

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

**AMAZON.COM, INC.,
AMAZON.COM SERVICES LLC, and
AMAZON WEB SERVICES, INC.,**
Petitioners,

v.

SOUNDCLEAR TECHNOLOGIES, LLC,
Patent Owner.

IPR2025-01368
U.S. Patent No. 9,223,487

**PETITION FOR *INTER PARTES* REVIEW OF
CLAIMS 1-3 AND 10-12 OF U.S. PATENT NO. 9,223,487**

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TABLE OF EXHIBITS

Exhibit No.	Description
1001	U.S. Patent No. 9,223,487 (“the ’487 patent”)
1002	Declaration of Craig Rosenberg, Ph.D.
1003	U.S. Patent Publ. No. 2010/0090971 (“Choi”)
1004	European Patent No. 2,175,354 (“Yach”)
1005	U.S. Patent Publ. No. 2008/0309632 (“Westerman-632”)
1006	U.S. Patent Publ. No. 2006/0274046 (“Hillis”)
1007	U.S. Patent Publ. No. 2011/0077851 (“Ogawa”)
1008	PCT Publ. No. WO 2010/091496 (“McGibney”)
1009	U.S. Patent Publ. No. 2011/0074718 (“Yeh”)
1010	U.S. Patent Publ. No. 2010/0235793 (“Ording”)
1011	U.S. Patent Publ. No. 2008/0036743 (“Westerman-743”)
1012	U.S. Patent No. 7,256,773 (“Kolmykov-Zotov”)
1013	U.S. Patent Publ. No. 2009/0153492 (“Popp”)
1014	U.S. Patent Publ. No. 2012/0180003 (“Sawayanagi”)
1015	Excerpts from the ’487 patent’s file history
1016	CV of Craig Rosenberg, Ph.D.

Amazon.com, Inc., Amazon.com Services LLC, and Amazon Web Services, Inc. (collectively, “Petitioners” or “Amazon”) respectfully request *inter partes* review of claims 1-3 and 10-12 of U.S. Patent No. 9,223,487 (“the ’487 patent”), which SoundClear Technologies LLC (“Patent Owner” or “PO”) purportedly owns.

I. INTRODUCTION

The challenged claims recite using a common “pinching” gesture on a touchscreen device to perform a known function: selecting the objects inside a rectangle defined by the initial touch points. The “pinching” or “inward drag” gesture was well-known by the patent’s earliest possible priority date (in 2011), as was the idea of using that gesture to select objects on a screen.

The Examiner allowed the ’487 patent after the claims were amended to recite a calculation for detecting the inward drag gesture. But that calculation, too, was known. Had the Examiner been aware of references disclosing this calculation (such as Hillis, discussed below), the patent never would have issued.

The claims here merely combine a known method for detecting a pinching gesture (by analyzing the movement of the two touch points) with a known command (selecting objects within an area when a gesture is detected). Because this combination would have been obvious to a person of ordinary skill in the art in 2011, the Board should institute this IPR and cancel the challenged claims.

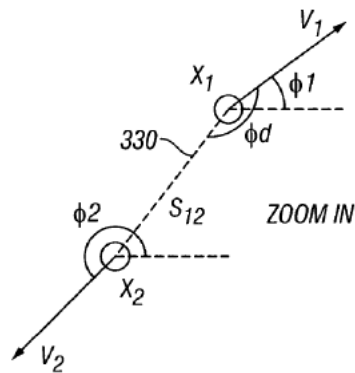
II. BACKGROUND AND STATE OF THE ART

A. Analyzing Vectors and Angles to Detect a Pinching Gesture Was Known.

By 2004, various methods for detecting multi-touch gestures on touchscreen devices were known. For example, Hillis (filed in 2004) described an “interactive display” controlled by “user gestures identified on a touch detecting display surface.” (EX-1006 ¶[0007].) Hillis explained that, when contact locations are detected, a computer program determines a velocity for each contact location. (*Id.* ¶[0007]-[0008], [0028]-[0029].) Based on the position and velocity information, gestures are identified. (*Id.*; *id.* ¶[0021].) The identified gestures are then associated with commands. (*Id.*; EX-1002 ¶43.)

Hillis disclosed that, when “a user establishes and moves two contact locations,” the “[v]elocities ... are determined for each of the contact points, including magnitudes and directions[.]” (EX-1006 ¶[0034].) These magnitudes and directions define “velocity vectors” (*id.* ¶[0036]) that extend from the first and second touch points at a first moment in time, respectively, to touch positions occurring at a later moment. (*Id.* ¶¶[0028]-[0029], [0031], [0035], Figs. 4-5; EX-1002 ¶44.)

Figure 5 of Hillis shows the first and second vectors, $\vec{v}_1$ and $\vec{v}_2$, for a gesture in which the two touch positions, $\vec{x}_1$ and $\vec{x}_2$, are spreading:

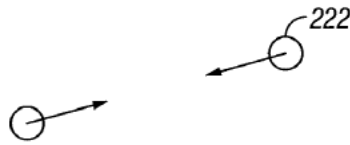


(EX-1006, Fig. 5.) To analyze the gesture, Hillis disclosed deriving “line segment S_{12} 330 connecting the positions $\vec{x}_1$ and $\vec{x}_2$.” (*Id.* ¶[0035]; EX-1002 ¶45.)

Hillis then analyzed the angles (ϕ_1 and ϕ_2) of each vector and compared them. If they are similar, the system identified the gesture as a “panning” movement of the display. (EX-1006 ¶[0034].)

