

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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

v.

POWER2B INC.,  
Patent Owner.

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IPR2022-00315  
Patent 10,664,070 B2

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Before BARBARA A. PARVIS, SHEILA F. McSHANE, and  
JOHN D. HAMANN, *Administrative Patent Judges*.

PARVIS, *Administrative Patent Judge*.

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

## 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 1–18 (“challenged claims”) of U.S. Patent No. 10,664,070 B2 (Ex. 1001, “the ’070 patent”) pursuant to 35 U.S.C. §§ 311–319, along with the supporting Declaration of Benjamin B. Bederson, Ph.D. (Ex. 1002). Power2B, Inc. (“Patent Owner”) did not file a Preliminary Response.

We have authority to determine whether to institute review under 35 U.S.C. § 314 and 37 C.F.R. § 42.4.

Upon consideration of the contentions and the evidence of record at this juncture, we conclude Petitioner establishes a reasonable likelihood of prevailing in demonstrating the unpatentability of claims 1–18 of the ’070 patent. Accordingly, we grant Petitioner’s request, and institute an *inter partes* review of all challenged claims of the ’070 patent and with respect to all grounds set forth in the Petition.

## 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 5, 2.

### B. *Related Matters*

Each party identifies a judicial matter that would affect, or be affected by, a decision in this proceeding. In particular, the parties inform us that the ’070 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 5, 2. Petitioner also

has 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. 9,946,369 B2 (IPR2022-00325); (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).

### C. The '070 patent

The '070 patent relates to computer navigation and an apparatus that facilitates navigation of software stored on the apparatus. Ex. 1001, 1:25–28. Figure 1, below, shows device 10.

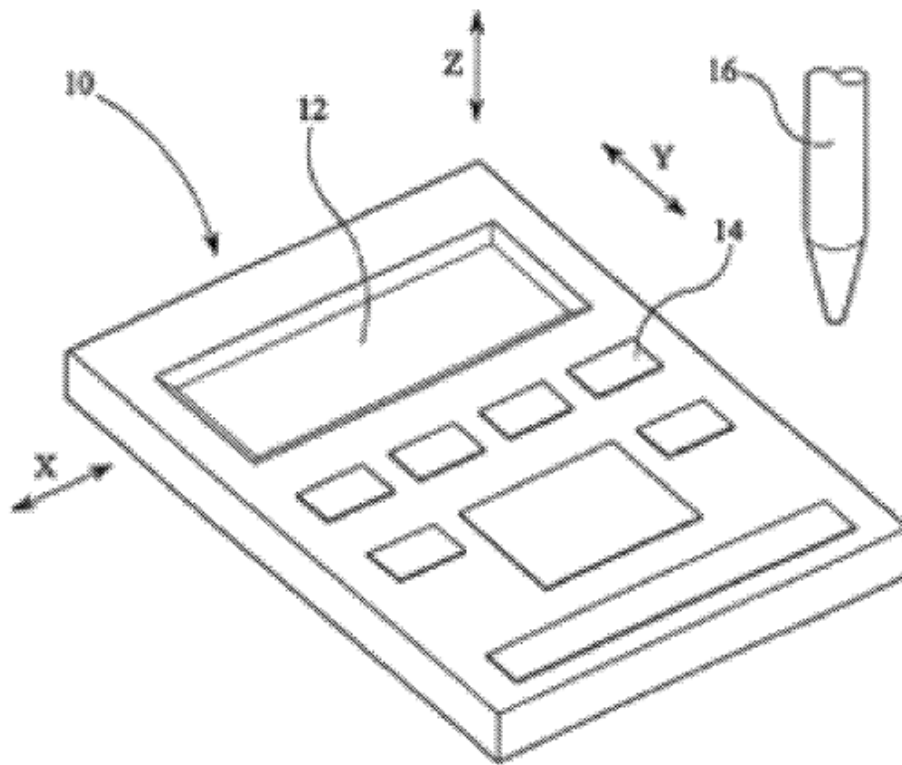


FIG. 1

Figure 1, above, illustrates device 10 having display 12, buttons 14, and stylus 16. *Id.* at 2:61–63, 3:38–44.

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 2:54–57. 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 2:57–62. Stylus 16 takes the form of a pen-shaped instrument and allows the user to select various options displayed on display 12. *Id.* at 3:38–44.

Stylus 16 emits a beam of light, such as infrared or other spectrum light. *Id.* at 4:63–65. The light is sensed by a sensitive layer (not shown) that is positioned over or incorporated in display 12. *Id.* at 4:65–67. 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 4:66–5:2. The beam of light emitted by stylus 16 is detected by the sensitive layer. *Id.* at 5:4–5. 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 5:5–10. 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 6:6–22.

#### *D. Illustrative Claim*

Petitioner challenges claims 1–18 of the '070 patent. Pet. 1. Claims 1, 10, and 16 are the independent claims. Claims 2–9 and 11 depend, directly or indirectly, from claim 1. Claims 12–15 depend, directly or indirectly, from claim 10. Claims 17 and 18 depend, directly or indirectly, from claim 16. Independent claim 1, reproduced below, is illustrative of the claimed subject matter.

1. 1[Pre]<sup>1</sup> An interactive device comprising:

1[A] a stylus for emitting a beam of electromagnetic radiation;

1[B] a display screen disposed in a housing, the display screen displaying one or more selectable icons, the display screen forming a touch-sensitive display plane;

1[C] a sensor array disposed in the housing and forming a sensitive layer in a sensor plane proximate to the display screen, the sensor array is configured to detect at least a portion of the beam of electromagnetic radiation incident on the display screen; and

1[D] a processing unit configured to:

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<sup>1</sup> Petitioner's designations to reference the elements of claim 1 are set forth in brackets. Pet. 20–34. Herein we refer to the elements of claim 1 using Petitioner's designations.

- 1[E] receive an output signal from the sensor array;
- 1[F] determine the output signal from the sensor array corresponds to a distribution pattern of electromagnetic radiation;
- 1[G] determine a three-dimensional position of the stylus relative to the interactive device based on the distribution pattern;
- 1[H] determine the three-dimensional position of the stylus corresponds to a first selectable icon of the one or more selectable icons based on the output signal;
- 1[I] determine at least a portion of the output signal corresponds to a selection function associated with the first selectable icon; and
- 1[J] execute, based on the selection function, a function related to the first selectable icon.

Ex. 1001, 8:10–35.

*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. 10, 1996 | 1011    |
| Kameyama | JP H05-265637, published Oct. 15, 1993  | 1012    |

*F. Asserted Grounds*

Petitioner asserts that the challenged claims of the '070 patent are unpatentable based on the following grounds summarized below (Pet. 3):

| Claims Challenged | 35 U.S.C. §         | Reference(s)/Basis    |
|-------------------|---------------------|-----------------------|
| 1–6, 8–17         | 103(a) <sup>2</sup> | Keely, Geva           |
| 7, 18             | 103(a)              | Keely, Geva, Kameyama |

### 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 evidence of nonobviousness.<sup>3</sup> *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

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<sup>2</sup> 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 ’070 patent and uses the June 9, 2003, date of the earliest provisional patent application, PCT/GB03/02533. Pet. 12. On this record, we refer to the pre-AIA version of 35 U.S.C. § 103.

<sup>3</sup> Patent Owner does not present objective evidence of nonobviousness at this stage of the proceeding.

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. 12 (citing Ex. 1002 ¶¶ 39, 42–58). At this stage in the proceeding, Petitioner’s proposal is unopposed.

We find that 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 do not adopt that aspect of the proposal. With that exception, considering the subject matter of the ’070 patent, the background technical field, and the asserted prior art, we otherwise agree with Petitioner’s proposed qualifications for an ordinary level of skill. Petitioner’s proposed definition is consistent with the level of skill reflected in the specification of the ’070 patent and the asserted prior art references. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001).

Accordingly, for purposes of this decision, and based on the current record, we adopt Petitioner’s assessment of the level of skill for one of ordinary skill in the art, with the “at least” phrase omitted.

