stylus 16 from display 12 are determined and used to determine the position of stylus 16 in the Z-dimension. *Id.* at 6:17–21.

D. Illustrative Claim

Petitioner challenges claims 1–17 of the '369 patent. Pet. 3. Claims 1 and 11 are the independent claims. Claims 2–10 depend, directly or indirectly, from claim 1. Claims 12–17 depend, directly or indirectly, from claim 11. Independent claim 1, reproduced below, is illustrative of the claimed subject matter.

1. [1[Pre]]¹ An interactive device comprising:

[1[A]] a housing having a screen to display one or more selectable options to a user;

[1[B]] a plurality of light sensors disposed in the housing, each sensor configured to detect a portion of light incident on

¹ Petitioner's designations to reference the elements of claim 1 are set forth in brackets. Pet. 19–33. Herein we refer to the elements of claim 1 using Petitioner's designations.

the device and provide an output signal based on the portion of light detected; and

[1[C]] a processing unit configured to:

[1[D]] receive the output signal from one or more light sensors;

[1[E]] determine, based on the output signal, a position of an object in a three-dimensional (3D) space relative to the interactive device;

[1[F]] determine the position of the object corresponds to one of the selectable options based on a first dimension and a second dimension of the 3D space;

[1[G]] determine, based on a change in the output signal, movement of the object relative to the interactive device in a third dimension of the 3D space; and

[1[H]] execute, based on the movement of the object, a function related to at least one of the one or more selectable options.

Ex. 1001, 8:9–30.

E. Evidence

Petitioner relies on the patent document references summarized in the table below.

Name	Patent Document	Exhibit
Keely	US 6,337,698 B1, issued Jan. 8, 2002	1006
Geva	GB 2 299 856 A, published Oct. 16, 1996	1011
Kameyama	JP H05-265637, published Oct. 15, 1993	1012

Petitioner submits and relies upon the Declaration of Benjamin B. Bederson, Ph.D. (Ex. 1002) and the Reply Declaration of Dr. Bederson (Ex. 1044) in support of its positions. Patent Owner submits and relies upon the Declaration of Darran R. Cairns, Ph.D. (Ex. 2020) in support of its positions.

F. Asserted Grounds

Petitioner asserts that the challenged claims of the '369 patent are unpatentable based on the following grounds.

Claims Challenged	35 U.S.C. §	Reference(s)/Basis
1–9, 11–16	103(a) ²	Keely, Geva
10, 17	103(a)	Keely, Geva, Kameyama

Pet. 3.

III. ANALYSIS

A. Legal Standards

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter 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 in evidence, objective

² The Leahy-Smith America Invents Act, Pub. L. No. 112–29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. § 103, and was effective on March 16, 2013. Petitioner takes no position on the priority date for the claims of the '369 patent and uses the June 9, 2003 date of the earliest provisional patent application, PCT/GB03/02533 as the priority date. Pet. 11–12. On this record, we refer to the pre-AIA version of 35 U.S.C. § 103. Our determinations herein would not change under the AIA version of the statute.

evidence of nonobviousness.³ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

B. Level of Ordinary Skill in the Art

Petitioner asserts that a person of ordinary skill in the art the time of the invention would have had “a bachelor’s degree in electrical engineering, computer engineering, computer science, or a related field, and at least two years of experience in the research, design, development, and/or testing of touch and/or proximity sensors, human-machine interaction and interfaces, and related firmware and software, or the equivalent, with additional education substituting for experience and vice versa.” Pet. 11 (citing Ex. 1002 ¶¶ 22, 37, 40–56).

In the Institution Decision, we stated that we found the phrase “at least” in Petitioner’s proposed definition creates a vague, open-ended upper bound for the level of ordinary skill, and we therefore did not adopt that aspect of the proposal. Inst. Dec. 8. With that exception, considering the subject matter of the ’369 patent, the background technical field, and the asserted prior art, we otherwise agreed with Petitioner’s proposed qualifications for an ordinary level of skill. *Id.*

Patent Owner provides a different level of skill in its Patent Owner Response. Resp. 12. Neither party argues that the disputes in the instant proceeding turn on which level of skill we adopt.

Based on the complete record now before us, we maintain our determination in the Institution Decision (Inst. Dec. 8) that Petitioner’s proposed definition is consistent with the level of skill reflected in the

³ Patent Owner does not present objective evidence of nonobviousness based on the complete record now before us.

specification of the '369 patent and the asserted prior art references. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). Accordingly, we adopt Petitioner's assessment of the level of skill for one of ordinary skill in the art, except without the "at least" phrase. Our analysis and determinations herein, however, do not turn on which level of skill we adopt.

C. Claim Construction

We construe the challenged claims by applying the standard used in federal courts, in other words, "the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. [§] 282(b)," which is articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). 37 C.F.R. § 42.100(b) (2020). Under this standard, the words of a claim generally are given their "ordinary and customary meaning," which is the meaning the term would have to a person of ordinary skill at the time of the invention, in the context of the entire patent including the specification. *Phillips*, 415 F.3d at 1312–13.

Petitioner states "[t]o resolve the particular grounds presented in this Petition, Petitioner does not believe that any term requires explicit construction." Pet. 12. In the Institution Decision, we stated, "[f]or purposes of this decision, we determine we need not construe any claim term." Inst. Dec. 8. In its Patent Owner Response, Patent Owner states "[f]or purposes of this Patent Owner Response, Power2B also does not propose any constructions." Resp. 12.

Based on the complete record now before us, we determine we need not construe any claim term to resolve the disputes in this proceeding. *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) ("The Board is required to construe 'only those terms . . . that are in controversy,

and only to the extent necessary to resolve the controversy.” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

D. Unpatentability of Claims 1–9 and 11–16 under 35 U.S.C. § 103(a) as Obvious over Keely and Geva

Petitioner asserts that claims 1–9 and 11–16 are unpatentable as obvious over Keely and Geva. Pet. 3. We begin with overviews of Keely and Geva. We then turn to Petitioner’s contentions.

1. Keely

Keely is directed to a notepad or notebook computer interface that facilitates input via a pen. Ex. 1006, 1:12–13. User interface elements are provided along a side of the page that allow the behavior of the system to be changed. *Id.* at 1:66–2:2. Figure 1, below, illustrates a display with a display area and tool region. *Id.* at 2:60–61.

FIG. 1

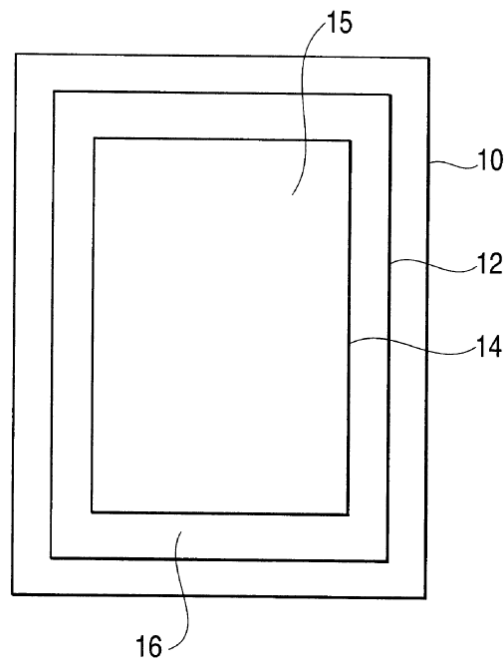


Figure 1, above, illustrates liquid crystal display 10 with display area 12 and tool region 16. *Id.* at 3:53–60, 5:20–23.

Display area 12 has writing surface 15, which is inset to allow for tool region 16. *Id.* Liquid crystal display 10 is included in a pen-based notebook or notepad computer. *Id.* Tools or status indicators are partially or fully displayed in tool region 16 around the edge of writing surface 15. *Id.* at 3:58–60, 5:20–23.

Core task tools use an icon that a user will recognize as related to the task. *Id.* at 5:15–17. Figure 6, below, shows an example.

FIG. 6

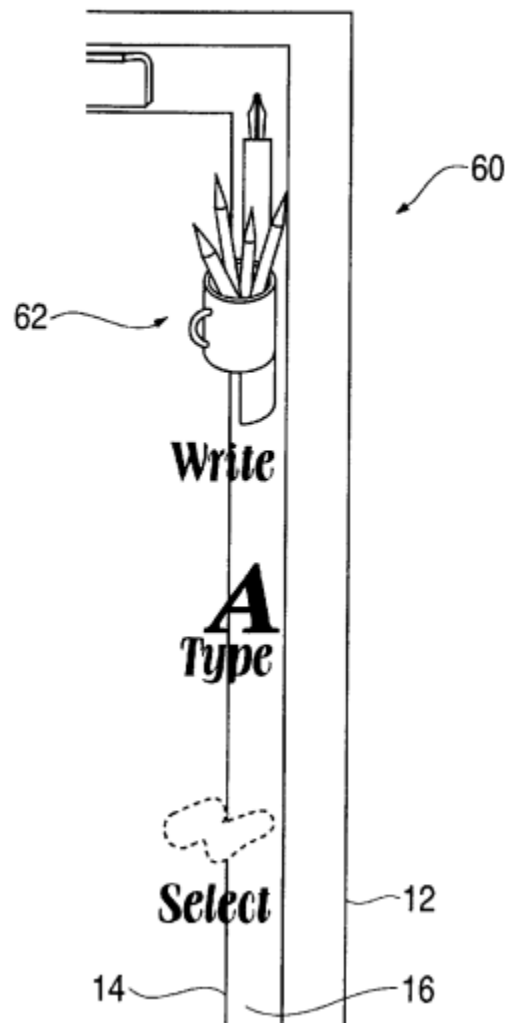


Figure 6, above, illustrates cup 62 of writing instruments fully visible in tool region 16. *Id.* at 5:17–23, Fig. 6.

Cup 62 is an exemplary core task tool and, more specifically, is a writing tool. *Id.* at 5:15–19. The process 100 (shown in Figure 9) of displaying a core task tool involves obtaining the pen location from the digitizer grid control process of the computer and determining whether the pen is within a predetermined threshold distance of or in tool region 16. *Id.* at 6:3–7. The pen may be in the air above the display and not touching the

display. *Id.* at 6:7–9. Figure 6, above, illustrates the display if the pen is up and over the tool. *Id.* at 6:12–14. If the pen is pulled away, the tool fades. *Id.* at 6:17–18.

2. Geva

Geva relates to position-determining input devices, such as digitizing technologies for pen-based computer systems. Ex. 1011, 1:6–9. Figure 6, below, illustrates a position-determining input device. *Id.* at 8.