If the angles are not similar, then “the angle ϕ_d between the line segment S_{12} 330 connecting the positions $\vec{x}_1$ and $\vec{x}_2$ and either of the two velocities is considered.” (*Id.* ¶[0035].) “If the line segment S_{12} and the velocity are found to be in approximate alignment,” the system identified the gesture as a zoom request. (*Id.*)

Figure 5 described a spreading motion (for a zoom-in command), but Hillis also disclosed that “an approaching motion of the two contact locations results in an outward zoom 222.” (*Id.* ¶[0031].) That gesture, analogous to a pinching gesture, is shown in Figure 4:



(*Id.*, Fig. 4.) Thus, Hillis disclosed a method of detecting when two touch points are “approaching” each other: derive a line between the two touch points, determine the vectors (magnitude and direction) of movement of each touch point, and then calculate the angle between the vector and the straight line. If the line segment and velocities are in “approximate alignment,” then the gesture is identified as a spreading or approaching gesture (analogous to reverse-pinching and pinching gestures). (*Id.* ¶[0035].) Then, the length of the line segment over time is considered. (*Id.*) If it is decreasing, then the touch points are approaching each other (e.g., a pinching gesture) and the gesture is identified as a request for a particular command associated with that gesture (e.g., an outward zoom). (EX-1002 ¶¶46-48.)

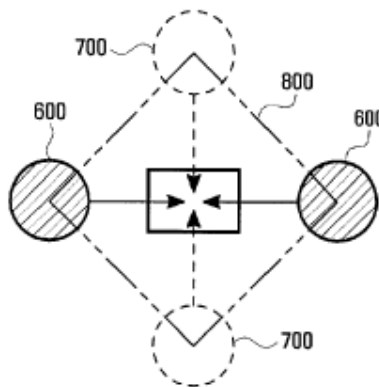
Hillis distinguished the spreading and approaching gestures from a situation in which the vectors are “approximately perpendicular to the line segment[.]” in which case the gesture is identified as a request to rotate the display. (EX-1006 ¶[0036]; EX-1002 ¶49.)

B. Pinch-to-Select Functions Were Known.

Hillis described using an approaching multi-touch gesture to perform a par-

ticular function—zooming out. This functionality became widely known with Apple’s launch of the iPhone in 2007. (EX-1002 ¶¶50.) But many references described using pinching gestures for various other commands. And, by 2011, using a pinching gesture to define an area on a touchscreen display and select objects within that area was known in the art and had been described in many references. (*Id.* (citing EX-1013).)

In 2009, Samsung filed a patent application describing a “touchscreen device” and methods of “handling objects displayed on the screen with diverse multi-touch gestures.” (EX-1003 (“Choi”), Abstract.) Choi disclosed that, when two initial touch points are detected and then an “inward drag event” occurs (e.g., a pinching gesture), the system draws “imaginary lines” to define a rectangular “pickup coverage area.” (*Id.* ¶¶[0189]-[0190].) The device then “selects the objects” “in the pickup coverage area.” (*Id.*) The touch points 600 and the rectangular area 800 are shown in Choi’s Figure 58:



(*Id.*, Fig. 58 (excerpt); *see also id.*, Figs. 59, 60.) Many other references disclosed

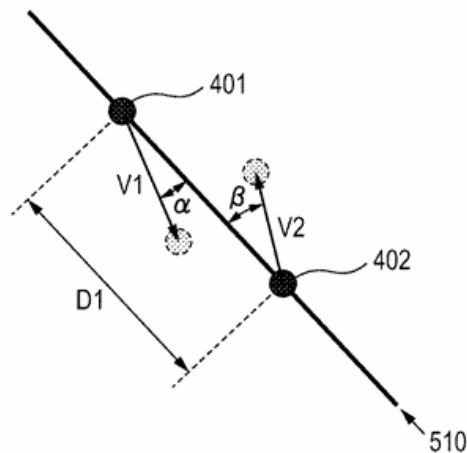
similar pinch-to-select functionality. (EX-1002 ¶51.)

III. THE '487 PATENT

A. Overview

The '487 patent describes detecting a pinching gesture on a generic touchscreen device and then, in response to the gesture, selecting objects in an area defined by the initial touch points. The patent admits that touchscreen devices were known and that various gestures were known for selecting objects. (EX-1001, 1:15-39, 6:18-21 (device may be “a smartphone” or personal computer), 8:9-15.) The '487 patent's purported advance over the prior art is to allow a user to “give a command for a process by easy operation.” (*Id.*, 1:48-56, 5:18-22.)

The patent describes a method for detecting a pinch gesture. First, the system detects two touch positions (401, 402) and calculates vectors (V1, V2) for each touch position, as shown in Figure 5:



(*Id.*, 9:51-66, Fig. 5.)

The system then determines whether the touch positions are approaching each other. (*Id.*, 9:51-66.) To do so, the system: (a) derives a straight line 510 between the initial touch points; (b) calculates the angles (α , β) between the straight line and each vector; and (c) compares those angles to a prescribed angle. (*Id.*, 10:5-13.) If both angles are smaller than the prescribed angle and the distance between the touch points (D1) decreases over time, then the two touch points are considered to be “approaching each other” (e.g., pinching motion).

When a pinching motion is detected, a known command results: the system sets a rectangular area as shown in Figure 4C, where the initial touch points (401, 402) represent opposite corners of the rectangle. (*Id.*, 10:40-48; *see also id.*, 10:49-53.) Objects within the area (e.g., icons 310A-C) are selected. (*Id.*, 10:54-60.)