### 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. 13. Petitioner also states “[c]laim construction proceedings have not yet begun in district court” and it “will request leave to submit the district court’s claim construction as soon as it becomes available.” *Id.*

For purposes of this decision, we determine we need not construe any claim term. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017)), *cert. denied*, 138 S. Ct. 1695 (April 30, 2018) (noting that “we need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy’”) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

*D. Unpatentability of Claims 1–6 and 8–17 under 35 U.S.C. § 103(a) as Obvious over Keely and Geva*

Petitioner asserts that claims 1–6 and 8–17 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**

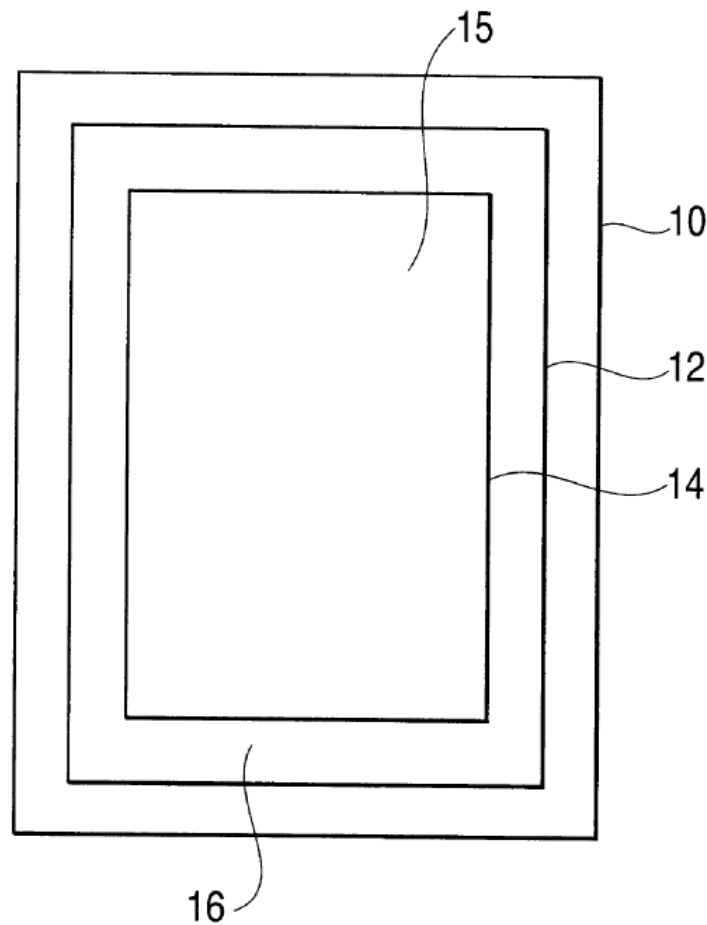


Figure 1, above, illustrates liquid crystal display 10 with display area 12 and tool region 16. *Id.* at 3:53–60, 5:20–23.

Display area 12 has writing surface 15, which is inset for tool region 16. *Id.* Liquid crystal display 10 is included in 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.

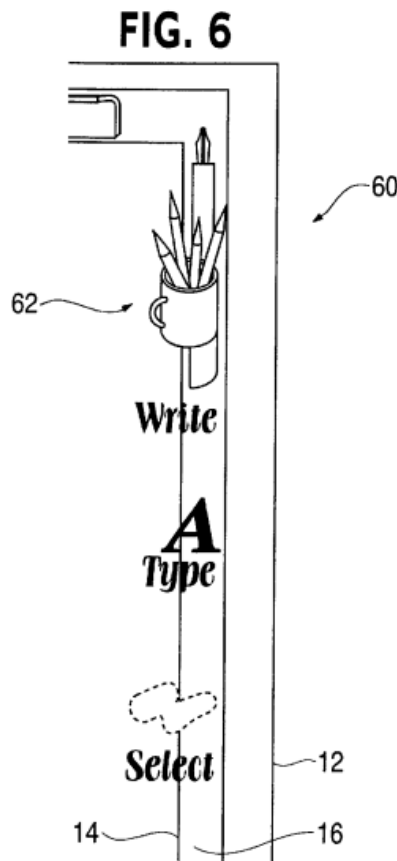


Figure 6, above, illustrates cup 62 of writing instruments fully visible in tool region 16. *Id.* at 5:17–23, Fig. 6.

Cup 62 is an exemplary core task tool and, more specifically, is a writing tool. *Id.* at 5:15–19. 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. Figure 6, below, illustrates a position-determining input device. *Id.* at 8.

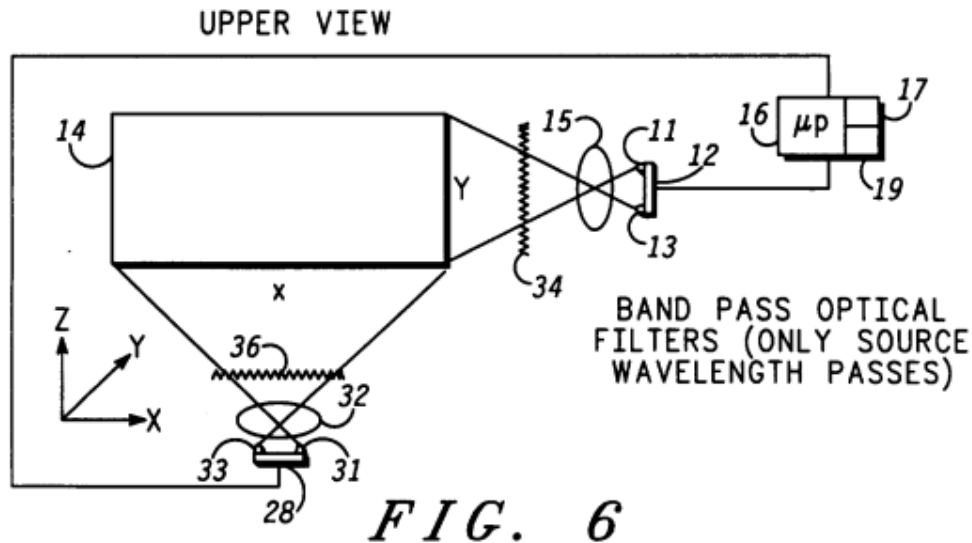


Figure 6, above, is an upper view of a position-determining input device including planar element 14, two light sensor arrays 12 and 28, and processing device 16, among other things. *Id.* at 8–9.

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 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 through band-pass optical filters 34 and 36, which are arranged to select only the desired light source. *Id.* at 9. 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 the processing device 16. *Id.* 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 the first and second light sensor arrays 28 and 30. *Id.* The three-dimensional position is calculated. *Id.* at 9–10.

3. *Independent Claim 1*

a) *Reasoning to Combine*

Petitioner contends that a person having ordinary skill in the art “would have understood” that Keely and Geva “disclose interrelated teachings that reasonably would have been combined in predictable ways.” Pet. 19. Petitioner contends that the references “provide complimentary solutions” and “propose solutions using related types of hardware and software.” *Id.*

Petitioner also provides contentions regarding reasoning to combine in its element-by-element analysis. *Id.* at 20–34. We discuss Petitioner’s contentions below.

b) *Element 1[Pre]: “[a]n interactive device comprising”*

Relying on the testimony of Dr. Bederson, Petitioner asserts that Keely teaches the preamble “to the extent” the preamble is limiting. Pet. 20 (citing Ex. 1006, 1:12–16; Ex. 1002 ¶¶ 71–72).<sup>4</sup> The portion of Keely cited in the Petition is reproduced below.

The present invention is directed to a notepad or notebook computer interface that facilitates in input via a pen and, more particularly, to a system that provides interface elements

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<sup>4</sup>We need not determine whether the preamble is limiting because, regardless, at this juncture Petitioner makes a sufficient showing.

particularly suitable for pen-based input to, and interaction with, electronic documents.

Ex. 1001, 1:12–16 (cited in Pet. 20).