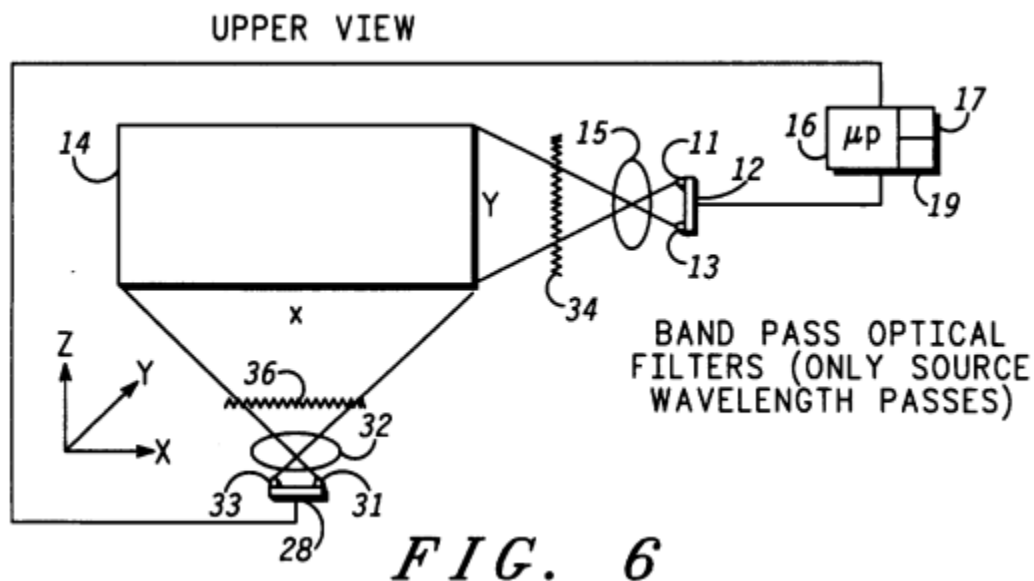


Figure 6, above, is an upper view of a position-determining input device including planar element 14, two light sensor arrays 12 and 28, and processing device 16, among other things. *Id.* at 8:32—9:7.

Light sensor arrays 12 and 28 preferably comprise a multiplicity of light sensing elements and are disposed at first and second edges of the planar element 14. *Id.* As shown in Figure 6, light sensor arrays 12 and 28 each comprise two light sensing elements 11 and 13, and 31 and 33, respectively. *Id.* Light sensor arrays 12 and 28 are coupled to optical lenses 15 and 32, respectively, through band-pass optical filters 34 and 36, which

are arranged to select only the desired light source. *Id.* Light sensor arrays 12 and 28 also are operably coupled to a processing device 16, which comprises intensity/distance computation function 17 and memory element 19. *Id.*

Signals from each light sensing element in light sensor arrays 12 and 28 are transmitted to processing device 16. *Id.* at 9:14–21. Intensity/distance computation function 17 of processing device 16 calculates the position of light emitting cursor device 10 according to the intensity of light incident on first and second light sensor arrays 28 and 30. *Id.* The three-dimensional position of cursor device 10 is calculated. *Id.* at 9:23–10:6.

3. *Independent Claim 1*

The parties' disputes include (1) whether Petitioner's Reply and Dr. Bederson's Reply Declaration improperly introduce new argument and evidence necessary to make out Petitioner's *prima facie* case; (2) whether Petitioner articulates reasoning to combine with rational underpinning; and (3) whether the prior art teaches recitations 1[G] and 1[H]. *See, e.g.*, Resp. 32–37; Sur-reply 1; Paper 32, 1; Paper 33, 1. Patent Owner has the better arguments with respect to each of the three disputes.

In connection with the first of the three disputes, we address the question of whether we should consider certain portions of Petitioner's Reply and Dr. Bederson's Reply Declaration. *See Consolidated Trial Practice Guide ("CTPG")*⁴ at 74–75 (explaining that a "reply or sur-reply that raises a new issue or belatedly presents evidence may not be considered"); *see also* 84 Fed. Reg. 64,280 (Nov. 21, 2019). If Petitioner's Reply and Dr. Bederson's Reply Declaration do not improperly introduce new argument and evidence necessary to make out Petitioner's *prima facie*

⁴ Available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

case, we consider whether Patent Owner waived arguments by not raising them in the response. Paper 8, 9 (“Patent Owner is cautioned that any arguments not raised in the response may be deemed waived.”). For the reasons given herein, even upon consideration of Petitioner’s Reply and Dr. Bederson’s Reply Declaration, Petitioner does not demonstrate unpatentability by a preponderance of the evidence. With respect to whether Patent Owner waived arguments, however, we determine waiver is not appropriate here because, as discussed below, the Petition does not include Petitioner’s newly-raised, improper Reply arguments.

Regarding the second and third disputes, for the reasons given here, we determine that Petitioner has not offered articulated reasoning to combine with sufficient rational underpinning; and Petitioner has not shown that the prior art teaches recitations 1[G] and 1[H].

a) *Do Petitioner’s Reply and Dr. Bederson’s Reply Declaration Improperly Introduce New Argument and Evidence?*

In the Petition, Petitioner argues that claim 1 would have been obvious over the combination of Keely and Geva. *See, e.g.*, Pet. 3. Petitioner argues a person having ordinary skill in the art would have been motivated to combine the teachings of Keely and Geva because Keely and Geva provide “complementary solutions” and a person having ordinary skill in the art “would have understood that these references disclose interrelated teachings that reasonably would have been combined in predictable ways.” *Id.* at 18. Petitioner also provides an element-by-element analysis relying on Keely and Geva. *Id.* at 19–34.

The Patent Owner Response includes arguments that the proposed combination of Keely and Geva is inoperable, that Keely and Geva teach away from each other, and that Petitioner’s motivations to combine lack

evidentiary support. Resp. 13–34. Petitioner responds to the Patent Owner Response by arguing that Patent Owner addresses the “[w]rong [c]ombination of Keely and Geva.” Reply 1. In its Sur-reply, Patent Owner argues Petitioner “attempts to introduce a new Keely-Geva obviousness combination,” which is “unduly prejudicial” to Patent Owner and should be disregarded. Sur-reply 1; *see also id.* at 3 (“The new Keely-Geva combination is impermissible in a reply and unduly prejudicial to Power2B who must now defend against new arguments without the opportunity to submit rebuttal expert testimony.”); Paper 33, 1 (“Petitioner’s new theories remain unsupported by the Petition, raise new issues after PO submitted counter evidence and expert testimony, and should be properly disregarded under the law and Consolidated Trial Practice Guide (‘CTPG’).”). We discuss below whether Petitioner’s Reply and Dr. Bederson’s Reply Declaration improperly introduce new argument and evidence relating to Petitioner’s proposed combination.

The parties’ dispute center’s around each party’s articulation of the proposed combination of Keely and Geva’s teachings raised in the Petition. In particular, Patent Owner argues that Petitioner proposes a modification to Geva’s sensor arrangement “where Keely’s LCD is ‘used as Geva’s planar element.’” *See, e.g.,* Resp. 1. Patent Owner also argues that Petitioner proposes “add[ing] Geva’s linear arrays at the edges of Keely’s LCD,” rather than replacing Keely’s sensors with Geva’s linear sensor array, which results in a “redundant Keely and Geva sensor combination” (referred to herein as the “redundant Keely and Geva sensor combination”). *See, e.g., id.* at 32. Patent Owner also argues that Keely II, a reference incorporated by reference in Keely, “confirms that Keely’s LCD does not have special properties to redirect light to linear sensor arrays disposed at its edges.” *Id.*

at 23 (citing Ex. 1015, 3:49–56, Fig. 1). In its Reply, Petitioner argues that in its proposed combination “Geva’s sensor arrays and planar element would simply be placed on top of Keely’s conventional LCD, with Keely providing the user interface features based on the output of Geva’s input detection system.” Reply 4. Petitioner also argues that it “does not rely on any aspect of Keely II’s alternative digitizer approaches.” *Id.* at 3.⁵ As a result of not relying on “any aspect” of Keely II’s digitizer, Keely’s position determining is replaced with Geva’s position determining such that Petitioner relies on only Geva for determining position. *Id.* at 3–4.

We start by noting that based on our own review of the Petition, we agree with Patent Owner’s arguments, that the Petition relies on Keely’s teachings of determining position in the element-by-element analysis in the Petition. *See, e.g.*, Pet. 19 (describing with respect to element 1[A] that Keely’s “‘notebook’ or ‘notepad’ computer includes all of the components, including the display, processors, memory, sensors, and other components”), 20 (arguing for element 1[B] that “Keely’s notepad computer includes a plurality of sensors disposed in the housing to detect light incident on the device in order to collect the input for ‘interacting’ with electronic documents”), 26 (arguing Keely “determines a three-dimensional position”), 29 (arguing for element 1[F] that “Keely determines the position of the object in the planar horizontal (X-Y) direction of the 3D space”). Keely describes that its position detection is done by hardware disclosed in Keely II, which is incorporated by reference. *See, e.g.*, Ex. 1006, 1:5–9 (describing that “[t]his application is related to U.S. application Ser. No. 09/196114,”

⁵ U.S. Patent 6,756,970 B2 issued June 29, 2004 (Ex. 1015) is referred to as “Keely II” herein.

which is “incorporated by reference”), 3:50–53 (“[t]he present invention is directed to interface elements of a pen based, notepad or notebook computer, the hardware of which is described in detail in the related application previously mentioned”); Ex. 1015, code (21) (“Appl. No.: 09/196,114”). Petitioner does not dispute that Keely incorporates by reference Keely II. *See, e.g.*, Reply 8 n.3 (discussing the “incorporation by reference of Keely II’s disclosures”), 10 n.6 (discussing that Keely “points to another reference, Keely II”).

Keely describes that it “is directed to interface elements of a pen based, notepad or notebook computer, the hardware of which is described in detail in” Keely II. Ex. 1006, 3:50–53. Keely II teaches that “[t]he *digitizer grid 60 and pen controller 72* operate by producing an electromagnetic field which interacts with one or more coils in the pen *from which the pen position, angle, and stylus pressure are determined.*” Ex. 1015, 4:22–26 (emphases added). Arguments in the Petition specifically relating to Keely’s determination of pen position (*see, e.g.*, Pet. 26, 29) support Patent Owner’s contention that the combination in the Petition includes Keely II’s hardware.

We turn to Petitioner’s arguments in its Reply that its Reply combination is not new. First, Petitioner argues that its position is set forth precisely on page 18 of the Petition in a sub-section titled “[a] **POSITA would be motivated to combine the teachings of Keely and Geva.**” Reply 3–4 (quoting Pet. 18). That portion of the Petition is as follows:

Keely in view of Geva (Keely-Geva) teaches all the limitations of Claims 1–9 and 11–16. Both Keely and Geva relate to pen-based computing. Ex-1006, 2:20–23; Ex-1011, Abstract. A POSITA would have known of and consulted each of these proposed solutions. Ex-1002 ¶¶69–70.

Keely and Geva provide complementary solutions to improve pen-based computing by sensing and interacting with a stylus in similar and predictable ways. Ex-1002 ¶70. For example, Keely provides a “pen-based system interface for a notepad computer” that combines “spatial and gestural cues by which it deduces how the input should be processed.” Ex-1006, Title, 3:61–64, 4:14–15. Geva provides a “position determining input device” that determines the X-Y-Z position of the pen from the “intensity of incident light.” Ex-1011, Title, Abstract. Both recognize similar issues and propose solutions using related types of hardware and software. Ex-1002 ¶70. Accordingly, a POSITA would have understood that these references disclose interrelated teachings that reasonably would have been combined in predictable ways. *Id.*

Pet. 18.

Petitioner argues that because it relies on Geva’s “position determining input device,” which includes planar element 14, Petitioner’s proposed combination must include planar element 14. Reply 3–4. In that same discussion on page 18 of the Petition, however, Petitioner also relies on Keely’s “pen-based system interface for a notepad computer” that Petitioner asserts “combines ‘spatial and gestural cues by which it deduces how the input should be processed.’” *Id.* Keely’s “pen-based system interface for a notepad computer” (*id.*) includes Keely’s digitizer. Ex. 1006, 1:5–9, 3:50–53. Also, the “spatial and gestural cues” referred to in the same sentence are processed by Keely’s digitizer. Ex. 1006, 6:3–5. In contrast to Petitioner’s argument, we find that the discussion on page 18 of the Petition describes only how Keely and Geva are similar.