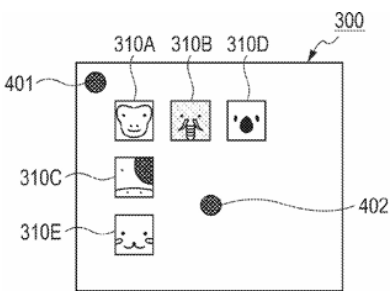


Fig. 4A

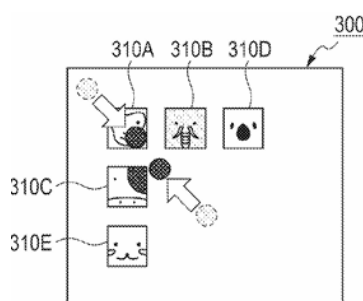


Fig. 4B

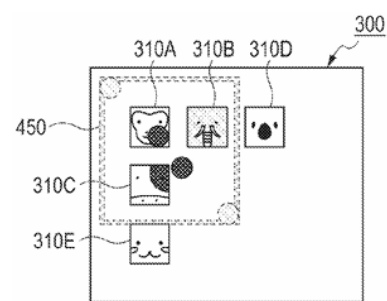


Fig. 4C

(*Id.*, Figs. 4A-4C; EX-1002 ¶¶52-55.)

B. Prosecution

The Examiner initially rejected all independent claims as obvious. (EX-1015, 213.) In response to a final office action (*id.*, 45), the applicant amended the claims

to recite limitations requiring the determination of the angles of the vectors relative to the line between the touch points (*id.*, 31-39). Although these calculations were known in the art, the Examiner allowed the claims.

C. Priority

The '487 patent's earliest possible priority date is September 28, 2011. (EX-1001, 1.) Petitioners do not concede that the claims are entitled to that priority date.

IV. LEVEL OF ORDINARY SKILL IN THE ART

A person of ordinary skill in the art ("POSITA") would have had a minimum of a bachelor's degree in computer engineering, computer science, user interface design, human factors, electrical engineering, mechanical engineering, or a similar field, and approximately three years of industry or academic experience in a field related to computer gestures and commands. (EX-1002 ¶¶37-41); *see In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). Work experience could substitute for formal education and additional formal education could substitute for work experience. (*Id.*)

V. CLAIM CONSTRUCTION

No claim terms require construction to resolve the obviousness challenges here. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Ltd.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017); *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795,

803 (Fed. Cir. 1999). For purposes of this proceeding only, Petitioners assume the claims are not invalid under §112.

VI. STATEMENT OF PRECISE RELIEF REQUESTED

A. Grounds

The Board should cancel the claims under 35 U.S.C. §103 on the following Grounds:

Ground	Challenged Claims	References
1a	1, 11, and 12	Choi and Hillis
1b	2 and 3	Choi, Hillis, Ogawa, and optionally McGibney
1c	10	Choi, Hillis, Yeh, and Ording
2a	1, 11, and 12	Yach, Westerman-632, and Hillis
2b	2 and 3	Yach, Westerman-632, Hillis, Ogawa, and optionally McGibney
2c	10	Yach, Westerman-632, Hillis, Yeh, and Ording

Additional support is included in the Declaration of Craig Rosenberg, Ph.D. (EX-1002.)

B. Status of References as Prior Art

The following references are prior art under at least pre-AIA 35 U.S.C. §102(b) because they published more than a year before the '487 patent's earliest possible priority date:

- (1) Choi (EX-1003), published April 15, 2010;
- (2) Yach (EX-1004), published April 14, 2010;
- (3) Hillis (EX-1006), published December 7, 2006;
- (4) Westerman-632 (EX-1005), published December 18, 2008;
- (5) McGibney (EX-1008), published August 19, 2010; and
- (6) Ording (EX-1010), published September 16, 2010.

Ogawa (EX-1007) was filed on August 6, 2010 and published March 31, 2011, and Yeh (EX-1009) was filed on September 28, 2010 and published March 31, 2011, and therefore both are prior art under at least §102(a).

The references above are analogous art because they are from the same field of endeavor as the '487 patent, e.g., computer gestures and commands. (EX-1002 ¶32; EX-1001, 1:15-17; *Unwired Planet, LLC v. Google Inc.*, 841 F.3d 995, 1000 (Fed. Cir. 2016). They are also pertinent to a problem the inventor was focused on, e.g., identifying and simplifying touch commands. (EX-1001, 1:35-44; EX-1002 ¶32.)

VII. GROUND 1A: CLAIMS 1, 11, AND 12 WOULD HAVE BEEN OBVIOUS OVER CHOI AND HILLIS.

A. Claim 1

The preamble of claim 1 recites “[an] electronic apparatus[.]” Choi discloses this. (EX-1003, Abstract (“touchscreen-enabled device”), ¶¶[0003] (invention

“relates to virtually any electronic device having a touchscreen display”), [0011] (“device equipped with a touchscreen that senses multi-touch input”), [0042] (“The present invention provides a device having a touchscreen that provides detection and recognition of touch gestures formed on the screen, and interpreting the touch event into a command such that that the user can move, delete, copy, and modify the objects displayed on the screen by means of the touchscreen.”); EX-1002 ¶56.)

The first five claim elements (elements 1[a]-1[e] below) recite known, conventional components of a generic touchscreen device, and therefore cannot make the claims patentable. (*See, e.g.*, EX-1001, 6:12-21 (The “electronic apparatus 100 may be a smartphone, a tablet-type terminal device with a touch panel, or a personal computer with a touch panel”); EX-1002 ¶57.) Nevertheless, Choi discloses these claim elements.