Petitioner’s assertion is supported sufficiently at this juncture by the cited portion of the asserted prior art. After consideration of the assertion and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently that Keely teaches the preamble for purposes of institution.

*c) Element 1[A]: “a stylus for emitting a beam of electromagnetic radiation”*

Relying on the testimony of Dr. Bederson, Petitioner asserts that the combination of Keely and Geva teaches element 1[A]. Pet. 21–22 (citing, e.g., Ex. 1002 ¶¶ 42, 73–74). Petitioner asserts that “Keely is agnostic as to its specific pen technology, but it would have been obvious to use a stylus for emitting a beam of electromagnetic radiation in Keely in view of the disclosure of Geva.” *Id.* at 21 (citing Ex. 1002 ¶ 73). Regarding the recitation of “a stylus” in element 1[A], Petitioner turns to Geva’s position-determining input device comprising light emitting cursor device 10. *Id.* (citing Ex. 1011, 5:12–16, 5:22–23, 7:32–8:5). Geva teaches “[i]n operation, the light emitting cursor device 10, e.g. an active light pen, emits a beam of light on to the planar element 14.” Ex. 1011, 5:22–23.

Regarding the recitation that the stylus emits “a beam of electromagnetic radiation” in element 1[A], Dr. Bederson testifies that electromagnetic radiation “includes ‘[h]eat and radio waves, light waves, and ultraviolet and infrared rays, X-rays, and cosmic rays.’” Ex. 1002 ¶ 42 (citing Ex. 1034, 25–26). Dr. Bederson testifies a person having ordinary skill in the art “would have understood that light, including ultraviolet and

infrared, is electromagnetic radiation with wavelengths between approximately 100 nm and 1  $\mu$ m, that can be emitted in a beam.” *Id.* ¶ 73.

Petitioner also provides reasoning to combine the teachings of Keely and Geva, and cites as supporting evidence the testimony of Dr. Bederson. Pet. 21–22 (citing Ex. 1002 ¶¶ 73–74). Dr. Bederson testifies that a person having ordinary skill in the art would have made the proposed combination because Geva teaches that its invention is “an ‘improved alternative’ to the different well-known digitizing technologies at the time.” Ex. 1002 ¶ 74 (Ex. 1011, 1:15–18, 2:19–21). Dr. Bederson further testifies that a person having ordinary skill in the art would have made the proposed combination because Geva teaches that its device “has low power consumption, is immune to noise and does not produce radio frequency interference (RFI) noise.” *Id.* (citing Ex. 1011, 2:37–39).

Petitioner’s assertions and Dr. Bederson’s testimony are supported sufficiently at this juncture by the cited portions of the asserted prior art. Also, at this juncture, we are persuaded that Petitioner has 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 proposed. After consideration of the assertions and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently that the combination of Keely and Geva teaches element 1[A] of claim 1 for purposes of institution.

*d) Element 1[B]: “a display screen disposed in a housing, the display screen displaying one or more selectable icons, the display screen forming a touch sensitive display plane;”*

Petitioner asserts that Keely teaches element 1[B] and cites as supporting evidence the testimony of Dr. Bederson. Pet. 23 (citing Ex. 1002

¶ 75). Regarding “a display screen disposed in a housing” recited in element 1[B], Petitioner relies on (*id.*) Keely’s teaching that “notebook or notepad computer includes a liquid crystal display 10, as depicted in FIG. 1, with a display area 12 of a size and shape approximating a piece of paper.”

Ex. 1006, 3:50–56. Regarding the recitation that the screen display “one or more selectable icons,” Petitioner relies on (Pet. 23) Keely’s teaching that “[t]he interface includes a core task tool region adjacent to the page where tool icons are partially visible until the pen is brought near one of the icons, at which time it becomes fully visible.” Ex. 1006, 2:28–31. Regarding the recitation that the screen form “a touch sensitive display plane,” in a portion of Keely relied on by Petitioner, Keely describes buttons that can be provided as physical buttons “or touch-screen buttons that appear in the tool region alongside or below the displayed page.” Ex. 1006, 12:47–48 (cited in Pet. 23).

Dr. Bederson testifies that a person having ordinary skill in the art “would have understood that the ‘notebook’ or ‘notepad’ computer includes all of the components, including the display, processors, memory, sensors, and other components in a unitary housing, to ensure maximum mobility.” Ex. 1002 ¶ 75. Dr. Bederson also testifies that “Keely’s touch-sensitive plane can be used as Geva’s planar element.” *Id.*

Petitioner’s assertions and Dr. Bederson’s testimony are supported sufficiently at this juncture by the cited portions of the asserted prior art. After consideration of the assertions and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently that Keely teaches element 1[B] for purposes of institution.

*e) Element 1[C]: “a sensor array disposed in the housing and forming a sensitive layer in a sensor plane proximate to the display screen, the sensor array is configured to detect at least a portion of the beam of electromagnetic radiation incident on the display screen; and”*

Relying on the testimony of Dr. Bederson, Petitioner asserts that the combination of Keely and Geva teaches element 1[C]. Pet. 24–26 (citing, e.g., Ex. 1002 ¶¶ 76–78). Regarding the recitations of “a sensor array . . . forming a sensitive layer in a sensor plane” and “the sensor array is configured to detect at least a portion of the beam of electromagnetic radiation incident on the display screen” in element 1[C], Petitioner relies on Geva’s teachings relating to light sensor arrays 12 and 28. *Id.* at 25 (citing Ex. 1011, 8:32–9:7, Fig. 6). Geva teaches “[t]he 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.” Ex. 1011, 8:36–38. Geva also teaches “[t]he two light sensor arrays 12 and 28 are respectively coupled to optical lenses 15 and 32 through band-pass optical filters 34 and 36 which are arranged to select only the desired light source.” *Id.* at 9:1–3. Regarding the recitation that the sensor array is “disposed in the housing,” Petitioner notes its contentions for element 1[B] and asserts that Keely’s “housing would have been understood as the unitary housing of the ‘notebook’ or ‘notepad’ computer that includes all of the components, including the display, processors, memory, sensors, which ensures maximum mobility.” Pet. 24–25 (quoting Ex. 1002 ¶ 76).

Regarding reasoning to combine, Dr. Bederson testifies that the proposed combination would have been obvious to a person having ordinary skill in the art in light of Geva’s teaching that its device “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. 1002 ¶ 78 (citing Ex. 1011, 1:16–18, 2:19–21).

Dr. Bederson further testifies that a person having ordinary skill in the art would have made the proposed combination “for the added benefits of Geva” such as “low power consumption,” “immun[ity] to noise,” and that Geva’s device “does not produce radio frequency interference (RFI) noise.” *Id.* (citing Ex. 1011, 2:37–39).

Petitioner’s assertions and Dr. Bederson’s testimony are supported sufficiently at this juncture by the cited portions of the asserted prior art. Also, at this juncture, we are persuaded that Petitioner has 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 proposed. After consideration of the assertions and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently that the combination of Keely and Geva teaches element 1[C] of claim 1 for purposes of institution.

*f) Element 1[D]: “a processing unit configured to:” and Element 1[E] “receive an output signal from the sensor array;”*

Petitioner asserts that Keely teaches element 1[D] based on Keely’s incorporation by reference of U.S. Patent 6,756,970 B2. Pet. 26–27 (citing Ex. 1006, 1:5–9; Ex. 1015, 3:64–67). U.S. Patent 6,756,970 B2 describes “[i]n the notepad-type preferred embodiment, a system electronics layer 24 up to ½ inch thick includes the remaining components of a notepad computer such as a processor, memory, modem, etc.” Ex. 1015, 3:64–67.

Regarding reasoning to combine the teachings of Keely and Geva related to limitation 1[E], Petitioner asserts the following:

It would have been obvious to a POSITA<sup>[5]</sup> to use Keely's processing unit for communication with the sensor array in view of the teachings of Geva. Ex-1002 ¶¶81–82. Specifically, Geva's "processing device 16 e.g. a microprocessor" (indicated in yellow) with "intensity/distance computation function 17" is operably coupled to the light sensor to receive "signals [transmitted] from each light sensing element in the light sensor arrays 12 and 28."