Second, Petitioner argues that in the Petition it relied on Geva’s teaching of using Geva’s technology “as an improved alternative.” Reply 4, 6 (quoting Ex. 1011, 2:19–21). Petitioner does not cite a page of the Petition, but the portion of the Petition that appears most applicable is as follows:

Moreover, it would have been obvious to a POSITA to include Geva's sensor arrays in Keely's "notebook computer" housing to detect a portion of light incident on the device and provide an output signal based on the portion of light detected because the sensor arrays in Geva are configured to detect light incident on the display screen in order to determine the stylus's position. Ex-1002 ¶76. Geva is designed to "work effectively with a liquid crystal display (LCD) screen" as "an improved alternative arrangement for determining the position of digitizer input elements." Ex-1011, 1:16–18, 2:19–21; Ex-1002 ¶76.

A POSITA would have included Geva's sensors in Keely for the added benefits of Geva such as "low power consumption," "immun[ity] to noise," and that it "does not produce radio frequency interference (RFI) noise." Ex-1011, 2:37–39. Based on these teachings a POSITA would have been motivated to use Geva among the existing alternatives. Ex-1002 ¶76. A POSITA would have had a reasonable expectation of success in combining Keely and Geva, because Geva is directed to a "pen-based" LCD display that would be a logical design choice for Keely's notebook computer system that "facilitates input via a pen." Ex-1011, 1:6–9; Ex-1006, 1:12–16; Ex-1002 ¶77.

Pet. 23.

That first paragraph describes including Geva's sensors, without mentioning including Geva's planar element 14 or replacing Keely's digitizer, which is consistent with Patent Owner's argument. Also, consistent with Patent Owner's argument, the first paragraph above includes the statement that "it would have been obvious" to include Geva's sensor arrays "to detect a portion of light *incident on the device*" because Geva's sensor arrays "are configured to detect *light incident on the display screen*." Pet. 23. That statement is consistent with Patent Owner's argument that Petitioner proposes a modification to Geva's sensor arrangement "where Keely's LCD is 'used as Geva's planar element'" (Resp. 1) because it describes detecting light "incident on" the "device" and "display screen." *Id.* In contrast, in

Geva, light emitting cursor device 10 “emits a beam of light on to the planar element 14,” which is “reflected off the planar element 14” and “onto the light sensor array 12.” Ex. 1011, 5:23–25.

The second paragraph describes “including Geva’s sensors in Keely,” without mentioning including Geva’s planar element 14 or replacing Keely’s digitizer. Pet. 23. The next sentence states “a POSITA would have been motivated to use Geva among the existing alternatives,” which provides Petitioner’s reasoning to combine. The Petition lacks the needed specificity set forth in the Reply, i.e., that “combination actually advanced by Petitioner . . . does not rely on any aspect of Keely II’s alternative digitizer approaches” and “Petitioner’s combination is that Geva’s sensor arrays and planar element would simply be placed on top of Keely’s conventional LCD, with Keely providing the user interface features based on the output of Geva’s input detection system.” Reply 3–4.

Third, Petitioner argues in its Reply that Keely “points to” Keely II “as an example prior art input approach that *could* be used, but never says it *must* be used.” Reply 10 n.6. As set forth above, however, Petitioner relies on Keely for teaching determining the pen position and Keely states that its hardware is described in Keely II. Ex. 1006, 3:50–53.

We turn to Petitioner’s post-hearing paper discussing why its arguments in its Reply are not new. Paper 32. In its post-hearing paper, Petitioner argues “[t]he Petition explains a ‘POSITA would have used Geva’s light sensor arrays detecting light from the “light emitting cursor device” ***incident on planar element 14 (outlined in red in Figure 6) to detect light on Keely’s display screen*** in its “notebook computer” (also outlined in red in Figure 1).’” *Id.* at 2 (citing Pet. 22). Consistent with Patent Owner’s argument in its post-hearing brief (Paper 33, 1–2), the statement in

the Petition describes as a result of the proposed combination “light on Keely’s display screen” is detected. Pet. 22. Petitioner does not dispute that Geva teaches that in operation the “beam of light” from light emitting cursor device 10 “is *reflected off* the planar element 14 and along the surface of planar element 14, through the optical lens 15 and onto the light sensor array 12.” Ex. 1011, 5:23–25 (emphasis added). The statement in the Petition regarding “light on Keely’s display screen” is contrary to Petitioner’s proposed combination in its Reply (Reply 3–4) in which light would be reflected off planar element 14 on top of Keely’s display.

Petitioner also argues “[i]n all, Geva’s planar element is discussed 11 times in the Petition grounds.” Paper 32, 3. Consistent with Patent Owner’s argument (Paper 33, 5), upon consideration of all discussion of Geva’s planar element in the Petition, we find that nothing in the Petition indicates that Petitioner’s proposed combination is placing Geva’s planar element on top of Keely’s display. Additionally, and contrary to Petitioner’s position, Keely’s position determining is discussed throughout the Petition, as set forth above, and that position determining is performed by Keely II’s hardware.

Petitioner’s post-hearing paper discussing why the arguments in its Reply are not new (Paper 32) does not meaningfully address whether replacing Keely II’s hardware is a new argument. More specifically, Petitioner does not address in Paper 32 Patent Owner’s arguments that the combination in the Petition is “add[ing] Geva’s linear arrays at the edges of Keely’s LCD,” rather than replacing Keely’s sensors with Geva’s linear sensor array, which results in a “redundant Keely and Geva sensor combination” (*see, e.g.*, Resp. 32) and that Petitioner’s elimination of Keely’s digitizer is a new argument (Sur-reply 4, 15).

During the hearing and in its subsequent paper, Petitioner argues that Patent Owner could have deposed Dr. Bederson to attempt to gain clarification regarding Petitioner’s proposed combination. *See, e.g.*, Paper 32, 1, 6; Tr. 15:21–23, 15:25–16:3. As Petitioner acknowledges (Tr. 18:2–6), Petitioner was required to advance its proposed combination in the Petition.

We recognize that a petitioner may set forth alternative positions as to how the prior art teaches the elements of the claims. *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1373 (Fed. Cir. 2019) (“As both the Board and Realtime recognized, HP also argued in the alternative that Nelson disclosed some of the elements in the claims at issue.”). That, however, is not Petitioner’s approach in the instant proceeding. Indeed, Petitioner acknowledges that it did not set forth alternative positions, arguing that the Patent Owner Response addresses the “[w]rong [c]ombination of Keely and Geva.” Reply 1.

Importantly, to prevail in its challenge to Patent Owner’s claims, Petitioner must demonstrate that the claims are unpatentable, and that burden never shifts to the patentee. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). “In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (2012)); *see also Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016) (“It is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify ‘with particularity’ the ‘evidence that supports the grounds for the challenge to each claim.’” (quoting 35 U.S.C. § 312(a)(3))).

Based on the complete record now before us, we find that the Petition includes argument and evidence indicating clear reliance on Keely's teachings of determining pen position, consistent with Patent Owner's contentions. We further find that the Petition does not include Petitioner's Reply arguments regarding Geva's planar element. We conclude that the Petition does not set forth Petitioner's proposed combination of Keely and Geva argued in the Reply and, therefore, the Reply includes improper, new argument. With respect to Patent Owner's argument that Petitioner's Reply and Reply declaration should be disregarded (Sur-reply 3; Paper 33, 1), we need not reach that decision because, as discussed below (*see* §§ III.D.3.b–c) even upon consideration of Petitioner's new Reply arguments, Petitioner does not demonstrate that claim 1 is unpatentable.

To the extent Patent Owner has not fully explained its opposition to the Petition in its Patent Owner Response, Petitioner must demonstrate that the claims are unpatentable, and that burden never shifts to the patentee. *Dynamic Drinkware*, 800 F.3d at 1378. We had cautioned Patent Owner that arguments not raised in its Patent Owner Response “may be deemed waived.” Paper 8, 9. We determine that any such waiver is not appropriate here because the Petition does not include Petitioner's newly raised, improper Reply arguments.

We further note that Petitioner's Reply and Dr. Bederson's Reply Declaration include additional, improper new argument and evidence not discussed above. We discuss certain of those new arguments and evidence below.

b) Does Petitioner Offer Articulated Reasoning to Combine with a Rational Underpinning?

We turn to the question of whether Petitioner offered articulated reasoning to combine with a rational underpinning. We consider the question with respect to Petitioner's proposed combination in its Reply in which Keely's sensors are replaced with Geva's sensors resulting in a device with only Geva's sensors and including Geva's planar element. Reply 3–4. For completeness and to address certain arguments made with respect to element 1[G], we also consider the question with respect to a hybrid of the redundant Keely and Geva sensor combination (Resp. 32), which also includes Geva's planar element (Reply 4).

We consider whether a person having ordinary skill in the art would have had “an apparent reason to combine the known elements *in the fashion claimed by the patent at issue.*” *KSR*, 550 U.S. at 418 (emphasis added). Obviousness requires that a person of ordinary skill at the time of the invention “would have selected and combined [the] prior art elements in the normal course of research and development *to yield the claimed invention.*” *Unigene Labs., Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1360 (Fed. Cir. 2011) (emphasis added); *see also Orexo AB v. Actavis Elizabeth LLC*, 903 F.3d 1265, 1273 (Fed. Cir. 2018) (“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.”). For the reasons given, we are not persuaded that Petitioner has offered articulated reasoning with a rational underpinning as to why one of ordinary skill in the art would have combined the teachings of Keely and Geva in the manner recited in claim 1.

We start with a sub-section in the Petition titled “A POSITA would be motivated to combine the teachings of Keely and Geva.” Pet. 18. That portion of the Petition is as follows:

Keely in view of Geva (Keely-Geva) teaches all the limitations of Claims 1–9 and 11–16. Both Keely and Geva relate to pen-based computing. Ex-1006, 2:20–23; Ex-1011, Abstract. A POSITA would have known of and consulted each of these proposed solutions. Ex-1002 ¶¶69–70.

Keely and Geva provide complementary solutions to improve pen-based computing by sensing and interacting with a stylus in similar and predictable ways. Ex-1002 ¶70. For example, Keely provides a “pen-based system interface for a notepad computer” that combines “spatial and gestural cues by which it deduces how the input should be processed.” Ex-1006, Title, 3:61–64, 4:14–15. Geva provides a “position determining input device” that determines the X-Y-Z position of the pen from the “intensity of incident light.” Ex-1011, Title, Abstract. Both recognize similar issues and propose solutions using related types of hardware and software. Ex-1002 ¶70. Accordingly, a POSITA would have understood that these references disclose interrelated teachings that reasonably would have been combined in predictable ways. *Id.*

Pet. 18.

We find that the discussion on page 18 of the Petition describes how Keely and Geva are similar. Petitioner’s contentions pointing to similarities in Keely and Geva do not suffice as an articulated reason with rational underpinning to combine their respective teachings—more is required to support the legal conclusion of obviousness. *See KSR*, 550 U.S. at 418. The Federal Circuit has concluded that merely asserting that references were drawn from the same field of art is “simply too conclusory” to show that the skilled artisan would have combined these references in the way of the claimed invention. *Securus Techs., Inc. v. Glob. Tel*Link Corp.*, 701 F. App’x 971, 976 (Fed. Cir. 2017); *see Microsoft Corp. v. Enfish, LLC*, 662 F.