1. 1[a]: Display

Element 1[a] recites “a display.” Choi discloses that its electronic device includes a “display unit 2330” that “displays ... the applications running in the device[.]” (EX-1003 ¶[0230]; *id.* ¶¶[0222]-[0223] (invention can be applied to “all types of display device[s]”), [0231] (“the touchscreen is a display”), [0232].) Choi discloses that conventional touchscreen devices include a “display panel for displaying visual data[.]” (*Id.* ¶[0007].) Thus, Choi discloses this limitation. (EX-1002 ¶58.)

2. 1[b]: Indicating Section

Element 1[b] recites “an indicating section for indicating objects on the display.” Choi discloses indicating (e.g., displaying) objects on the display. (EX-1003, Abstract (“objects displayed on the screen”), ¶¶[0003], [0012], [0014], [0016], [0042], [0169], [0190]-[0191], Fig. 3.) Thus, Choi discloses this limitation. (EX-1002 ¶59.)

3. 1[c]: Touch Panel

Element 1[c] recites “a touch panel superposed on the display[.]” The ’487 patent admits that touch panels were well-known. (EX-1001, 1:19-23 (touch panels are widespread), 1:24-38; EX-1002 ¶60.) Moreover, Choi discloses that its touchscreen may include “a touch panel in front of the display unit 2330.” (EX-1003 ¶[0232]; *id.* ¶[0231] (display unit 2330 “can be implemented with a touchscreen[.]” which “is a display having a touch sensitive surface that can detect touch events”).) Choi also discloses that conventional touchscreen devices included a “touch panel” in front of the display screen. (*Id.* ¶[0007].) Thus, Choi discloses this limitation. (EX-1002 ¶60.)

4. 1[d]: Acquiring Section for Detecting Touches

Element 1[d] recites “an acquiring section for detecting user’s touches to the touch panel and acquiring positions of the user’s touches to the touch panel as touch positions[.]”

Choi discloses that the device can “detect touch events.” (EX-1003 ¶[0231].) Then, “if a touch event is detected ..., the touchscreen locates the position such that a software program performs an action in response to the touch event.” (*Id.*; *id.* ¶¶[0233] (“if the user makes a touch event at a specific position on the touchscreen, the touchscreen detects the position and sends position information to the control unit”), [0167] (the device “first detects a touch event (1301) and recognizes touch points (coordinates) made by the touch event (1303)”), [0188]-[0191] (describing identifying the location of touch points 600), Figs. 48 (step 1303 (“recognize touch points (coordinates)”), 58-60 (showing touch points 600).) Choi therefore discloses that its touch panel includes an acquiring section for detecting and locating a user’s touches, and thus discloses this limitation. (EX-1002 ¶¶61-62.)

5. 1[e]: Selecting Section

Claim 1 recites “a selecting section” that performs the operations recited in the remaining claim elements. Element 1[e] recites that the selecting section is “[i] for deciding whether or not first and second touch positions are acquired by the acquiring section, [ii] for calculating a distance between the first and second touch positions, and [iii] for deciding whether or not the calculated distance between the first and second touch positions decreases in accordance with the lapse of time.” Choi discloses these limitations. (EX-1002 ¶¶63-66.)

Regarding element 1[e][i], Choi discloses a “touch gesture detector 2351” that “detects a touch gesture formed on the touchscreen” and “can discriminate between single touch gestures and multi-touch gestures.” (EX-1003 ¶[0245].) The touch gesture detector outputs touch gesture information to the touch gesture analyzer, which determines the type of touch. (*Id.* ¶¶[0245]-[0246].) Thus, Choi discloses a section for deciding whether or not first and second touch positions are acquired by the acquiring section. (EX-1002 ¶64.)

Regarding element 1[e][ii], Choi discloses that “[o]nce the two touch points are recognized, the device calculates the distance ‘L’ between the two touch points (1305).” (EX-1003 ¶[0167]; *id.* ¶¶[0168], [0180]-[0187], [0246], Figs. 48 (Step 1305 (“calculate distance between two touch points”)), 49; EX-1002 ¶65.)

Regarding element 1[e][iii], Choi discloses that the device “tracks movements of the two touch points to detect an inward drag event (i.e. an event in which the two touch points are dragged to approach with each other as shown in FIG. 49) (1313).” (EX-1003 ¶[0169]; *id.* ¶¶[0061]-[0062] (determining whether the touch points are “dragged to approach each other”), [0183] (describing “inward drag event”), [0187], Fig. 49.) Choi also discloses that, when an inward drag event is detected, the device calculates “the distance L2 between the two touch points after the inward drag event has completed[.]” (*Id.* ¶[0183].) As shown in Figure 49, the distance between the

touch points decreases over time. (*Id.*, Figs. 49, 54.) Thus, Choi discloses limitations 1[e][i]-1[e][iii]. (EX-1002 ¶66.)

Even if Choi did not expressly or inherently disclose limitations 1[e][i]-1[e][iii], they are disclosed by Hillis. (*Id.* ¶¶67-71.) Hillis discloses a display surface “capable of detecting when and where a user touches the display surface.” (EX-1006 ¶[0021]; *id.* ¶¶[0007]-[0008].) Based on that information, “user gestures are identified.” (*Id.* ¶[0021]; *id.* ¶¶[0028], [0009]-[0010].) Hillis discloses “considering a recent history of the contact positions” to determine a “discrete sequence of velocities,” which include both a “rate and direction of motion.” (*Id.* ¶[0029]; *id.* ¶[0034].)