Pet. 24 (citing Ex. 1011, 5:18–21, 9:14–21).

Dr. Bederson testifies that a person having ordinary skill in the art would have used Keely's processing unit for communication with the sensor array. Ex. 1002 ¶ 81. Dr. Bederson testifies that a person having ordinary skill in the art would have been motivated to make the proposed modification "to achieve cost and power usage savings, as microprocessors are general purpose programmable devices." *Id.* ¶ 82.

Petitioner's assertions and Dr. Bederson's testimony are supported sufficiently at this juncture by the cited portions of the asserted prior art. Also, at this juncture, we are persuaded that Petitioner has 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 proposed. After consideration of the assertions and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently that the combination of Keely and Geva teaches elements 1[D] and 1[E] of claim 1 for purposes of institution.

g) *Element 1[F]: "determine the output signal from the sensor array corresponds to a distribution pattern of electromagnetic radiation;"*

Petitioner asserts that the combination of Keely and Geva teaches element 1[F] and cites as supporting evidence the testimony of Dr.

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<sup>5</sup> POSITA is person of ordinary skill in the art.

Bederson. Pet. 28–29 (citing Ex. 1002 ¶¶ 83–85). Petitioner cites as further supporting argument and evidence its contentions and evidence provided for the preamble and elements 1[C], 1[D], and 1[E]. *Id.*

Petitioner relies on Geva’s teachings relating to intensity/distance computation function 17 determining which light sensing elements receive the highest intensity. Pet. 28–29 (citing Ex. 1011, 9:17–21). Geva teaches “[e]ach light sensing element 11, 13, 31 and 33 within the light sensor arrays 12 and 28 provides signals responsive to light incident thereon” and “[s]ignals from each light sensing element in the light sensor arrays 12 and 28 are transmitted to the processing device 16.” Ex. 1011, 9:14–17. Geva further teaches “[t]he intensity/distance computation function 17 of the processing device 16 determines which light sensing elements receive the highest intensity of incident light incident and thereby the two-dimensional position of the light emitting cursor device 10” is determined. *Id.* at 9:17–21.

Dr. Bederson testifies “[t]his distribution pattern is illustrated in the one-dimensional example in Figure 3.” Ex. 1002 ¶ 84 (citing Ex. 1011, 4:25–26). Dr. Bederson testifies that a person having ordinary skill in the art “would have understood that the signals provided by Geva’s light sensor arrays correspond to a distribution pattern of electromagnetic radiation because the signals correspond to the ‘light beam’ emitted from Geva’s stylus and received by the light sensors.” *Id.* ¶ 85.

Petitioner’s assertions and Dr. Bederson’s testimony are supported sufficiently at this juncture by the cited portions of the asserted prior art. After consideration of the assertions and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently that Keely teaches element 1[F] of claim 1 for purposes of institution.

- h) Element 1[G]: “determine a three-dimensional position of the stylus relative to the interactive device based on the distribution pattern;”*

Petitioner asserts that the combination of Keely and Geva teaches element 1[G] and cites as supporting evidence the testimony of Dr. Bederson. Pet. 29–31 (citing Ex. 1002 ¶¶ 86–89). Petitioner cites as further supporting argument and evidence its contentions and evidence regarding Keely’s teachings provided for elements 1[C], 1[D], and 1[E]. *Id.* Petitioner asserts that Keely “requires determining a three-dimensional position, but leaves the implementation details” to a person having ordinary skill in the art. *Id.* at 30 (citing Ex. 1002 ¶ 86).

Petitioner relies on Geva’s teachings relating to determining the two-dimensional position of light emitting cursor device 10 and calculating the position of the light emitting cursor device 10 in a third, “z” dimension. *Id.* (citing Ex. 1011, 9:17–21, 9:23–31, 9:35–10:6). As discussed with respect to element 1[F] (*see supra* § III.D.3.g), Geva teaches determining “the two-dimensional position of the light emitting cursor device 10” based on a determination of “which light sensing elements receive the highest intensity of incident light.” Ex. 1011, 9:17–21. Geva also teaches

In 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 10 in a third, ‘z’, dimension. The third ‘z’ dimension is perpendicular to the first ‘x’ dimension and to the second ‘y’ dimension. The intensity/distance computation function 17 of the processing device 16 calculates the position of the light emitting cursor device 10 according to the intensity of light incident on the first and second light sensor arrays 28 and 30 as shown in FIG. 7.

*Id.* at 9:23–31. Geva further teaches “[i]n operation the light intensity measured by the intensity/distance computation function 17 in the two-

dimensional plane of FIG. 6 is used to determine the position of the light emitting cursor device 10 in the third, ‘z’ dimension.” *Id.* at 10:3–6.

Petitioner also provides reasoning to combine and cites as supporting evidence the testimony of Dr. Bederson. Pet. 29–31 (citing Ex. 1002 ¶¶ 86–89). Dr. Bederson testifies that a person having ordinary skill in the art “would have combined Keely’s display plane with the sensor array and processor of Geva in order to collect the positional input for ‘interacting’ with electronic documents.” Ex. 1002 ¶ 86. Dr. Bederson testifies 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 distribution pattern, as taught by Geva, into Keely’s notepad computer because Keely considers the pen’s three-dimensional position in displaying tool options and selection.” *Id.* ¶ 89.

Petitioner’s assertions and Dr. Bederson’s testimony are supported sufficiently at this juncture by the cited portions of the asserted prior art. Also, at this juncture, we are persuaded that Petitioner has 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 proposed. After consideration of the assertions and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently that the combination of Keely and Geva teaches element 1[G] of claim 1 for purposes of institution.

- i) *Element 1[H]: “determine the three-dimensional position of the stylus corresponds to a first selectable icon of the one or more selectable icons based on the output signal;”*

Petitioner asserts that Keely teaches “selectable icons” recited in element 1[H]. Pet. 31–33 (citing Ex. 1006, 2:23–51, 4:18–21, 6:3–15,

12:47–48, Figs. 6, 9). Petitioner relies on Keely’s teaching of “a pen-based interface with a ‘tool region’ where ‘tool icons’ are partially visible until the ‘pen is brought near one of the icons, at which time [the tools] become[] fully visible.’” *Id.* (citing Ex. 1006, 2:26–31). Petitioner also relies on (Pet. 32) Keely’s “core task tools,” which are “easily recognizable by using an icon that a user will recognize as related to the task,” such as “cup 62 of writing instruments.” Ex. 1006, 5:14–19.

In the portions of Keely relied on in the Petition, Keely teaches that process 100 “involves obtaining the pen location from the digitizer grid control process of the computer and determining 104 whether the pen is within a predetermined threshold distances of or in the region 16.” Ex. 1006, 6:3–7. If the bringing forward of the tool has not started and the tool is partially visible, process 100 checks if the pen has been pulled away or outside of the proximity of the tool. *Id.* at 6:11–13 (steps 106 and 108 of Figure 9). If, instead, “the pen is still up and over the tool 110,” the bringing forward of the tool starts 112 “resulting in a display as in FIG. 6,” which illustrates a fully visible tool. *Id.* at 2:67, 6:13–15.

Petitioner also cites as supporting evidence the testimony of Dr. Bederson. Pet. 31–33 (citing Ex. 1002 ¶¶ 90–91). Dr. Bederson testifies a person having ordinary skill in the art “would have understood that Keely determines the three-dimensional position of the stylus corresponding to a first selectable icon from among selectable icons by the user putting the pen down on the highlighted tool and then pulling it away again.” Ex. 1002 ¶ 91.