App’x 981, 990 (Fed. Cir. 2016) (determining that “the Board correctly concluded” that a petitioner “did not articulate a sufficient motivation to combine” where the only reason given was “that references were directed to the same art or same techniques”). In the same way, Petitioner’s contentions here that the references are similar do not show why the ordinarily-skilled artisan would have combined Keely and Geva. Furthermore, we find that the sentence “[a]ccordingly, a POSITA would have understood that these references disclose interrelated teachings that reasonably would have been combined in predictable ways” (Pet. 18) is conclusory. Dr. Bederson’s testimony cited above does not add to the argument or evidence presented in the Petition. We, therefore, find that Petitioner’s discussion on page 18 of the Petition does not offer articulated reasoning to combine with a rational underpinning.

We turn to Petitioner’s argument as follows:

A POSITA would have used Geva’s light sensor arrays detecting light from the “light emitting cursor device” incident on planar element 14 (outlined in red in Figure 6) to detect light on Keely’s display screen in its “notebook computer” (also outlined in red in Figure 1) because doing so would be a simple design choice in order to collect the positional input for “interacting” with electronic documents. Ex-1002 ¶75.

Moreover, it would have been obvious to a POSITA to include Geva’s sensor arrays in Keely’s “notebook computer” housing to detect a portion of light incident on the device and provide an output signal based on the portion of light detected because the sensor arrays in Geva are configured to detect light incident on the display screen in order to determine the stylus’s position. Ex-1002 ¶76. Geva is designed to “work effectively with a liquid crystal display (LCD) screen” as “an improved alternative arrangement for determining the position of digitizer input elements.” Ex-1011, 1:16–18, 2:19–21; Ex-1002 ¶76.

A POSITA would have included Geva's sensors in Keely for the added benefits of Geva such as "low power consumption," "immun[ity] to noise," and that it "does not produce radio frequency interference (RFI) noise." Ex-1011, 2:37–39. Based on these teachings a POSITA would have been motivated to use Geva among the existing alternatives. Ex-1002 ¶76. A POSITA would have had a reasonable expectation of success in combining Keely and Geva, because Geva is directed to a "pen-based" LCD display that would be a logical design choice for Keely's notebook computer system that "facilitates input via a pen." Ex-1011, 1:6–9; Ex-1006, 1:12–16; Ex-1002 ¶77.

Pet. 22–23. Dr. Bederson's testimony cited above is substantially the same as Petitioner's arguments.

Regarding the first paragraph and Petitioner's argument that the proposed combination would have been "a simple design choice," we find that Petitioner's argument is conclusory. Petitioner, for example, does not set forth design choices other than Geva or provide explanatory evidence supporting that a person having ordinary skill in the art would have used Geva's design as a "simple" choice among various alternatives. To the extent that Petitioner is relying solely on Geva's teachings regarding alternatives as setting forth the various design choices, Petitioner's argument is contrary to its other arguments and Geva's teachings that discuss, for example, advantages and disadvantages of the various alternatives.

Regarding the second and third paragraphs, Petitioner relies on Geva's "Background of the Invention" (Pet. 23 (citing Ex. 1011, 1:12–18, 2:19–21)), in which Geva describes that "[t]here different digitizing technologies currently exist for determining the position of the pen in pen-based systems," which are "resistive, electrostatic, and electromagnetic." Ex. 1011, 1:13–15. Geva describes that digitizing technology "should accurately

simulate the sense of *pen and paper*.” *Id.* at 1:15–17 (emphasis added). We find that Geva’s description is consistent with Patent Owner’s characterization of Geva as pertaining to two-dimensional position determination. *See, e.g.*, Resp. 19–20 (arguing that Geva describes determining “an x-y coordinate for the stylus”); *see also* Sur-reply 18–19 (describing Geva’s position detection as “rudimentary”). Indeed, Geva describes “calculating,” not detecting “the position” in a “third, ‘z’ dimension” as “an optional feature.” Ex. 1011, 9:13–26.

Petitioner relies on “the added benefits of Geva.” Pet. 23 (citing Ex. 1011, 2:37–39). Geva’s disclosure in that regard is a sentence stating “[a]dvantageously, the position-determining input device is light, has low power consumption, is immune to noise and does not produce radio frequency interference (RFI) noise.” Ex. 1011, 2:37–39. Geva describes multiple embodiments and specifically describes that determining “the position of the light emitting cursor device 10 in a third, ‘z’ dimension” is “an optional feature.” Ex. 1011, 9:23–26. Geva does not expressly state that the advantages apply to all embodiments. *See generally* Ex. 1011. Also, Geva does not specifically mention Keely or Keely II. *See generally* Ex. 1011.

Regarding Geva’s stated advantage that its position-determining input device is immune to noise and does not produce RFI noise (Ex. 1011, 2:37–39), Geva teaches that the electromagnetic digitizer “requires a magnetic shield to be placed between the sensor board and the system motherboard.” Ex. 1011, 2:13–18. Geva does not describe any disadvantage with noise other than it requires a shield. Keely II describes that its hardware includes a shield “to isolate the digitizer grid from electromagnetic field disturbances cause by the row and column driver circuits.” Ex. 1015, 3:32–34. As will be

discussed below, Petitioner has not shown that a person having ordinary skill in the art would have weighed the need for a shield as a significant disadvantage given disadvantages associated with modifying Keely to replace its digitizer with Geva's technology.

In particular, regarding disadvantages associated with replacing Keely's digitizer with Geva's technology, relying on the testimony of Dr. Cairns, Patent Owner argues the following:

Samsung's remaining references to Geva and the alleged motivation fail to appreciate that at the time of the invention, a POSITA would not have attempted to modify Keely to determine the object's 3D position/coordinate or any movement based on the same. Then-existing electronic devices such as Keely's notepad computer would have had to expend valuable processing cycles to attempting to calculate an object's 3D coordinate position, resulting in degraded and slower performance. *See* Ex-2020, ¶99. Dr. Cairns explains that then-available processors for devices such as Keely's would have needed to expend significant processing resources to try to calculate an object's 3D position coordinate and movements based on the same, which would not have provided any benefit to Keely's 2D position determination.

Further, a POSITA would have understood that Keely's broader teachings specifically limits its proximity/threshold detection to preserve processing power and optimize battery life. Thus, the proposed Keely-Geva combination does not disclose or suggest the claimed operations for determining the object's 3D position or movements based on the same. *See* Ex-2020, ¶100.

Resp. 37.

In its Reply, Petitioner provides only minimal, non-persuasive response. Petitioner argues "the '369 Patent assumes such ranges can be calculated without suggesting that processing resources are an issue." Reply 15. We consider statements regarding the knowledge of one of ordinary skill in the art. *See* Memorandum from Katherine K. Vidal to Members of the

Patent Trial and Appeal Board (June 9, 2022), *available at* <https://www.uspto.gov/sites/default/files/documents/20220609updatedAAPAmemo.pdf> (“AAPA Guidance”) at 4 (“Admissions may include statements in the specification of the challenged patent such as ‘It is well known that ...,’ ‘It is well understood that ...,’ or ‘One of skill in the art would readily understand that ...,’ or may describe technology as ‘prior art,’ ‘conventional,’ or ‘well-known.’ *See McCoy v. Heal Sys., LLC*, 850 F. App’x 785, 789 (Fed. Cir. 2021) (non-precedential).” Petitioner provides no citation to the ’369 patent. Upon consideration of the ’369 patent, we do not discern any such statements or description in the ’369 patent indicating an admission. Instead, we discern explicit disclosure in the “Detailed Description of Example Embodiments” of the operation of the embodiments of the invention to determine X-Y-Z coordinates with specific mention of movement of the stylus. *See, e.g.*, Ex. 1001, 4:51–6:61. The ’369 patent, for example, explains “[r]epetitive calculation of the stylus position, several times a second, as the stylus 16 is moved” allows recording of “a stylus trajectory,” which “may then be used to assist in anticipating the intentions of the user.” *Id.* at 6:22–25. We are not persuaded by Petitioner’s argument because it is contrary to the principle that an inventor’s own work may not be considered prior art in the absence of a statutory basis. *Riverwood Intern. Corp. v. R.A. Jones & Co., Inc.*, 324 F.3d 1346, 1355 (Fed. Cir. 2003).

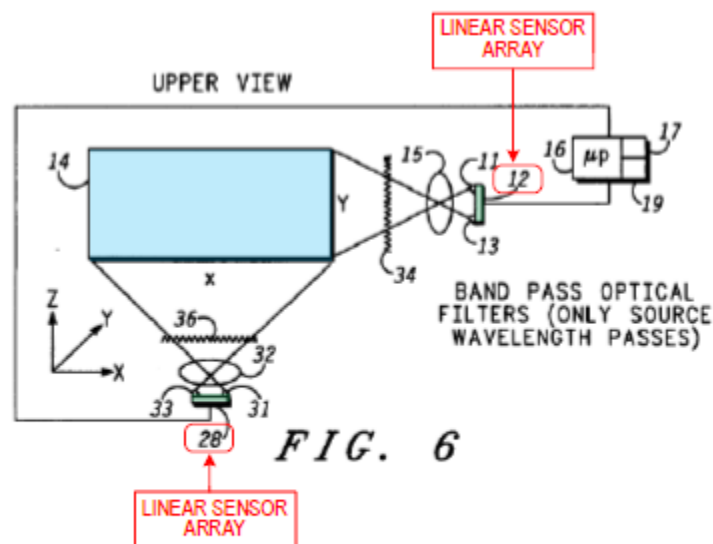
Patent Owner argues that Petitioner’s arguments “directed to the ’369 patent demonstrate improper hindsight.” Sur-reply (citing Reply, 8, 15, 25). When resolving an obviousness issue, “[c]are must be taken to avoid hindsight reconstruction by using ‘the patent in suit as a guide through the maze of prior art references, combining the right references in the right way

so as to achieve the result of the claims in suit.’” *See Grain Processing Corp. v. Am.-Maize Prods. Co.*, 840 F.2d 902, 907 (Fed. Cir. 1988) (quoting *Orthopedic Equip. Co. v. United States*, 702 F.2d 1005, 1012 (Fed. Cir. 1983)). We decline to weigh the ’369 patent disclosures as evidence supporting Petitioner’s position as urged by Petitioner in response to Patent Owner’s arguments regarding deficiencies in Petitioner’s reasoning to combine. Reply 15 (citing Resp. 37); *see also* Resp. 37 (disputing Petitioner’s “references to Geva and the alleged motivation”).

In its Reply, Petitioner also argues that Dr. Cairns did not “consider” Geva’s teachings relied on by Petitioner, including Geva’s Figure 6. Reply 1, 2, 15–16 (citing Ex. 1042, 152:16–153:3); *see also* Tr. 25:21–23 (“I’m not sure that Patent Owner has actually disputed that the Geva input mechanism would be combined with Keely the way we suggest.”), 31:18–19 (“Patent Owner does not actually provide any testimony about Geva”), 35:2–3 (“there’s nothing else I want to add on top of what Ms. Zervos said”). We disagree with Petitioner and find that Petitioner takes Dr. Cairns deposition testimony (Ex. 1042, 152:16–153:3) out of context. Dr. Cairns testifies regarding his opinions in his Declaration relating to the combination of Keely and Geva. *See, e.g., id.* at 143:23–25 (testifying “Geva can be used on an LCD, as described in Geva”), 146:7–13 (testifying “I expressed opinions about inoperability”), 150:23–151:3 (testifying “Well, [Geva] says that this invention seeks to provide an improved alternative arrangement for determining the position of digitizer input elements, such as computer pens. So, I think it’s fair to say that that’s - - that’s what it seeks to do.”). During the deposition of Dr. Cairns, counsel for Petitioner states “I think that’s consistent with *my understanding of the opinions that you expressed for what you called the Keely/Geva combination.*” *Id.* at 146:15–18. This

statement by Petitioner’s counsel is not a question and appears to pertain to Petitioner’s argument in its Reply that Patent Owner’s argument is directed to the wrong combination. *Id.* Petitioner’s Reply, however, was filed January 27, 2023, which is just over one month after December 15, 2022, which is the date of the deposition of Dr. Cairns. Considered in its entirety, we find that Dr. Cairns deposition testimony is contrary to Petitioner’s argument that Dr. Cairns did not consider Geva.