In Hillis, “a user establishes and moves two contact locations” and the “[v]elocities ... are determined for each of the contact points, including magnitudes and directions[.]” (*Id.* ¶[0034].) This defines a “line segment S_{12} ” connecting the two contact points, $\vec{x}_1$ and $\vec{x}_2$. (*Id.* ¶[0035].) The length of the line segment is then “considered” to see “[i]f the length is decreasing[.]” (*Id.*; EX-1002 ¶68.)

Thus, Hillis discloses (1) deciding whether or not first and second touch positions are acquired by the acquiring section (e.g., whether a user “establishes” two contact locations), (2) calculating a distance between the first and second touch positions (e.g., considering length of line connecting $\vec{x}_1$ and $\vec{x}_2$), and (3) deciding whether or not the calculated distance between the first and second touch positions

decreases in accordance with the lapse of time (e.g., determining “[i]f the length is decreasing”). (EX-1002 ¶69.)

Accordingly, to the extent PO argues that Choi does not disclose any of limitations 1[e][i]-1[e][iii], these limitations are disclosed by Hillis. A POSITA would have been motivated to combine the teachings of Choi and Hillis, and would have had a reasonable expectation of success in doing so, for the reasons discussed below. (*Id.* ¶70; *infra* §VII.A.10.)

Thus, Choi and/or Hillis disclose this limitation. (EX-1002 ¶¶63-71.)

6. 1[f]: Setting a Rectangular Area

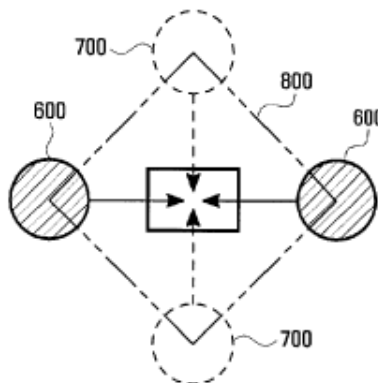
Element 1[f] recites that the selecting section is for “setting a rectangular area with respect to the display and selecting an object or objects contained in the rectangular area in cases where it is decided that the first and second touch positions are acquired and the distance between the first and second touch positions decreases in accordance with the lapse of time.” Choi discloses this limitation. Alternatively, it would have been obvious in view of Hillis. (EX-1002 ¶¶72-77.)

As discussed above for element 1[e], Choi and Hillis both disclose determining whether “the first and second touch positions are acquired and the distance between the first and second touch positions decreases in accordance with the lapse of time.” (*Supra* §VII.A.5; EX-1002 ¶73.)

In those circumstances, the system detects an inward drag event and “defines

a pickup function coverage area and discovers objects within the pickup function coverage area (1311).” (*Id.*; EX-1003 ¶[0168], Fig. 48 (Step 1311).) The system then selects “the object within the pickup function coverage area (1315).” (EX-1003 ¶[0169]; EX-1002 ¶74.)

Choi discloses that the area defined by its inward drag event is rectangular. Choi explains that, “if a multi-touch event with two initial touch points occurs and then an inward drag event occurs with two dragged touch points 600, the device recognizes the two dragged touch points 600 and creates two imaginary points 700 at of [sic] 90 degree angles.” (EX-1003 ¶[0189].) “Next, the device draws an imaginary line connecting the dragged touch points 600 and the imaginary touch points 700 so as to define a pickup coverage area 800.” (*Id.* ¶[0190].) “Next, the device searches the pickup coverage area for objects and selects the objects [] in the pickup coverage area.” (*Id.* ¶[0190].) The coverage area 800 is rectangular because the boundary lines are created at 90° angles to the touch points:



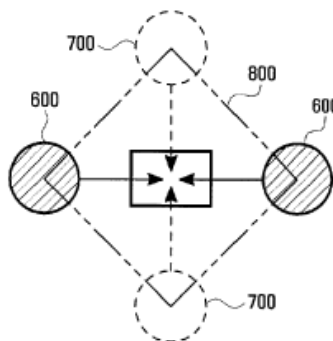
(*Id.*, Fig. 58 (excerpt); *id.*, Figs. 59-60.) Thus, Choi discloses setting a rectangular

area with respect to the display and selecting an object or objects contained in the rectangular area. (EX-1002 ¶¶75-76.) Moreover, it does so in cases where it is decided that the first and second touch positions are acquired and the distance between the first and second touch positions decreases in accordance with the lapse of time as recited. (*Id.*) Doing so also would have been obvious in view of Hillis for the reasons discussed above. (*Supra* §VII.A.5; EX-1002 ¶76.)

Thus, Choi and/or Hillis disclose this limitation. (EX-1002 ¶¶72-77.)