Petitioner’s assertions and Dr. Bederson’s testimony are supported sufficiently at this juncture by the cited portions of the asserted prior art. After consideration of the assertions and the evidence of record at this early

stage, we determine that Petitioner has shown sufficiently that Keely teaches element 1[H] of claim 1 for purposes of institution.

j) *Element 1[I]: “determine at least a portion of the output signal corresponds to a selection function associated with the first selectable icon”*

Petitioner asserts that the combination of Keely and Geva teaches element 1[I] and cites as supporting evidence the testimony of Dr. Bederson. Pet. 33–34 (citing Ex. 1002 ¶ 92). Petitioner cites as further supporting argument and evidence its contentions and evidence provided for elements 1[F], 1[G], and 1[H]. *Id.* Petitioner asserts “[a]s explained above, Geva’s light emitting stylus outputs a signal and determines a position based on at least a portion of the electromagnetic radiation beam.” *Id.*

Petitioner asserts

Keely discloses core task tools as selectable icons with unique functions that become fully visible when the stylus/pen is brought over the tool. Keely explains that the tools are selected “directly from the tip of the pen,” in that the “location of the pen tip over an icon will select the tool.” Ex-1006, 5:34-36. If the pen is put down on the highlighted tool 114 and then pulled away 120, the tool process associated with the tool icon is started 122 (green) as shown in Figure 9 above. Ex-1006, 6:19-23.

*Id.* Dr. Bederson testifies that a person having ordinary skill in the art “would have recognized that Keely’s selection function associated with the first selectable icon (i.e., the selected tool) corresponds to the output signal of the pen’s position, when it is raised from the display.” Ex. 1002 ¶ 92.

Petitioner’s assertions and Dr. Bederson’s testimony are supported sufficiently at this juncture by the cited portions of the asserted prior art. Also, at this juncture, we are persuaded that Petitioner has 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

proposed. After consideration of the assertions and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently that the combination of Keely and Geva teaches element 1[I] of claim 1 for purposes of institution.

k) *Element 1[J]: “execute, based on the selection function, a function related to the first selectable icon.”*

Petitioner asserts that the Keely teaches element 1[J]. Pet. 34. Petitioner cites as supporting argument and evidence its contentions and evidence provided for elements 1[H] and 1[I]. *Id.* Petitioner asserts “[a]s explained above, Keely discloses that its task icon’s unique functions are activated when selected.” *Id.* 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 asserts that Keely teaches “a function related to the first selectable icon” recited in element 1[J] based on Keely’s teachings relating to “tools such as ‘write,’ ‘type,’ ‘select,’ ‘new,’ ‘flag,’ ‘find,’ ‘send,’ and ‘dog-ear.’” Pet. 34 (citing Ex. 1006, 5:46–6:2). 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.

Petitioner’s assertions are supported sufficiently at this juncture by the cited portions of the asserted prior art. Also, at this juncture, we are persuaded that Petitioner has 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 proposed. After consideration of the assertions and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently that the combination of Keely and Geva teaches element 1[J] of claim 1 for purposes of institution.

*l) Conclusion*

After consideration of the contentions and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently, for purposes of institution, that the combination of Keely and Geva teaches each recitation of claim 1. Also, at this juncture, we are persuaded that Petitioner has 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 demonstrated a reasonable likelihood that it would prevail in showing that claim 1 is unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Keely and Geva.

*4. Independent Claims 10 and 16*

Independent claims 10 and 16 are similar to independent claim 1. Petitioner accounts for all differences in the claims. For instance, the preamble of independent claim 16 recites “[a] method for interacting with a mobile device.” Petitioner relies on Keely’s teaching that it is “directed to a notepad or notebook computer interface that facilitates input via a pen.” Pet. 20 (quoting Ex. 1006, 1:12–14). Dr. Bederson testifies that a person having ordinary skill in the art “would have understood that Keely’s pen-based

‘notepad’ computer system” is “a mobile device because such notepad or tablet computing devices were designed to be mobile.” Ex. 1002 ¶ 72.

After consideration of the contentions and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently that the combination of Keely and Geva teaches each recitation of independent claims 10 and 16 for purposes of institution. Also, at this juncture, we are persuaded that Petitioner has 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 the claims.

Accordingly, we conclude that Petitioner has demonstrated a reasonable likelihood that it would prevail in showing that claims 10 and 16 are unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Keely and Geva.

#### 5. *Dependent Claims 2 and 13*

Claim 2 recites “[t]he interactive device of claim 1, wherein the processing unit is further configured to: determine the stylus is in proximity to the interactive device when the distribution pattern exceeds a threshold.” Claim 13 recites “[t]he interactive system of claim 10, wherein the processing unit is further configured to: determine the stylus is in proximity to the interactive device when the portion of the beam of radiation exceeds a threshold.”

Petitioner asserts that the combination of Keely and Geva teaches the further recitations in dependent claims 2 and 13 and cites as supporting evidence the testimony of Dr. Bederson. Pet. 35–38 (citing Ex. 1002 ¶¶ 94–97). Petitioner relies on Keely’s teaching of determining “whether the pen is over or within a predetermined threshold distance or region of an object” on the interface. *Id.* at 35 (quoting Ex. 1006, 4:14–22). Petitioner also relies on

Keely's teaching that this "includes the pen being in the air above the display and not touching the display." *Id.* (quoting Ex. 1006, 6:3–8).

Petitioner asserts that "Geva discloses determining that the pen is in proximity to the interactive device when the distribution pattern exceeds a threshold." *Id.* (citing Ex. 1002 ¶ 95). Petitioner relies on Geva's teachings relating to its intensity/distance computation function 17 and calculating the position of light emitting cursor device 10. *Id.* at 35 (citing Ex. 1011, 6:12–14, 9:8–11, 9:22–31, 10:3–6, Figs. 3, 6, 7). As discussed with respect to element 1[G] (*see supra* § III.D.3.h), Geva teaches "calculating the position of the light emitting cursor device 10 in a third, 'z', dimension," which is "perpendicular to the first 'x' dimension and to the second 'y' dimension." Ex. 1011, 9:23–27. The position is calculated "according to the intensity of light incident on the first and second light sensor arrays 28 and 30." *Id.* at 9:28–31.

Dr. Bederson testifies that Geva's sensors "use intensity profiles" and that a person having ordinary skill in the art "would have understood that such an intensity profile is an example of a 'distribution pattern' as claimed." Ex. 1002 ¶ 96. Dr. Bederson testifies "[s]ince Keely teaches to use a 'predetermined threshold' Z-distance, a POSITA would have understood that this would have been done by applying a predetermined threshold to the measured intensity values, since that corresponds to Z-proximity." *Id.* ¶ 97.

Petitioner's assertions and Dr. Bederson's testimony are supported sufficiently at this juncture by the cited portions of the asserted prior art. After consideration of the contentions and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently that Keely teaches the further recitations in claims 2 and 13 for purposes of institution. Also, at this juncture, we are persuaded that Petitioner has 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 the claims.

Accordingly, we conclude that Petitioner has demonstrated a reasonable likelihood that it would prevail in showing that claims 2 and 13 are unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Keely and Geva.

6. *Dependent Claims 3, 14, and 17*

Claim 3 recites “[t]he interactive device of claim 1 wherein the display screen is configured to display a cursor corresponding to the three-dimensional position of the stylus.” Claim 14 recites “[t]he interactive device of claim 10, wherein the display screen is configured to display a cursor corresponding to the three-dimensional position of the stylus.” Claim 17 recites “[t]he method of claim 16, further comprising: displaying, by the display screen, a cursor proximate to the three-dimensional position of the stylus.”

Petitioner asserts that the combination of Keely and Geva teaches the further recitations in dependent claims 3, 14, and 17 and cites as supporting evidence the testimony of Dr. Bederson. Pet. 39–40 (citing Ex. 1002 ¶¶ 98–99). Petitioner cites as further supporting argument and evidence its contentions and evidence provided for elements 1[G] and 1[H]. *Id.*

Petitioner relies on Keely’s teachings relating to its cursor and determining the position of the pen. *Id.* at 39 (citing Ex. 1006, 6:3–9, 11:14–29, 11:40–45, Fig. 36). For instance, Petitioner relies on (*id.*) Keely’s teaching that “cursor 368 can be moved across the line by dragging it with the pen to point to text that needs to be edits or corrected.” Ex. 1006, 11:40–44. Dr. Bederson testifies that a person having ordinary skill in the art

“would have understood that Keely thus displays a cursor corresponding to the position of the stylus, including its three-dimensional position above the display.” Ex. 1002 ¶ 98.