Also, contrary to Petitioner’s argument, Dr. Cairns describes Figure 6 of Geva in his Declaration. *See, e.g.*, Ex. 2020 ¶ 57 (testifying “I further understand that Geva’s ‘improved alternative arrangement’ includes linear sensor arrays ‘dispose at the edge’ of the planar element” and citing “Ex-1011, 2:19-21, 2:25-29, 3:1-4, Figs. 1 and 6”). Indeed, Dr. Cairns Declaration includes a reproduction of Figure 6 of Geva with Dr. Cairns’s annotations. *Id.* ¶ 59.



Ex-1011, Fig. 6 (annotated).

Figure 6 of Geva, above, with Dr. Cairns’s red box with the red text “LINEAR SENSOR ARRAY” pointing to each of light sensor arrays 12 and

28. *Id.* Petitioner has not disputed Dr. Cairns’s testimony regarding Figure 6 of Geva. *See, e.g.*, Reply 2 (referring to “the planar element” of Geva as “a key element”).

Petitioner also argues that Patent Owner’s argument is “[w]ithout explanation.” *Id.* at 18. We find that Patent Owner provides explanation and the supporting testimony of Dr. Cairns. *See, e.g.*, Resp. 37 (citing Ex. 2020 ¶¶ 99–100). Keely II describes that “[o]ther portable, pen-based input devices do not function as computers but rather as limited input devices” (Ex. 1015, 1:26–27), which is consistent with Patent Owner’s position. Furthermore, as discussed above, to prevail in its challenge to Patent Owner’s claims, Petitioner must demonstrate that the claims are unpatentable, and that burden never shifts to the patentee. *Dynamic Drinkware*, 800 F.3d at 1378.

Relying on the testimony of Dr. Cairns, Patent Owner also argues that a person having ordinary skill in the art would not have made the proposed combination because “Geva teaches a device that requires linear sensor arrays and corresponding circuitry/components (e.g., a lens) disposed at edges of its planar element, which would increase the ‘border width’ and reduce the overall display area to accommodate Geva’s sensor arrays and corresponding circuitry.” Resp. 29 (citing Ex. 1011, 2:19–21, 2:25–29, 3:1–4, Figs. 1, 6; Ex. 2020 ¶ 78). Consistent with Patent Owner’s argument and Dr. Cairns’s testimony (Resp. 29; Ex. 2020 ¶ 78), Keely II describes “[w]hat is needed is a system that maximizes the input field size relative to the extent of the top surface of the notepad device.” Ex. 1015, 1:35–37. Geva illustrates that its sensor arrays 12 and 28 are disposed at an edge of planar element 14. *See, e.g.*, Ex. 1011, Fig. 6; *see also id.* at 3:1–4 (describing

“wherein the at least two light sensing elements are disposed at the first edge of the planar element”).

Importantly, element 1[G] recites “determine, based on a change in the output signal, *movement* of the object relative to the interactive device in *a third dimension* of the 3D space” (emphasis added). Element 1[H] recites “execute, based on the movement of the object, a function related to at least one of the one or more selectable options.” Thus, as recited in element 1[H], execution is based on “the movement,” which derives antecedent basis from element 1[G]. Petitioner’s arguments regarding reasoning to combine do not offer articulated reasoning with rational underpinning as to why a person having ordinary skill in the art would have combined the teachings of Keely and Geva in the manner claimed as element 1[G] requires a determination regarding “movement” that is “in a third dimension” and the execution recited in element 1[H] is based on that movement. As discussed below, Geva teaches determining a position. *See infra* § III.D.3.c. Even if we were to accept Petitioner’s argument that the sentence in Geva regarding its advantages (Ex. 1011, 2:37–39) supports replacing Keely’s position determining with Geva’s position determining, that does not result in a combination that teaches all recitations in claim 1 and Petitioner does not provide reasoning to make further modifications. Petitioner does not provide articulated reasoning to combine in the manner recited in claim 1, which includes elements 1[G] and 1[H].

Petitioner does not address or respond to evidence in the record that a person having ordinary skill in the art would not have made Petitioner’s proposed combination. Petitioner also does not address the benefits

described in Keely II of its hardware or the testimony of Dr. Cairns.⁶ Based on the complete record now before us, Petitioner does not provide articulated reasoning to combine in the manner recited in claim 1 using Petitioner’s proposed combination on pages 3–4 of its Reply.

For completeness, Petitioner’s argument and evidence also does not provide articulated reasoning to combine with a rational underpinning using the redundant Keely and Geva sensor combination with Geva’s planar element. We find that Geva’s description of its advantages does not pertain to combining Keely’s sensors with Geva’s sensors with the result being redundant Keely and Geva sensors. Ex. 1011, 2:19–21 (describing that its “invention seeks to provide an improved *alternative* arrangement for determining the position of digitizer input elements such as computer pens” (emphasis added)), 2:37–39 (describing advantages that would not be achieved with redundant, duplicative sensors including “low power consumption,” “immun[ity] to noise,” and no production of “radio frequency interference (RFI) noise”). Other deficiencies discussed above also apply.

Petitioner also provides reasoning to use Keely’s processing unit for communication with the sensor array. *See, e.g.*, Pet. 24–25. Those arguments do not offer articulated reasoning as to why a person having ordinary skill in the art would have modified Keely’s position determining.

Petitioner also argues the following:

⁶ Patent Owner’s arguments in its Sur-reply provide additional, persuasive reasons why Petitioner’s showing is deficient even using Petitioner’s proposed combination on pages 3–4 of its Reply. *See, e.g.*, Sur-reply 15–20. Although Patent Owner’s argument and evidence are persuasive, Patent Owner’s Sur-reply arguments or evidence are not needed for our determinations here.

Keely provides icons representative of various “tools” when the computer “determine[es] 104 whether the pen is within a predetermined threshold distance of or in the region 16. Note that this includes the pen being in the air above the display and not touching the display.” Ex-1006, 6:3–9. A POSITA would have understood that Keely thus determines a three-dimensional position, but leaves the implementation details to a POSITA. Ex-1002 ¶82.

Pet. 26.

To the extent Petitioner’s argument is that Petitioner can rely on Keely’s teachings of position determining without relying on Keely II’s digitizer, we disagree. Based on the complete record now before us, we find that the characterization of Keely in the Petition and in Dr. Bederson’s testimony (Pet. 26; Ex. 1002 ¶ 82) is inconsistent with Keely’s teachings. Instead of describing position detection as “implementation details,” Keely teaches that its position detection is done by hardware disclosed in Keely II, which is incorporated by reference. *See, e.g.*, Ex. 1006, 1:5–9 (describing that “[t]his application is related to U.S. application Ser. No. 09/196114,” which is “incorporated by reference”), 3:50–53 (“[t]he present invention is directed to interface elements of a pen based, notepad or notebook computer, the hardware of which is described in detail in the related application previously mentioned”), 6:3–5 (describing that Keely’s user interface obtains “the pen location from the digitizer grid”); Ex. 1015, code (21) (“Appl. No.: 09/196,114”). Petitioner does not dispute that Keely incorporates by reference Keely II. *See, e.g.*, Reply 8 n.3 (discussing the “incorporation by reference of Keely II’s disclosures”), 10 n.6 (discussing that Keely “points to another reference, Keely II”). Keely II teaches that “[t]he *digitizer grid 60 and pen controller 72* operate by producing an electromagnetic field which interacts with one or more coils in the pen *from*

which the pen position, angle, and stylus pressure are determined.” Ex. 1015, 4:22–26 (emphases added).

Petitioner also argues a person having ordinary skill in the art “would have been motivated to include determining the three-dimensional position of the stylus relative to the interactive device based on the light detected, as taught by Geva, into Keely’s notepad computer because Keely considers the pen’s three-dimensional position in displaying tool options and selection.” Pet. 27 (citing Ex. 1002 ¶ 85). Dr. Bederson’s testimony cited in the Petition is the same as Petitioner’s argument. That Keely already considers the pen’s three-dimensional position is not a reason to modify Keely. We find that Petitioner’s argument in this regard does not remedy the aforementioned deficiencies in Petitioner’s arguments.

In summary, we have considered whether Petitioner has offered articulated reasoning with a rational underpinning with respect to Petitioner’s proposed combination in its Reply in which Keely’s sensors are replaced with Geva’s sensors resulting in a device with only Geva’s sensors and including Geva’s planar element. Reply 3–4. For completeness and to address certain arguments made with respect to element 1[G], we also considered the question with respect to a hybrid of the redundant Keely and Geva sensor combination (Resp. 32), which also includes Geva’s planar element (Reply 4), contrary to Patent Owner’s argument. For the reasons given, with respect to both the aforementioned proposed combinations, we determine that Petitioner has not offered articulated reasoning with a rational underpinning as to why one of ordinary skill in the art would have combined the teachings of Keely and Geva in the manner recited in claim 1. Accordingly, we conclude that Petitioner has not demonstrated by a

preponderance of the evidence that claim 1 is unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Keely and Geva.

c) *Has Petitioner Shown that its Combination on Pages 3–4 of its Reply Teaches Elements 1[G] and 1[H]?*

As a separate, independent reason for our conclusion herein, we turn to the combination Petitioner argues in its Reply, i.e., that “Geva’s sensor arrays and planar element would simply be placed on top of Keely’s conventional LCD, with Keely providing the user interface features based on the output of Geva’s input detection system.” Reply 4. Also, Petitioner’s combination on pages 3–4 of its Reply does not include “any aspect of Keely II’s alternative digitizer approaches.” Reply 3–4.

Claim 1 includes the following recitations:

- 1[G] determine, based on a change in the output signal, movement of the object relative to the interactive device in a third dimension of the 3D space; and
- 1[H] execute, based on the movement of the object, a function related to at least one of the one or more selectable options.

Ex. 1001, 8:25–30.

Patent Owner argues that element 1[G] was amended during prosecution to overcome a prior art rejection. Resp. 9. In particular, Patent Owner argues that the emphasized language was added “determine, based on a change in the output signal, movement of the object relative to the *interactive device in a third dimension of the 3D space.*” *Id.* (emphasis added). Patent Owner’s argument will be discussed below.

Based on the complete record now before us, we determine Petitioner has not shown that Petitioner’s combination on pages 3–4 of its Reply teaches recitations 1[G] and 1[H] in independent claim 1.

(1) *Element 1[G]: “determine, based on a change in the output signal, movement of the object relative to the interactive device in a third dimension of the 3D space”*

For element 1[G], Petitioner asserts in the Petition that the combination of Keely and Geva teaches element 1[G] and cites as supporting evidence the testimony of Dr. Bederson. Pet. 31–32 (citing Ex. 1002 ¶¶ 91–93). We discuss above the Petition’s deficiencies with respect to reasoning to combine. *See supra* § III.D.3.b.