7. 1[g]: Corners of Rectangle Coincident with Initial Touch Points

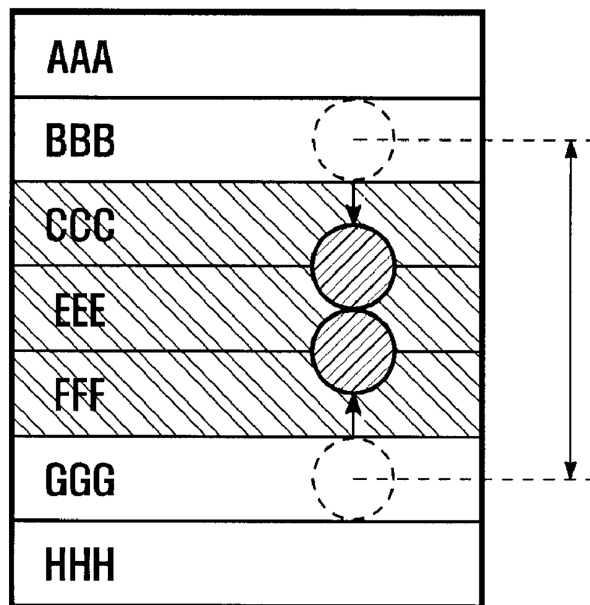
Element 1[g] recites that the “two opposite corners of the rectangular area are respectively coincident with the first and second touch positions occurring at an initial stage of the user’s touches to the touch panel.” Choi discloses that the initial touch points (e.g., 600) define the corners of the rectangular area. (EX-1003 ¶¶[0189]-[0191], [0123], Figs. 58-60; EX-1002 ¶78.) For example, Figure 58 shows the rectangular area (800) defined by the touch points (600) before they are dragged inward (e.g., as shown by the arrows):



(EX-1003, Fig. 58 (excerpt); EX-1002 ¶78.)

Even if Choi did not expressly disclose this limitation, Choi renders it obvious. For example, Choi discloses that one of several options for how its system selects items in response to an inward drag gesture is that the device “recognizes the two touch points made by the touch event [e.g., the initial touch points] and selects the objects CCC, EEE, and FFF placed between the two touch points at the same time regardless of the inward drag event following the touch event.” (EX-1003 ¶[0186].) Choi shows this:

FIG . 56



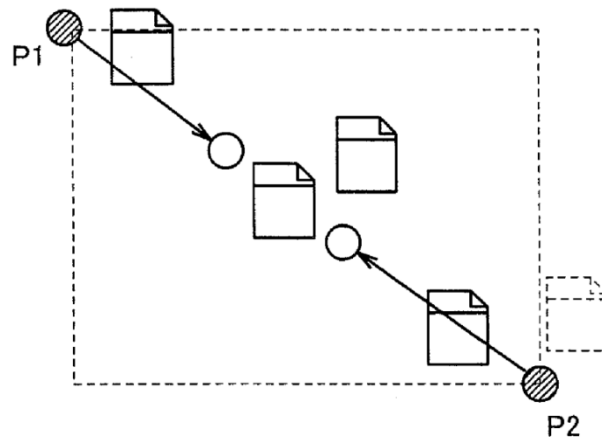
(*Id.*, Fig. 56.) Thus, Choi shows that objects within the initial touch points (e.g., the touch points formed by dotted lines) are selected in response to an inward drag event

(e.g., shown by arrows indicating that the initial, dotted line touch points are dragged to the final, shaded touch points). (*Id.*; EX-1002 ¶79.) A POSITA would have understood based on this disclosure that such an option would have been available for Choi’s Figure 58 embodiment as well—that is, that the rectangular selection area would be defined by the initial touch points regardless of where the touch points end after the inward drag event. (*Id.*)

A POSITA would further have understood that Choi’s system could select items based on the initial touch points, and that doing so would simply be a routine design choice, because doing so was known to POSITAs by the ’487 patent’s earliest possible priority date. For example, Sawayanagi¹ discloses that its system “may identify a rectangle in which two contacts P1 and P2 *indicated initially* are at opposite corners as an area defined by the pinch-in gesture, and may identify icons, each of which is at least partially included in that rectangle[.]” (EX-1014 ¶[0075] (emphasis added).) Sawayanagi shows that objects inside the rectangle defined by initial touch points (P1, P2) are selected:

¹ Sawayanagi, while not prior art to the ’487 patent, claims priority to a Japanese application that was filed before the ’487 patent’s earliest possible priority date. (EX-1014.) Such a reference may be used, as it is here, to show the level of ordinary skill in the art and/or explain how a POSITA would have understood a prior art disclosure. *Yeda Rsch. v. Mylan Pharms., Inc.*, 906 F.3d 1031, 1041 (Fed. Cir. 2018); *SNF S.A. v. Chevron U.S.A., Inc.*, IPR2022-01534, Paper 46 at 43-44 (P.T.A.B. Apr. 18, 2024).

FIG.18



(*Id.*, Fig. 18; EX-1002 ¶80.) Sawayanagi further distinguishes this system from one that relies on the final touch points, and shows a POSITA would have understood that either method could be implemented. (See EX-1014 ¶¶[0075]-[0076], claim 1 (system “identifies a file presented by an icon displayed in an area defined by said two contacts at least either of before and after being moved”); EX-1002 ¶80.) Thus, a POSITA would have understood that selecting items based on initial touch points is a simple, feasible design choice and would have found such a system obvious in view of Choi. (EX-1002 ¶80.)

Thus, Choi discloses, or at least renders obvious, this limitation. (*Id.* ¶¶78-81.)

8. 1[h]: Vectors and Angles

Element 1[h] recites that the selecting section is for deriving a “first vector,” a “straight line,” and a “second vector,” for calculating a “first angle” and a “second

angle,” and for deciding whether the first and second angles are smaller than a “prescribed angle.” Hillis discloses or renders obvious each of these limitations. (EX-1002 ¶¶82-106.)

Although Choi discloses determining the type of gesture (e.g., “inward drag event in which the two touch points are dragged to approach with each other” (EX-1003 ¶[0246])), Choi does not detail the mathematics that determine whether the two touch points approach each other. Hillis discloses those calculations. (EX-1002 ¶83.)