Petitioner’s assertions and Dr. Bederson’s testimony are supported sufficiently at this juncture by the cited portions of the asserted prior art. After consideration of the contentions and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently that Keely teaches the further recitations in claims 3, 14, and 17 for purposes of institution. Also, at this juncture, we are persuaded that Petitioner has 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 the claims.

Accordingly, we conclude that Petitioner has demonstrated a reasonable likelihood that it would prevail in showing that claims 3, 14, and 17 are unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Keely and Geva.

#### 7. *Dependent Claim 4*

Claim 4 recites “[t]he interactive device of claim 3, wherein the display screen is further configured to move the position of the cursor based on movement of the stylus.” Petitioner asserts that the combination of Keely and Geva teaches the further recitations in dependent claim 4 and cites as supporting evidence the testimony of Dr. Bederson. Pet. 40 (citing Ex. 1002 ¶ 100). Petitioner relies on its contentions and evidence provided for dependent claims 3, 14, and 17. *Id.* For instance, Petitioner relies on (*id.*) Keely’s teaching that “cursor 368 can be moved across the line by dragging it with the pen to point to text that needs to be edits or corrected.” Ex. 1006, 11:40–44.

Petitioner's assertions and Dr. Bederson's testimony are supported sufficiently at this juncture by the cited portions of the asserted prior art. After consideration of the contentions and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently that Keely teaches the further recitation in claim 4 for purposes of institution. Also, at this juncture, we are persuaded that Petitioner has 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 the claim.

Accordingly, we conclude that Petitioner has demonstrated a reasonable likelihood that it would prevail in showing that claim 4 is unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Keely and Geva.

8. *Dependent Claims 5 and 15*

Claim 5 recites "[t]he interactive device of claim 3, wherein the display screen is further configured to display a menu of additional selectable icons proximate to the cursor." Claim 15 recites "[t]he interactive system of claim 14, wherein the display screen is further configured to display a menu of additional selectable icons proximate to the stylus."

Petitioner asserts that the combination of Keely and Geva teaches the further recitations in dependent claims 5 and 15 and cites as supporting evidence the testimony of Dr. Bederson. Pet. 41 (citing Ex. 1002 ¶ 101). Petitioner cites as further supporting argument and evidence its contentions and evidence provided for element 1[B] and dependent claims 3, 14, and 17. *Id.*

Petitioner relies on Keely's teachings relating to its color palette menu. *Id.* (citing, e.g., Ex. 1006, 6:25–28, 6:31–58, 6:66–7:3, Figs. 10, 11). One of Keely's teachings relied on by Petitioner is reproduced below.

One of the types of tools available in the interface is commonly called a radial marking, pop-up menu. In such a menu the selection of the menu item is governed by the direction of a stroke across the display generally from a vicinity where the icon is located.

Ex. 1006, 6:24–28. Petitioner also relies on (Pet. 41) Keely's teaching of "color palette selection radial marking menu 130 which allows the user to select from among five ink colors." Ex. 1006, 6:31–35.

Dr. Bederson testifies as follows:

A POSITA would have understood that Keely's menu items 132–140 are or include additional selectable icons proximate to the cursor because Keely teaches selectable objects and interface elements representing a process and displaying a cursor at the pen's location. *See* Sections XIV.A.2.c, 3.b. As I described above, POSITAs would have found it obvious to include additional selectable icons in a menu. *See* Section XII.C. Moreover, Keely's specific color options in the color submenu are selectable by orienting the pen in the direction of the desired color.

Ex. 1002 ¶ 101.

Petitioner's assertions and Dr. Bederson's testimony are supported sufficiently at this juncture by the cited portions of the asserted prior art. After consideration of the contentions and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently that Keely teaches the further recitations in claims 5 and 15 for purposes of institution. Also, at this juncture, we are persuaded that Petitioner has 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 the claims.

Accordingly, we conclude that Petitioner has demonstrated a reasonable likelihood that it would prevail in showing that claims 5 and 15 are unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Keely and Geva.

#### 9. *Dependent Claim 6*

Claim 6 recites “[t]he interactive device of claim 1, wherein at least one dimension of the three-dimensional position corresponds to a distance between the stylus and the interactive device.” Petitioner asserts that the combination of Keely and Geva teaches the further recitations in dependent claim 6 and cites as supporting evidence the testimony of Dr. Bederson. Pet. 42–43 (citing Ex. 1002 ¶¶ 102–104). Petitioner cites as further supporting argument and evidence its contentions and evidence provided for elements 1[G] and 1[H]. *Id.*

Petitioner relies on Keely’s and Geva’s teachings relating to determining the position of the pen and light emitting cursor device, respectively. *Id.* (citing Ex. 1006, 4:34–35, 4:38–39, 6:3–9; Ex. 1011, 7:32–35, 9:23–31, 9:35–10:6, Fig. 7). For instance, Petitioner relies on Keely’s teaching of determining “whether the pen is within a predetermined threshold distance of or in the region 16,” which “includes the pen being in the air above the display and not touching the display.” *Id.* at 42 (quoting Ex. 1006, 6:3–9). Dr. Bederson testifies that a person having ordinary skill in the art “would have understood that this corresponds to a distance between the stylus and the interactive device.” Ex. 1002 ¶ 102.

Regarding Geva’s teachings, 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." *Id.* ¶ 103. Dr. Bederson testifies that a person having ordinary skill in the art "would have combined Geva's third dimension determination into Keely's pen-based notepad computer system for the same reasons as described above in regards to element 1[G]." *Id.* ¶ 104.

Petitioner's assertions and Dr. Bederson's testimony are supported sufficiently at this juncture by the cited portions of the asserted prior art. After consideration of the contentions and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently that Keely teaches the further recitation in claim 6 for purposes of institution. Also, at this juncture, we are persuaded that Petitioner has 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 the claim.

Accordingly, we conclude that Petitioner has demonstrated a reasonable likelihood that it would prevail in showing that claim 6 is unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Keely and Geva.

#### *10. Dependent Claim 8<sup>6</sup>*

Claim 8 recites "[t]he interactive device of claim 1, wherein the display screen is configured to display a cursor corresponding to a trajectory of the stylus." Petitioner asserts that the combination of Keely and Geva

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<sup>6</sup> Claim 8 is omitted from the sub-title on page 35 of the Petition. Petitioner, however, provides contentions demonstrating the unpatentability of claim 8 and includes claim 8 in Ground 1 on page 3 of the Petition. Pet. 3, 43–44. We treat Petitioner's omission on page 35 of the Petition as a typographical error.

teaches the further recitations in dependent claim 8 and cites as supporting evidence the testimony of Dr. Bederson. Pet. 43–44 (citing Ex. 1002 ¶ 105).

Petitioner cites as further supporting argument and evidence its contentions and evidence provided for and dependent claims 3, 4, 14, and 17. *Id.* For instance, Petitioner relies on (*id.*) Keely’s teaching that “cursor 368 can be moved across the line by dragging it with the pen to point to text that needs to be edits or corrected.” Ex. 1006, 11:40–44. Dr. Bederson testifies that a person having ordinary skill in the art “would have understood that Keely thus configures the cursor corresponding to the stylus’s trajectory by the cursor moving along with the pen’s path.” Ex. 1002 ¶ 105.

Petitioner’s assertions and Dr. Bederson’s testimony are supported sufficiently at this juncture by the cited portions of the asserted prior art. After consideration of the contentions and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently that Keely teaches the further recitation in claim 8 for purposes of institution. Also, at this juncture, we are persuaded that Petitioner has 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 the claim.