In its element-by-element analysis for element 1[G] in the Petition, Petitioner relies on Geva’s teachings relating to “Geva’s intensity/distance computation function 17 of the processing device 16” and determining the position of light emitting cursor device 10 in the “z” dimension. Pet. 32–33 (citing, *e.g.*, Ex. 1011, 7:32–35, 9:23–31, 9:35–10:6, Figs. 4, 7). Petitioner relies on these same teachings for element 1[E], which recites “determine, based on the output signal, a position of an object in a three-dimensional (3D) space relative to the interactive device.” *Id.* at 26–27 (citing Ex. 1011, 9:17–21, 9:23–31, 10:3–6). Dr. Bederson testifies that a person having ordinary skill in the art “would have understood that Geva’s ‘z’ dimension corresponds to the distance from Geva’s pen to the planar element which is continuously calculated as the pen moves positions and changes the intensity of light sensed by light sensor arrays 12 and 28.” Ex. 1002 ¶ 92. Petitioner cites as further supporting argument and evidence its contentions and evidence provided for elements 1[E], 1[F], and 11[D]. Pet. 31–33.

As discussed above (*see supra* § III.D.3.b), relying on the testimony of Dr. Cairns, Patent Owner argues that a person having ordinary skill in the art would not have attempted to make Petitioner’s proposed modification. Resp. 37.

Petitioner argues in its Reply that Patent Owner's argument "makes no sense" in part because "Geva can calculate Z-ranges." Reply 15. In a subsection of its Reply entitled "movement," Petitioner also argues the following:

Without explanation, PO asserts that "a POSITA would not have attempted to modify Keely to determine the object's 3D position/coordinate or any movement based on the same." POR, 37. But Keely does not need to be modified to respond to 3D movement. Indeed, Dr. Bederson explained how Keely already teaches the claimed "movement" features. Ex-1002 ¶¶91–94. PO itself cites some of Keely's passages specifically discussing tracking the pen as it is moved (POR, 36).

Reply 18. Petitioner also argues that Patent Owner "makes no attempt to explain how" Keely's teachings "do not teach determining 'movement' as claimed" and "[p]lainly they do." *Id.*

We start with Petitioner's reliance on Geva's title, abstract, and teachings relating to "Geva's intensity/distance computation function 17 of the processing device 16" and determining the position of light emitting cursor device 10 in the "z" dimension and well as Dr. Bederson's testimony regarding the understanding of a person having ordinary skill in the art. Pet. 18, 32–33 (citing, *e.g.*, Ex. 1011, codes (54), (57), 7:32–35, 9:23–31, 9:35–10:6, Figs. 4, 7). Geva's title is "Position Determining Input Device" and indicates nothing about whether the position is a two-dimensional or three-dimensional position. Ex. 1011, code (54). Geva's abstract states that "[a] further embodiment describes 3-D detection using 2 or 3 CCD or photodiode arrays." *Id.* at code (57).

Geva's teachings relating to "Geva's intensity/distance computation function 17 of the processing device 16" (Ex. 1011, 7:32–35, 9:23–31, 9:35–10:6) pertain to calculating "the position" of light emitting device 10 in the

third dimension. For instance, Geva teaches providing “an indication of *the position* in a third ‘z,’ dimension.” Ex. 1011, 7:32–35 (emphasis added). Geva also teaches “[i]n an optional feature of the preferred embodiment of the invention, the position-determining operation in two-dimensions, described previously, is used for calculating *the position* of the light emitting cursor device in a third ‘z,’ dimension,” which is “perpendicular to the first ‘x’ dimension and the second ‘y’ dimension.” *Id.* at 9:23–27 (emphasis added). Geva also teaches “the intensity/distance computation function 17 in the two-dimensional plane of FIG. 6” to determine “*the position* of the light emitting cursor device 10 in the third ‘z’ dimension.” *Id.* at 10:3–6.

Geva describes that it is “related to position-determining input devices.” *See, e.g., id.* at 1:6. Geva’s disclosure pertains to the structure of its position-determining input device and how the components of that device determine “the position” of light emitting cursor device 10. *See, e.g., id.* at 1:6–9, 7:32–35, 9:23–31, 9:35–10:6.

Geva teaches an optional feature with improved accuracy in which the position in the third dimension is *not* calculated. In particular, Geva teaches “[a]n optional feature of this embodiment of the invention is for the light emitting cursor device 10 to emit a beam of light *only when the light emitting cursor device 10 touches the planar element 14.*” Ex. 1011, 5:33–35 (emphasis added). According to Geva, that optional feature reduces “the diffraction of light from the light emitting cursor device 10” and “improv[es] the accuracy of the position-determining calculation of the processing device 16.” *Id.* at 5:35–38. Geva’s teachings regarding providing “an indication of *the position* in a third ‘z,’ dimension of the light emitting cursor device 10” apply only “[i]f the light emitting cursor device 10 does not touch the planar element 14, when emitting a light beam.” *Id.* at 7:32–35. In other words,

Geva's teachings regarding providing an indication of "the position" of light emitting cursor 10 in a third dimension do not apply to the optional feature that has improved accuracy.

Petitioner also relies on Figure 7 of Geva, which is reproduced below.

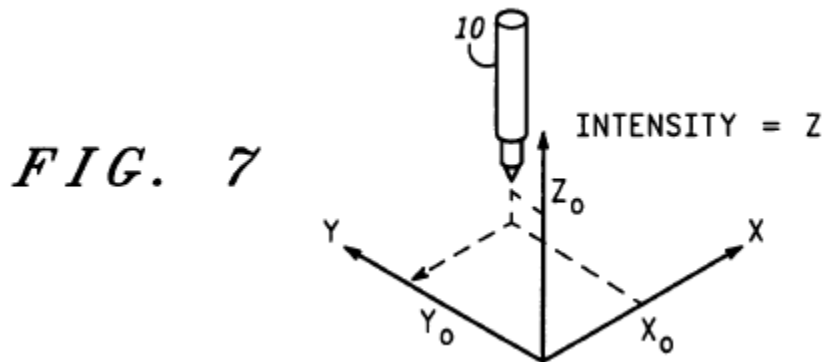


Figure 7, above, illustrates "how the light intensity measure in the two-dimensional plane of FIG. 6 is used to determine *the position* of a light emitting cursor device in a third dimension." Ex. 1011, 4:34–36 (emphasis added). Consistent with the disclosures above, Figure 7 of Geva illustrates a single position in three-dimensional space.

We turn to Dr. Bederson's testimony regarding the understanding of a person having ordinary skill in the art. Ex. 1002 ¶ 92. Dr. Bederson's testimony is as follows:

As seen in Figure 7, Geva's intensity/distance computation function 17 of the processing device 16 calculates the third-dimension position according to the intensity of light sensed by light sensor arrays 12 and 28. Ex-1011, 9:35–10:6; *see also id.*, 7:32–35 ("when emitting a light beam, the graph of FIG. 4 provides an indication of the position in a third, 'z,' dimension"). The maximum point of "intensity of light" is used to calculate the X_0 and Y_0 positions, Ex-1011, 9:35–10:6, and that intensity is then further used to calculate the Z position. A POSITA would have understood that Geva's "z" dimension corresponds to the distance from Geva's pen to the planar

element which is continuously calculated as the pen moves positions and changes the intensity of light sensed by light sensor arrays 12 and 28.

Ex. 1002 ¶ 92.

Contrary to Dr. Bederson's testimony, Geva does not use the terms "continuously," "moves," "movement," or other similar terms with respect to calculating the position in the third dimension. Dr. Bederson does not cite to any evidence other than Geva's description of calculating "the position" relied on in the Petition and discussed above. *Compare* Pet. 31–33 (citing Ex. 1011, 7:32–35, 9:23–31, 9:35–10:6, Figs. 4, 7), *with* Ex. 1002 ¶ 92 (citing Ex. 1011, 7:32–35, 9:35–10:6, Fig. 7).

As discussed above (*see* § III.D.3.b), Dr. Cairns testifies in support of Patent Owner's position. In particular, Dr. Cairns testifies "[t]hen-existing electronic devices such as Keely's notepad computer would have had to expend valuable processing cycles to attempt to calculate an object's 3D coordinate position, resulting in degraded and slower performance" and "in my opinion, Dr. Bederson fails to appreciate that at the time of the invention, existing electronic devices such as Keely's would have had to expend significant processing resource to even attempt to calculate an object's 3D position coordinate and movements based on the same." Ex. 2020 ¶¶ 99–100. Dr. Cairns also testifies that a person having ordinary skill in the art "would have understood that Keely's broader teachings specifically limit[s] its proximity/threshold detection to preserve processing power and optimize battery life." *Id.* ¶ 100. Dr. Cairns's testimony concludes "[t]hus, the proposed Keely-Geva combination does not disclose or suggest the claimed operations for determining the object's 3D position or movements based on the same." *Id.* Although Dr. Bederson provides a Reply Declaration

(Ex. 1044), Dr. Bederson does not respond to or address Dr. Cairns's testimony (Ex. 2020 ¶¶ 99–100).

We turn to Petitioner's arguments in its Reply that Patent Owner's argument "makes no sense" because "Geva can calculate Z-ranges." Reply 15. As discussed above Geva's teachings relating to "Geva's intensity/distance computation function 17 of the processing device 16" (Ex. 1011, 7:32–35, 9:23–31, 9:35–10:6) pertain to calculating "the position" of light emitting device 10 in the third dimension. Petitioner does not identify any evidence supporting its argument in its Reply.

We turn to Petitioner's arguments in its Reply relying on detection of movement performed by Keely. *See, e.g.*, Reply 18 (arguing "Keely *does not need to be modified*" because "Keely already teaches the claimed 'movement' features"). As explained above (*see supra* § III.D.3.a), we find that Petitioner's reliance on Keely's teachings of determining position is inconsistent with Petitioner's proposed combination in its Reply that "does not rely on any aspect of Keely II's alternative digitizer approaches." Reply 3. As explained above (*see supra* § III.D.3.a), Keely relies on Keely II for describing its hardware for obtaining the pen's location. Ex. 1006, 3:50–53 (explaining that the "present invention is directed to interface elements of a pen based, notepad or notebook computer, the hardware of which is described in the related application previously mentioned"), 6:3–5 (describing that the "process 100 associated with the core task tool display, as shown in more detail in FIG. 9, involves *obtaining the pen location from the digitizer grid control process*" (emphasis added)).

Petitioner's argument that Keely teaches *responding* to movement in a third dimension, i.e., that "Keely does not need to be modified to *respond to 3D movement*" (Reply 18 (emphasis added)) does not address determining

movement in a third dimension. As discussed above, Geva's teachings relate to calculating "the position" of light emitting device 10 in a third dimension. *See, e.g.*, Ex. 1011, 7:32–35, 9:23–31, 9:35–10:6, Fig. 7. Without Keely II's digitizer, Keely does not teach determining movement. *See, e.g.*, Ex. 1006, 6:3–9 ("The process 100 associated with the core task tool display, as shown in more detail in FIG. 9, involves *obtaining the pen location from the digitizer grid control process of the computer*" (emphasis added)).

In its Reply, Petitioner argues that "the correct combination[] is shown in Geva, Figure 8 (which is a perspective view of Figure 6), as modified to include an LCD, such as Keely's underneath the planar element." Reply 6–7. Petitioner does not indicate where in its Petition it relies on Geva's Figure 8. Contrary to Petitioner's argument that Figure 8 is simply a perspective view of Figure 6, Geva describes that in Figure 8 "[t]he planar element 14 is replaced by a beam splitter planar element 26." Ex. 1011, 10:15–16. Geva also describes an "alternative arrangement using a two-level beam splitter planar element" with respect to Figure 9 and "an optional feature to include a third light sensing element to measure the position of the light emitting cursor device 10 in a third dimension, as shown in FIG. 10." *Id.* at 10:35–11:13. We do not discern in the Petition or in Dr. Bederson's Declaration any reliance by Petitioner on Figures 8–10 of Geva or related description in Geva. Pet. 18–33; Ex. 1002 ¶¶ 69–94. Any such reliance subsequent to institution is improper, new argument. Furthermore, Geva's description is that the beam-splitter arrangement indicates the "x" and "y" positions of light emitting cursor device 10. *See, e.g., id.* at 10:27–34. Geva describes with respect to Figure 10 including "a third light sensing element," but Geva describes that the element would "measure *the position* of the light emitting cursor device 10 in a third dimension" *Id.* at 11:10–13.