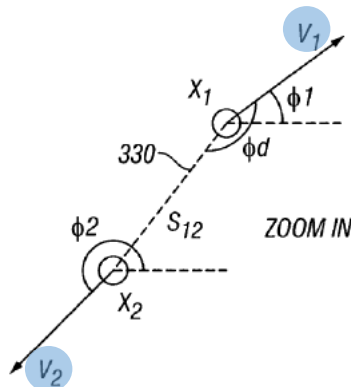
a. First and Second Vectors

Element 1[h] first recites “deriving a first vector extending from the first touch position occurring at a first moment to the first touch position occurring at a second moment after the first moment” and a corresponding limitation for deriving a second vector.

Hillis discloses that when “a user establishes and moves two contact locations,” the “[v]elocities ... are determined for each of the contact points, including magnitudes and directions[.]” (EX-1006 ¶[0034].) These magnitudes and directions define Hillis’s “velocity vectors” (*id.* ¶[0036]) which, like the ’487 patent’s vectors, extend from first and second touch points at a first moment to touch positions at a later moment. (*Id.* ¶¶[0028] (software “records over time the discrete sequence of

positions”), [0029] (“By considering a recent history of the contact positions, a discrete sequence of velocities $\vec{v}_1(n)$, including both a rate and direction of motion, is determined for each distinct contact”), [0031] (describing the movement of touch points over time to determine gesture and associated command), [0035] (velocities determined when user establishes “and moves” contact locations), Figs. 4-5, claims 1, 12, 20, 29; EX-1002 ¶85.)

Hillis illustrates the first and second vectors $\vec{v}_1$ and $\vec{v}_2$, labeled V_1 and V_2 , for a gesture in which two touch points are spreading (e.g., an outward drag event):

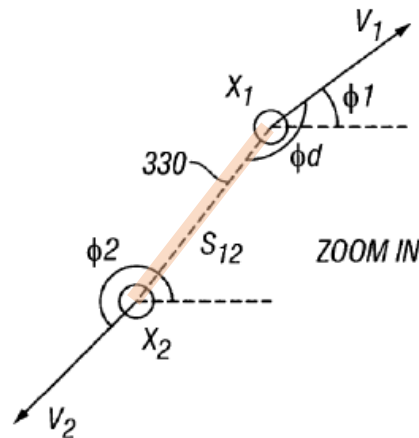


(EX-1006, Fig. 5²; EX-1002 ¶86.) Thus, Hillis discloses deriving the first and second vectors. (*Id.*)

² Figures herein may be colored and/or annotated for clarity.

b. Straight Line Between Initial Touch Points

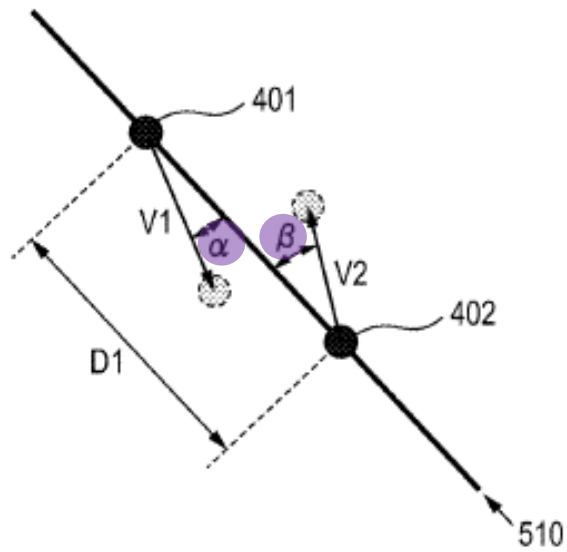
Element 1[h] then recites “deriving a straight line connecting the first and second touch positions occurring at the first moment.” Hillis discloses deriving “line segment S_{12} 330 connecting the positions $\vec{x}_1$ [first touch position at first moment] and $\vec{x}_2$ [second touch position at first moment.]” (EX-1006 ¶[0035].)



(*Id.*, Fig. 5; EX-1002 ¶87.) Thus, Hillis discloses this limitation. (*Id.*; see also EX-1003 ¶¶[0178]-[0179], Figs. 51-52.)

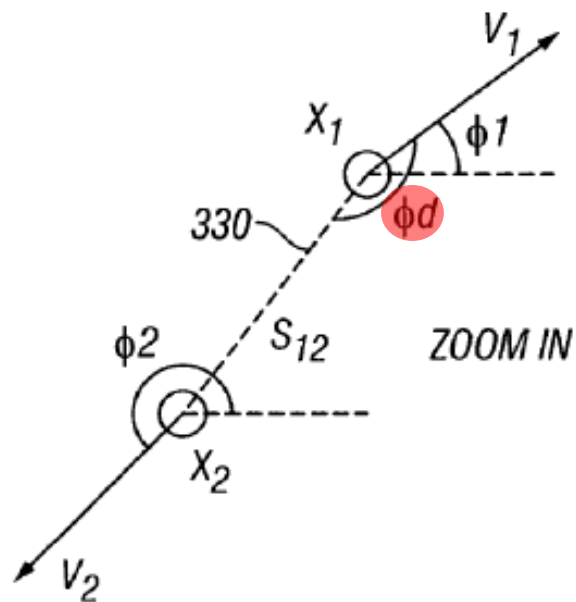
c. First and Second Angles

Element 1[h] then recites that the selecting section is “for calculating a first angle between the first vector and the straight line” and “for calculating a second angle between the second vector and the straight line.” These angles are labeled α and β in Figure 5 of the ’487 patent:



(EX-1001, Fig. 5; EX-1002 ¶88.)