Accordingly, we conclude that Petitioner has demonstrated a reasonable likelihood that it would prevail in showing that claim 8 is unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Keely and Geva.

#### *11. Dependent Claims 9 and 12*

Claim 9 recites “[t]he interactive device of claim 1, wherein the sensor plane is substantially parallel to the touch-sensitive display plane.” Claim 12

recites “[t]he interactive system of claim 10, wherein the sensor array plane is substantially parallel to the display screen.” Petitioner asserts that the combination of Keely and Geva teaches the further recitations in dependent claims 9 and 12 and cites as supporting evidence the testimony of Dr. Bederson. Pet. 44 (citing Ex. 1002 ¶¶ 106–108). Petitioner relies on its contentions and evidence provided for element 1[B]. *Id.* Dr. Bederson testifies that a person having ordinary skill in the art would have understood that Geva’s sensor plane would be parallel to the display screen. Ex. 1002 ¶ 107.

Petitioner’s assertions and Dr. Bederson’s testimony are supported sufficiently at this juncture by the cited portions of the asserted prior art. After consideration of the contentions and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently that Keely teaches the further recitations in claims 9 and 12 for purposes of institution. Also, at this juncture, we are persuaded that Petitioner has 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 the claims.

Accordingly, we conclude that Petitioner has demonstrated a reasonable likelihood that it would prevail in showing that claims 9 and 12 are unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Keely and Geva.

#### *12. Dependent Claim 11*

Claim 11 depends from claim 1. Petitioner asserts that claim 11 is unpatentable as obvious over Keely and Geva. Pet. 45–48.

- a) *The Preamble—11[Pre] “The interactive device of claim 1, wherein the processing unit is further configured to”*

Petitioner relies on its contentions and evidence provided for elements 1[D] and 1[E]. Pet. 45. Petitioner’s assertions and Dr. Bederson’s testimony are supported sufficiently at this juncture by the cited portions of the asserted prior art. After consideration of the assertions and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently that the combination of Keely and Geva teaches the preamble of claim 11 for purposes of institution.

- b) *Element 11[A] “determine at least one of an area of the distribution pattern or an intensity of the portion of the beam of electromagnetic radiation incident on the display screen; and”*

Petitioner asserts that the combination of Keely and Geva teaches element 11[A] and cites as supporting evidence the testimony of Dr. Bederson. Pet. 45–47 (citing Ex. 1002 ¶¶ 110–112). Petitioner cites as further supporting argument and evidence its contentions and evidence provided for elements 1[B], 1[C], and 1[F], and dependent claims 2 and 13. *Id.*

Petitioner relies on Geva’s teachings relating to intensity/distance computation function 17 of processing device 16 and its calculation of the position of the light emitting cursor device 10. *Id.* at 46 (citing Ex. 1011, 2:33–36, 4:25–26, 9:17–21, 9:28–31, Fig. 3). In a portion of Geva relied on by Petitioner, Geva teaches “[t]he intensity/distance computation function 17 of the processing device 16 calculates the position of the light emitting cursor device 10 according to the intensity of light incident on the first and second light sensor arrays 28 and 30 as shown in FIG. 7.” Ex. 1011, 9:28–31.

Petitioner's assertions and Dr. Bederson's testimony are supported sufficiently at this juncture by the cited portions of the asserted prior art. After consideration of the assertions and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently that the combination of Keely and Geva teaches element 11[A] for purposes of institution.

*c) Element 11[B] “wherein, when the processor determines the three-dimensional position of the stylus, the processor further determines the three-dimensional position of the stylus relative to the interactive device based on at least one of the area of the distribution pattern or the intensity of the beam of electromagnetic radiation.”*

Petitioner asserts that the combination of Keely and Geva teaches element 11[B] and cites as supporting evidence the testimony of Dr. Bederson. Pet. 47–48 (citing Ex. 1002 ¶¶ 113–115). Petitioner cites as further supporting argument and evidence its contentions and evidence provided for elements 1[C], 1[D], 1[E], 1[G], and 11[A]. *Id.*

Petitioner relies on Geva's teachings relating to Geva's intensity/distance computation function 17 of processing device 16 and its calculation of the position of the light emitting cursor device 10. *Id.* at 47–48 (citing Ex. 1011, 9:17–21, 9:35–10:6, Fig. 7). In a portion of Geva relied on by Petitioner, Geva teaches that “[i]n operation the light intensity measured by the intensity/distance computation function 17 in the two-dimensional plane of FIG. 6 is used to determine the position of the light emitting cursor device 10 in the third, ‘z’ dimension.” Ex. 1011, 10:3–6. Dr. Bederson testifies that a person having ordinary skill in the art “would have been motivated to include determining the three-dimensional position of the stylus based on the intensity of the beam of electromagnetic radiation, as taught by Geva, into Keely's notepad computer because Keely considers the pen's

three-dimensional position in displaying tool options and selection.”

Ex. 1002 ¶ 115.

Petitioner’s assertions and Dr. Bederson’s testimony are supported sufficiently at this juncture by the cited portions of the asserted prior art. After consideration of the assertions and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently that the combination of Keely and Geva teaches element 11[B] for purposes of institution.

*d) Conclusion—Claim 11*

After consideration of the contentions and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently that the combination of Keely and Geva teaches each recitation of claim 11 for purposes of institution. Also, at this juncture, we are persuaded that Petitioner has 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 the claims.

Accordingly, we conclude that Petitioner has demonstrated a reasonable likelihood that it would prevail in showing that claim 11 is unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Keely and Geva.

*E. Unpatentability of Claims 7 and 18 under 35 U.S.C. § 103(a) as Obvious over Keely, Geva, and Kameyama*

Petitioner asserts that claims 7 and 18 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, below, illustrates irradiating light from a light generator of a three-dimensional pointing device in a conical shape on a photodetector. *Id.* at 14.<sup>7</sup>

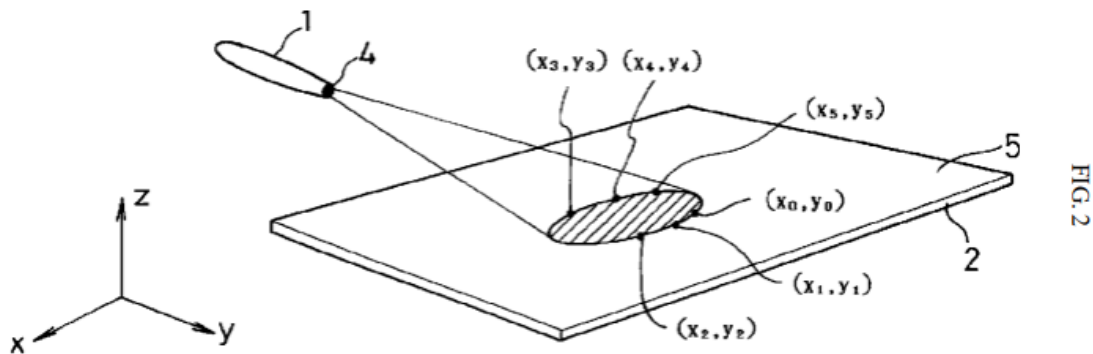


Figure 2, above, is a schematic diagram illustrating irradiating conical shaped light from light source 4 of light generator 1 from any position onto the light receiving surface 5 on which light receiving elements of photodetector 2 are arranged. *Id.* ¶ 19. Kameyama describes that a spatial position (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 7 and 18*

Claims 7 and 18 depend from claims 1 and 16, respectfully. Below we address Petitioner's contentions that claims 7 and 18 are unpatentable as obvious over Keely, Geva, and Kameyama.

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<sup>7</sup> This citation is to page 14 of Exhibit 1012, which does not include paragraph numbers.