Geva does not describe determining movement of light emitting cursor device 10 in a third dimension in connection with Figure 8–10. *See id.* at 10:15–11:30.

Furthermore, Petitioner has not set forth sufficiently a reason to combine Geva’s light sensors with Keely II’s hardware. *See supra* § III.D.3.b. As discussed above, Petitioner does not articulate reasoning to combine with rational underpinning with respect to “add[ing] Geva’s linear arrays at the edges of Keely’s LCD,” rather than replacing Keely’s sensors with Geva’s linear sensor array, which results in a “redundant Keely and Geva sensor combination,” as argued by Patent Owner. *See, e.g.,* Resp. 32.

Petitioner argues that *Intel Corp. v. PACT XPP Schweiz AG*, 61 F.4th 1373, 1380 (Fed. Cir. 2023) supports its unpatentability position. Tr. 21:24–23:8. Petitioner argues that the case was not presented prior to the hearing because it was decided recently. *Id.* The *Intel* case reminds us that it is not necessary to show that a combination is “the *best* option, only that it be a *suitable* option.” *Intel*, 61 F.4th at 1380 (quoting *Intel Corp. v. Qualcomm Inc.*, 21 F.4th 784, 800 (Fed. Cir. 2021)). Petitioner did not request authorization and did not file any paper regarding this case. Petitioner has no submission discussing relevance to that case to an issue in the instant proceeding.⁷

Furthermore, based on the complete record now before us, we find that Petitioner has not shown that Geva’s position-determining input device

⁷ Regarding Petitioner’s argument that the *Intel* case was recently decided, we note that the Federal Circuit previously has stated that it is not necessary to show that a combination is “the best option, only that it be a suitable option.” *PAR Pharm., Inc. v. TWI Pharms., Inc.*, 773 F.3d 1186, 1197–98 (Fed. Cir. 2014) (quoted in *Intel*, 21 F.4th at 800).

would have been a suitable replacement for Keely's digitizer. As we discuss in more detail herein, we find Dr. Bederson's testimony to be conclusory and unsupported. Patent Owner provided the testimony of Dr. Cairns (Ex. 2020 ¶¶ 99–100) and Petitioner has not provided responsive testimony to Dr. Cairns's testimony on this issue. Petitioner has simply cited to the *Intel* case during oral argument, but has not made a showing that its proposed combination would have been a suitable option. 61 F.4th at 1380. Petitioner must demonstrate that the claims are unpatentable, and that burden never shifts to the patentee. *Dynamic Drinkware*, 800 F.3d at 1378.

Based on the complete record now before us, we find that Petitioner's showing is deficient. Geva teaches calculating "*the position*" of the light emitting cursor device in a third "z," dimension. *See, e.g.*, Ex. 1011, 9:23–27, 10:3–6. Geva illustrates a single position in three-dimensional space. *See, e.g., id.* at Fig. 7. Petitioner relies on the same teachings in Geva for calculating "the position" for element 1[E], which recites "determine, based on the output signal, a position of an object in a three-dimensional (3D) space relative to the interactive device." Pet. 26–27 (citing Ex. 1011, 9:17–21, 9:23–31, 10:3–6). Element 1[G], however, recites a separate requirement, i.e., "determine, based on a change in the output signal, *movement of the object relative to the interactive device in a third dimension of the 3D space.*"

As noted above, Patent Owner argues element 1[G] includes language added during prosecution to overcome prior art. Resp. 9. Specifically, Patent Owner argues that the emphasized language was added: "determine, based on a change in the output signal, movement of the object relative to the *interactive device in a third dimension of the 3D space*" (emphasis added). We agree with Patent Owner that the emphasized language in element 1[G]

was added by amendment to overcome prior art during prosecution of the application that issued as the '369 patent. Ex. 2025, 487; Ex. 1004, 460.⁸ Also, during prosecution of the '369 patent, Geva was cited in an Information Disclosure Statement that was initialed by the Examiner. Ex. 2025, 438; Ex. 1004, 414.⁹ Indeed, Petitioner states that the Examiner “acknowledged Applicant’s Information Disclosure Statement (IDS) listing Geva (Ex-1011).” Pet. 5; *see also* Ex. 1002 ¶ 33 (testifying to the same).

Based on the complete record now before us, we find that for the recitation in element 1[G], Petitioner relies on only Dr. Bederson’s testimony that a person having ordinary skill in the art “would have understood that Geva’s ‘z’ dimension corresponds to the distance from Geva’s pen to the planar element which is continuously calculated as the pen moves positions and changes the intensity of light sensed by light sensor arrays 12 and 28.” Ex. 1002 ¶ 92. Upon consideration of the argument and evidence by both parties, we find Dr. Bederson’s testimony is conclusory and unsupported.

Testimony cannot take the place of disclosure in a prior art reference, when that disclosure is required as part of the unpatentability analysis. *See* CTPG at 36. More specifically, the Consolidated Trial Practice Guide sets forth the following:

Expert testimony, however, cannot take the place of a disclosure in a prior art reference, when that disclosure is required as part of the unpatentability analysis. For example, because “[a] claim is anticipated only if each and every element as set forth in the

⁸ For exhibits 1004 and 2025, we use the pagination added by the submitting party.

⁹ Although not relied on for independent claim 1, Kameyama also was cited in that Information Disclosure Statement that was initialed by the Examiner. *Id.*

claim is found, either expressly or inherently described, in a single prior art reference,” *Verdegaal Bros., Inc. v. Union Oil Co. of Cal.*, 814 F.2d 628, 631 (Fed. Cir. 1987), a petitioner asserting anticipation cannot rely on its expert to supply disclosure of a claim element that is not expressly or inherently present in the reference. Similarly, in an obviousness analysis, conclusory assertions from a third party about general knowledge in the art cannot, without supporting evidence of record, supply a limitation that is not evidently and indisputably within the common knowledge of those skilled in the art. *K/S Himpp v. Hear-Wear Techs., LLC*, 751 F.3d 1362, 1365 (Fed. Cir. 2014). Furthermore, because an *inter partes* review may only be requested “on the basis of prior art consisting of patents or printed publications,” 35 U.S.C. § 311(b), expert testimony cannot take the place of disclosure from patents or printed publications. In other words, expert testimony may explain “patents and printed publications,” but is not a substitute for disclosure in a prior art reference itself.

CTPG at 36. We, therefore, find that Dr. Bederson’s testimony (Ex. 1002 ¶ 92) does not remedy the deficiency in Geva’s disclosures. Petitioner has not shown that Geva teaches element 1[G].

For the reasons given, after consideration of the assertions and the evidence based on the complete record now before us, we determine that Petitioner has not shown that its combination of Keely and Geva teaches element 1[G] of claim 1.

(2) *Element 1[H]: “execute, based on the movement of the object, a function related to at least one of the one or more selectable options.”*

Petitioner asserts that the Keely teaches element 1[H]. Pet. 33. Petitioner cites as supporting argument and evidence its contentions and evidence provided for element 11[D]. *Id.* As Petitioner asserts with respect to element 11[D] (*id.* at 30), Keely teaches that “[i]f the pen comes down on the object or element with a tap, the system selects 34 the object.” Ex. 1006, 4:34–35. With respect to executing based on movement, Petitioner relies on

(Pet. 33) Keely’s teaching that “[w]hen the pen is pulled up the tool (or the process associated with the tool icon) is started 122.” Ex. 1006, 6:20–23.

Petitioner also relies on (Pet. 33) Keely’s teaching that “[a]ctivation starts a process represented by displayed information or an interface element.”

Ex. 1006, 4:45–47.

Petitioner asserts that Keely teaches “a function related to at least one of the one or more selectable options” recited in element 1[H] based on Keely’s teachings relating to “tools such as ‘write,’ ‘type,’ ‘select,’ ‘new,’ ‘flag,’ ‘find,’ ‘send,’ and ‘dog-ear.’” Pet. 33 (citing Ex. 1006, 5:46–6:2, Fig. 8). Keely provides more details describing, for instance, “Write (70)” as offering “pen tips and a color palette,” “Type (72)” as displaying “character recognition results,” “Select (74)” as providing “cut, copy and paste functions,” “New (76)” as presenting a new page, “Flag (78)” as allowing “users to add markers and links” among other things, “Find (80)” as allowing the user to find an object, “Send (82)” as allowing the user to send mail, among other things, and “Dog-ear” as showing or hiding a page index. Ex. 1006, 5:46–6:2.

Based on the complete record now before us, we find that Petitioner’s showing is deficient. Petitioner’s reliance on Keely’s position determining is contrary to its proposed combination of Keely and Geva on pages 3–4 of its Reply. The recitation of “the movement” in element 1[H] derives antecedent basis from element 1[G]. Petitioner relies entirely on Keely for element 1[H] and, therefore, Petitioner does not remedy the deficiency discussed with respect to element 1[G].

For the reasons given, after consideration of the assertions and the evidence based on the complete record now before us, we determine that

Petitioner has not shown that its combination of Keely and Geva teaches element 1[H] of claim 1.

(3) *Conclusion — Claim 1 and Elements 1[G] and 1[H]*

As a separate, independent reason for our conclusion herein, after consideration of the arguments and the evidence in the complete record now before us, we determine that Petitioner has not shown that its prior art combination teaches all recitations in claim 1. Accordingly, we conclude that Petitioner has not demonstrated by a preponderance of the evidence that claim 1 is unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Keely and Geva.

4. *Independent Claim 11*

With respect to whether Petitioner has offered articulated reasoning with a rational underpinning as to why one of ordinary skill in the art would have combined the teachings of Keely and Geva in the manner recited in claim 1, Petitioner relies on the same contentions for claims 1 and 11. Pet. 18–35. Also, claim 11 recites “calculating, by the processor, a change in the distance based on the light detected by the one or more sensors,” referred to by Petitioner as element 11[E], and “executing, by the processor, a function related to the at least one selectable element based on the change in the distance,” referred to by Petitioner as element 11[F]. Pet. 31–33. Petitioner’s contentions for elements 11[E] and 11[F] are the same as its contentions for elements 1[G] and 1[H]. Petitioner’s contentions for claim 11 do not remedy the deficiencies discussed with respect to independent claim 1.

Accordingly, we conclude that Petitioner has not demonstrated by a preponderance of the evidence that claim 11 is unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Keely and Geva.

5. *Dependent Claims 2–9 and 12–16*

Claims 2–9 depend, directly or indirectly, from claim 1. Claims 12–16 depend, directly or indirectly, from claim 11. Petitioner’s contentions for claims 2–9 and 12–16 do not remedy the deficiencies discussed with respect to independent claims 1 and 11. Accordingly, we conclude that Petitioner has not demonstrated by a preponderance of the evidence that claims 2–9 and 12–16 are unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Keely and Geva.

E. *Unpatentability of Claims 10 and 17 under 35 U.S.C. § 103(a) as Obvious over Keely, Geva, and Kameyama*

Petitioner asserts that claims 10 and 17 are unpatentable as obvious over Keely, Geva, and Kameyama. Pet. 3. We begin with an overview of Kameyama. We then turn to Petitioner’s contentions.

1. *Kameyama*

Kameyama relates to a three-dimensional pointing device for inputting or outputting position or posture data of a three-dimensional space into and from a computer in a simulation. Ex. 1012 ¶ 1. Figure 2 illustrates radiating light in a conical shape onto light receiving surface 5. *Id.* ¶ 19.

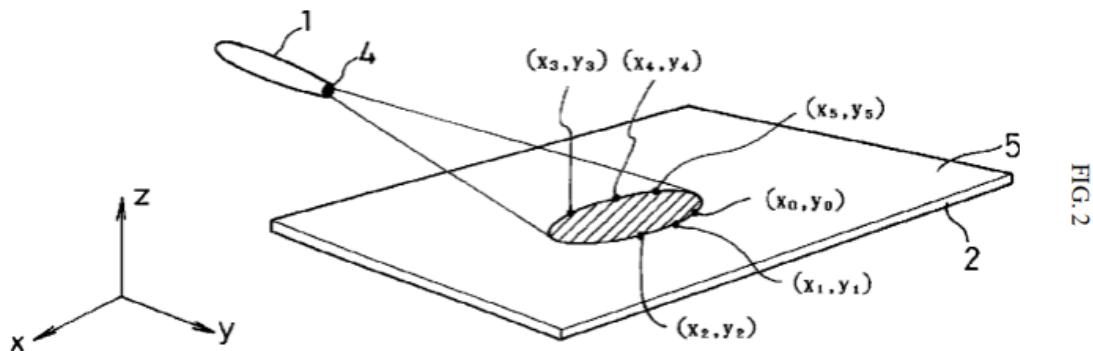


Figure 2 is a schematic diagram illustrating light radiating in a conical shape. *Id.* at 14.¹⁰ Kameyama describes that a spatial position (three-dimensional position) of light source 4 of light generator 1 can be derived based on light reception information received by the light receiving elements of the light receiving surface 5. *Id.* ¶ 31.

2. *Claims 10 and 17*

Claim 10 depends directly from claim 1. Claim 17 depends directly from claim 11. Petitioner's contentions for claims 10 and 17 do not remedy the deficiencies discussed with respect to independent claims 1 and 11. Accordingly, we conclude that Petitioner has not demonstrated by a preponderance of the evidence that claims 10 and 17 are unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Keely, Geva, and Kameyama.

IV. CONCLUSION

The outcome for the challenged claims is set forth below. In summary:

Claims Challenged	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not shown Unpatentable
1–9, 11–16	103(a)	Keely, Geva		1–9, 11–16
10, 17	103(a)	Keely, Geva, Kameyama		10, 17
Overall Outcome				1–17

¹⁰ This citation is to page 14 of Exhibit 1012, which does not include paragraph numbers.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1–17 of the '369 patent have not been shown to be unpatentable; and

FURTHER ORDERED that because this is a Final Written Decision, 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.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD. and
SAMSUNG ELECTRONICS AMERICA, INC.,
Petitioner,

v.

POWER2B INC.,
Patent Owner.

IPR2022-00325
Patent 9,946,369 B2

Before BARBARA A. PARVIS, JOHN D. HAMANN, and
JASON W. MELVIN, *Administrative Patent Judges*.

MELVIN, *Administrative Patent Judge*, dissenting.

I respectfully dissent. In my view, the majority reaches an incorrect conclusion on each determinative issue.

As to whether the Reply introduces new argument and evidence, I do not read the Petition as relying on a combination with redundant sensors. Without doubt, the Petition points out similarities between Keely and Geva's systems. It does so to support that "Keely and Geva provide complementary solutions." Pet. 18. While similarity does not itself justify a combination, it does support that the two reference's teachings would work together.

The majority determines that the "Petition relies on Keely's teachings of determining position." None of the bases on which the majority relies,

however, supports that conclusion. First, the majority cites Petitioner's contentions regarding the preamble. But without construing the preamble as an affirmative limitation, any assertion regarding the preamble is not a relevant reliance. As to element 1[A], Petitioner relies on Keely's housing including "all of the components" to satisfy that Keely's structure teaches a "housing having a screen." Pet. 19. While Petitioner points out that Keely's housing includes sensors, that does not define Petitioner's combination to include all of Keely's structure, it simply supports Petitioner's contention that Keely's "unitary housing" is a structure that satisfies the claim language. As to element 1[B], Petitioner again points out that Keely's computer includes sensors within its housing. Pet. 20. But the Petition does not contend those sensors map to the claimed "plurality of light sensors." Instead, after detailing Geva's "light sensors arrays 12 and 28," the Petition submits that skilled artisans "would have used Geva's light sensor arrays detecting light from the 'light emitting cursor device' incident on planar element 14 (outlined in red in Figure 6) to detect light on Keely's display screen." Pet. 22. In my view, that contention plainly sets forth a combination using Geva's sensor (including planar element 14) with Keely's display.

The majority relies additionally on Petitioner's contentions regarding elements 1[E] and 11[B], which require determining an object's three-dimensional position. But when the Petition points out that Keely "determines a three-dimensional position, but leaves the implementation details" to skilled artisans (Pet. 26), that again establishes Keely's teachings that facilitate the combination; it does not define the combination. Instead, the Petition again details Geva's relevant teachings before submitting that skilled artisans "would have been motivated to include determining the three-dimensional position of the stylus relative to the interactive device

based on the light detected, as taught by Geva, into Keely's notepad computer." Pet. 27. That contention, in my view, sets forth a combination that is unambiguous and readily understood.

Element 1[F] requires "determining the position of the object corresponds to one of the selectable options," which is not a position determination itself, but a comparison between a determined position and a selectable option in the interface. So, when Petitioner asserts that "Keely determines the position of the object in the planar horizontal (X-Y) direction of the 3D space," that does not implicate a combination that includes Keely's digitizer or other sensor elements.

Based on the foregoing, I believe the majority reaches an incorrect conclusion that the Petition relies on a redundant Keely and Geva sensor combination. Petitioner's contentions in the Reply are consistent with how I read the Petition.

Next, the majority concludes that the Petition does not adequately support that skilled artisans would have replaced Keely's sensors with Geva's sensors. Again, I believe that conclusion is incorrect. The Petition asserts that skilled artisans would have used "Geva's light sensor arrays detecting light from the 'light emitting cursor device' incident on planar element 14 because doing so would be a simple design choice in order to collect the positional input for 'interacting' with electronic documents." Pet. 22. That is sufficient. Petitioner's contention that Geva's detection structure would "collect the positional input" establishes that the structure provides a function relevant and applicable to Keely's device. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007) ("[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the

technique is obvious unless its actual application is beyond his or her skill.”).

The Petition, however, further justifies the combination. It asserts that the combination would realize “the added benefits of Geva such as ‘low power consumption,’ ‘immun[ity] to noise,’ and that it ‘does not produce radio frequency interference (RFI) noise.” Pet. 23 (quoting Ex. 1011, 2:37–39). Those additional benefits, which come directly from Geva’s teachings, additionally support the combination and undermine the majority’s conclusion that Petitioner has not articulated reasoning with rational underpinning.

The majority relies on Patent Owner’s contentions that the combination would have “disadvantages associated with replacing Keely’s digitizer with Geva’s technology.” Those disadvantages, however, do not undermine the reasons skilled artisans would have made the combination. Indeed, “[i]t’s not necessary to show that a combination is ‘the best option, only that it be a suitable option.’” *Intel Corp. v. Qualcomm Inc.*, 21 F.4th 784, 797 (Fed. Cir. 2021) (quoting *PAR Pharm., Inc. v. TWI Pharms., Inc.*, 773 F.3d 1186, 1197–98 (Fed. Cir. 2014)). Here, Petitioner has done exactly that by showing Geva would work “to collect the positional input for ‘interacting’ with electronic documents.” Pet. 22; *see* Pet. 18, 20–22.

The majority concludes also that the combination fails to show element 1[G], which requires determining movement of the object in a third dimension. Part of that conclusion is that Geva’s stated advantages relate to its two-dimensional position determination. It seems the majority concludes that Petitioner has not justified including Geva’s method of determining the object’s position in the third dimension. But, as the Petition asserts, Keely

itself determines a three-dimensional position, and therefore using Geva's method as part of the combination would provide implementation details and would satisfy Keely's need to "consider[] the pen's three-dimensional position in displaying tool options and selection." Pet. 26–27. The majority reads that portion of the Petition as contrary to Keely, in that the majority views Keely as relying on implementation details from Keely II and thus rejects the contention that Keely considering the pen's position is a reason to modify Keely. I do not agree. Because Keely uses the pen's three-dimensional position, skilled artisans would have had reason to use other suitable ways of providing that position. That Keely already has a way of determining three-dimensional position does not cut against a combination using Geva's approach for doing so. *See Intel Corp. v. PACT XPP Schweiz AG*, 61 F.4th 1373, 1380 (Fed. Cir. 2023) (holding the Board erred by concluding there was no reason to combine in part because the base reference "already addresses" a problem). As discussed above, Petitioner already justifies using Geva's detection hardware, and including the third-dimension is the only logical approach if incorporating that hardware in a system that makes use of the third dimension.

The majority seems to conclude that the Petition separately lacks a reason "to use Keely's processing unit for communication with the sensor array." But the Petition points out that Keely's computer includes a processing unit as a basic component, and that skilled artisans would have had reason to use that processing unit to receive and process signals from Geva's sensor system "to achieve cost and power usage savings, as microprocessors are general purpose programmable devices." Pet. 24–25. That, in my view, is sufficient. *PACT XPP*, 61 F.4th at 1380 ("Additionally, 'universal' motivations known in a particular field to improve technology

provide ‘a motivation to combine prior art references *even absent any hint of suggestion* in the references themselves.’” (quoting *Qualcomm*, 21 F.4th at 797–99)).

Finally, the majority finds that Petitioner’s combination does not teach elements 1[G] or 1[H]. Those findings rely on the idea that, although Geva teaches determining a position in the third dimension (z), it does so in a static manner that would not indicate movement in that dimension. This notion makes little sense. Geva discloses determining the input device’s z-position using the same “intensity/distance computation function 17” that determines the x-y position. Ex. 1011, 5:18–20, 9:23–31. Geva also discloses optionally emitting a beam of light “only when the light emitting cursor device 10 touches the planar element 14” (5:33–35), which would only provide usable functionality if the z-position is determined continuously as Petitioner asserts. Geva’s disclosures amply support that it would determine all three dimensions iteratively, to track the input device. *See id.* at 11:10–30. The majority concludes that skilled artisans would not have used Geva’s teachings in that regard because it would have required “valuable processing cycles” to track three dimensions rather than two. As discussed above, however, that points to a tradeoff that is inherent in the design process—increased functionality generally comes at some cost, but that incremental cost does not undermine an otherwise justified combination.

As to element 1[H], the majority concludes that Petitioner relies on Keely’s position determining, in contradiction to a combination that uses Geva’s structure. But element 1[H] recites the capability to execute a function based on the object’s movement, and therefore does not implicate the position-determining mechanism. Consistent with that limitation, the Petition relies on Keely’s user-interface actions (Pet. 33) and I do not read

anything about that reliance to be contrary with the asserted combination.

Once the combination determines position using Geva's structure, Keely's interface would use the position to execute actions, consistent with Keely's teachings.

In summary, I believe the majority reaches conclusions that contradict the case law by misreading the Petition and focusing on Patent Owner's arguments that, under the case law, do not undermine Petitioner's contentions.

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