*a) Reasoning to Combine*

Petitioner contends that Kameyama, like Keely and Geva, relates to pen-based computing. Pet. 49 (citing Ex. 1012 ¶ 1; Ex. 1002 ¶ 116). Petitioner contends that a person having ordinary skill in the art “would have been motivated to combine the teachings of Kameyama with the teachings of Keely and Geva” because “Kameyama further provides ‘a calculation process able to derive position and/or posture [of a light pen] in a 3D space of light. . . when light emitted by the light generating means irradiates a light receiving surface of light detecting means.” *Id.* (citing Ex. 1012 ¶ 9; Ex. 1006, 2:20–23; Ex. 1011, 1:6–9).

Petitioner also provides contentions regarding reasoning to combine in its element-by-element analysis. *Id.* at 50–54. We discuss Petitioner’s contentions below.

*b) The Preambles—7[Pre] “The interactive device of claim 1, wherein the processing unit is further configured to” and 18[Pre] “The method of claim 16, further comprising”*

Petitioner relies on its contentions and evidence provided for elements 1[D] and 1[E]. Pet. 50. Petitioner’s assertions and Dr. Bederson’s testimony are supported sufficiently at this juncture by the cited portions of the asserted prior art. After consideration of the assertions and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently that the combination of Keely, Geva, and Kameyama teaches the preambles of claims 7 and 18 for purposes of institution.

*c) Elements 7[A] “determine the distribution pattern indicates an elliptical eccentricity” and 18[A] “determining, by the processor, the distribution pattern indicates an elliptical eccentricity”*

Petitioner asserts that the combination of Keely, Geva, and Kameyama teaches elements 7[A] and 18[A] and cites as supporting

evidence the testimony of Dr. Bederson. Pet. 50–51 (citing Ex. 1002 ¶¶ 118–120). Petitioner cites as further supporting argument and evidence its contentions and evidence provided for element 1[F]. *Id.*

Petitioner also asserts that Kameyama “considers a ‘conical shaped light irradiated from the light source 4 of the [pen] onto the light receiving surface 5.’” *Id.* at 50 (citing Ex. 1012 ¶¶ 19, 25, Fig. 2). Petitioner relies on Kameyama’s teachings relating to deriving through a calculation process the position and posture data of light source 4 of light generator 1. Ex. 1012 ¶¶ 1, 47. Kameyama teaches that its process includes a formula for representing “a secondary curve illustrating an irradiation range formed on the light receiving surface 5 on which the light receiving elements are arranged.” Ex. 1012 ¶ 19. Dr. Bederson testifies “Kameyama teaches determining that the distribution pattern indicates an elliptical eccentricity.” Ex. 1002 ¶ 119.

Petitioner’s assertions and Dr. Bederson’s testimony are supported sufficiently at this juncture by the cited portions of the asserted prior art. After consideration of the assertions and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently that the combination of Keely, Geva, and Kameyama teaches elements 7[A] and 18[A] for purposes of institution.

*d) Elements 7[B] “determine an angle of the stylus relative to the display screen based on the elliptical eccentricity” and 18[B] “determining, by the processor, an angle of the stylus relative to the display screen based on the elliptical eccentricity”*

Petitioner asserts that the combination of Keely, Geva, and Kameyama teaches elements 7[B] and 18[B] and cites as supporting evidence the testimony of Dr. Bederson. Pet. 51–53 (citing Ex. 1002 ¶¶ 121–123). Petitioner relies on Keely’s teachings relating to determining

orientation of the pen. *Id.* at 51–52 (citing Ex. 1006, 1:42–44, 2:20–22, 6:59–65, 7:15–17, 11:40–45). In the portions of Keely relied on by Petitioner, Keely teaches “[i]t is another object of the present invention to provide a system where both the location and orientation of the pen act to determine its function.” Ex. 1006, 2:20–22. Also, Keely teaches display of right-handed or left-handed versions of a menu “by determining the orientation of the pen in the user’s hand during writing when the pen is in a normal orientation for the user.” *Id.* at 7:15–17.

Petitioner also relies on Kameyama’s teachings relating to deriving through a calculation process the position and posture data of light source 4 of light generator 1. Pet. 52 (citing Ex. 1012 ¶¶ 19, 20, 31, 47, Figs. 1, 2, 3, 4). Petitioner asserts that Kameyama teaches a formula that “determines ‘an angle [] with respect to the light receiving surface of the photodetector 2 of the light source 4 of the light generator 1.’” *Id.* (citing Ex. 1012 ¶ 31, Figs. 1, 3, 4). Dr. Bederson testifies that a person having ordinary skill in the art “would have understood that Kameyama would determine the orientation of said input object based on the light spot’s elliptical eccentricity by using the formulas provided in Kameyama and would have been motivated to make this determination to provide for additional user interface features.” Ex. 1002 ¶ 123.

Petitioner’s assertions and Dr. Bederson’s testimony are supported sufficiently at this juncture by the cited portions of the asserted prior art. After consideration of the assertions and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently that the combination of Keely, Geva, and Kameyama teaches elements 7[B] and 18[B] for purposes of institution.

*e) Element 18[C] “displaying a cursor on the display screen based on the angle of the stylus”*

Petitioner asserts that the combination of Keely, Geva, and Kameyama teaches element 18[C] and cites as supporting evidence the testimony of Dr. Bederson. Pet. 53–54 (Ex. 1002 ¶¶ 124–125). Petitioner cites as further supporting argument and evidence its contentions and evidence provided for elements 7[A] and 7[B] and dependent claims 3, 14, and 17. *Id.*

For instance, Petitioner relies on Keely’s teachings relating to determining orientation of the pen. *Id.* at 53–54 (citing Ex. 1006, 1:42–44, 6:59–65, 7:15–17). In the portions of Keely relied on by Petitioner, Keely teaches display of a right-handed or left-handed version of a menu “by determining the orientation of the pen in the user’s hand during writing when the pen is in a normal orientation for the user.” Ex. 1006, 7:15–17. Dr. Bederson testifies that a person having ordinary skill in the art “would have understood that Keely thus displays the cursor based on the angle of how the user is holding the stylus.” Ex. 1002 ¶ 124.

Petitioner also relies on Kameyama’s teachings relating to deriving through a calculation process the position and posture data of light source 4 of light generator 1. Pet. 54 (citing Ex. 1012 ¶¶ 20, 31, 47). In one of the portions of Kameyama relied on by Petitioner, Kameyama teaches deriving “an angle ( $\theta$ ) with respect to the light receiving surface of the photodetector 2 of the light source 4 of the light generator 1, and an angle ( $\psi$ ) in the light receiving surface of the photodetector 2 of the light source 4 of the light generator 1.” Ex. 1012 ¶ 31. Dr. Bederson testifies that a person having ordinary skill in the art “would have understood that [Kameyama’s

“position and posture data’ output to a computer would be used for additional user interface features.” Ex. 1002 ¶ 125.

Petitioner’s assertions and Dr. Bederson’s testimony are supported sufficiently at this juncture by the cited portions of the asserted prior art. After consideration of the assertions and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently that the combination of Keely, Geva, and Kameyama teaches element 18[C] for purposes of institution.

*f) Conclusion*

We have considered Petitioner’s arguments and evidence for dependent claims 7 and 18 and are persuaded that Petitioner has shown sufficiently that the combination of Keely, Geva, and Kameyama teaches the further recitations in each of those dependent claims. Also, at this juncture, we are persuaded that Petitioner has articulated reasoning with a rational underpinning as to why one of ordinary skill in the art would have combined the teachings of Keely, Geva, and Kameyama in the manner recited in claims 7 and 18.

After consideration of the contentions and the evidence of record at this juncture, we conclude that Petitioner has demonstrated a reasonable likelihood that it would prevail in showing that claims 7 and 18 are unpatentable under 35 U.S.C. § 103(a) over the combination of Keely, Geva, and Kameyama.

IV. CONCLUSION

For the foregoing reasons, we conclude that the information presented in the Petition establishes a reasonable likelihood that Petitioner would prevail in showing that claims 1–18 of the ’070 patent are unpatentable.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that *inter partes* review of claims 1–18 of the '070 patent is hereby instituted on all grounds stated in the Petition; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial; the trial will commence on the entry date of this decision.

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Patent 10,664,070 B2

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