Hillis discloses calculating the same angle, which Hillis labels ϕ_d . (EX-1006 ¶[0035] (“the angle ϕ_d between S_{12} and $\vec{v}_1$ is considered”); EX-1002 ¶89.)



(EX-1006, Fig. 5.)

Hillis discloses calculating “the angle ϕ_d between the line segment S_{12} 330 connecting the positions $\vec{x}_1$ and $\vec{x}_2$ and either of the two velocities[.]” (EX-1006 ¶[0035].) In Figure 5, Hillis considers the angle ϕ_d between line S_{12} and vector $\vec{v}_1$, but the same determination is made for the angle between line S_{12} and vector $\vec{v}_2$. (*Id.*; EX-1002 ¶90.)

Thus, Hillis discloses a selecting section for calculating a first angle (ϕ_d) between the first vector ($\vec{v}_1$) and the straight line (S_{12}) and for calculating a second angle (ϕ_d) between the second vector ($\vec{v}_2$) and the straight line (S_{12}). (*Id.*) But even if Hillis did not disclose calculating angle between both vectors ($\vec{v}_1$, $\vec{v}_2$) and the connecting line (S_{12}), doing so would have been obvious to a POSITA for the reasons discussed below. (EX-1002 ¶91; *infra* §VII.A.10.)

d. Comparison of First and Second Angles

Element 1[h] next recites that the selecting section is “for deciding whether or not the first angle is smaller than a prescribed angle, and for deciding whether or not the second angle is smaller than the prescribed angle.” Hillis discloses this limitation. (EX-1002 ¶¶92-106.)

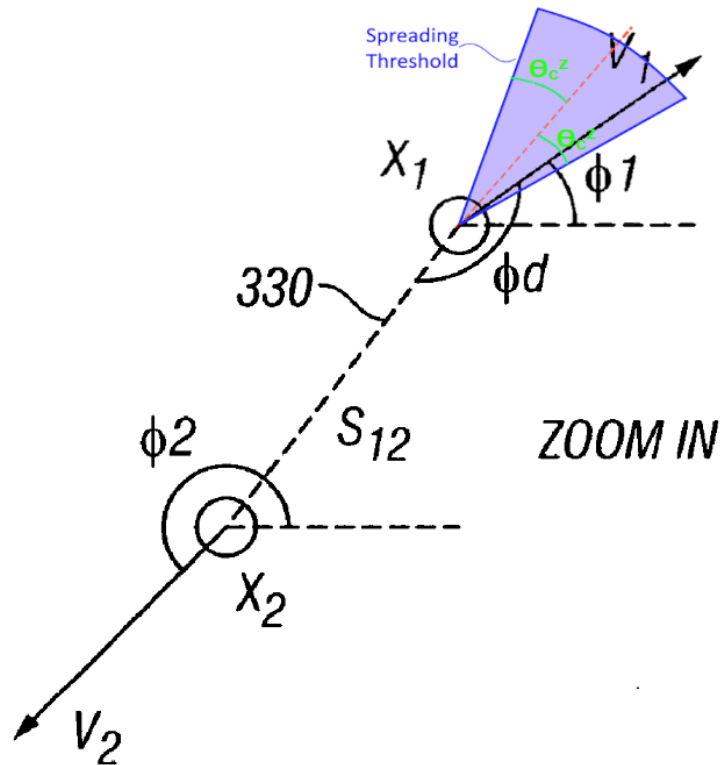
Hillis discloses that “the angle ϕ_d ... is considered” and, if “the line segment S_{12} and the velocity are *found to be in approximate alignment*, then the gesture is identified as a request for a zoom of the display.” (EX-1006 ¶[0035] (emphasis

added).) To determine whether the vectors and the line are in approximate alignment, the angles between them are compared to a “predetermined tolerance” represented as Θ_c^z . (*Id.* ¶¶[0034]-[0035]; EX-1002 ¶93.)

Hillis’s Figure 5 shows an example in which the touch points are being separated, and the vector $\vec{v}_1$ is considered. (EX-1006, Fig. 5, ¶[0035].) Hillis discloses that determining whether the line segment S_{12} and vector $\vec{v}_1$ are in “approximate alignment” is performed using the following equation:

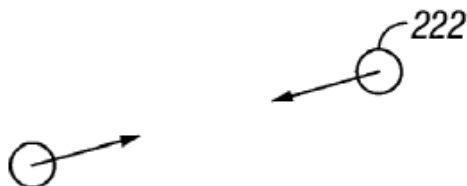
$$|\pi - \phi_d| < \Theta_c^z$$

(*Id.*) The left side of this equation represents the difference in angle between a perfect outward drag gesture (e.g., one that is at π radians, or 180° , from the line S_{12}) and the vector $\vec{v}_1$, which is at angle ϕ_d . (EX-1002 ¶94.) That difference must be less than the predetermined tolerance (Θ_c^z) for the inequality to be true. If it is true, then the gesture will be identified as a request to zoom the display. Thus, if the tolerance Θ_c^z is 30° , then the gesture will be identified as a request to zoom the display if ϕ_d is between 150° and 210° . (*Id.*) This hypothetical range is shown in the annotated version of Figure 5 below:



(EX-1006, Fig. 5; EX-1002 ¶94.)

Hillis’s Figure 4 shows another exemplary gesture comprising “an approaching motion of the two contact locations”:



(EX-1006, Fig. 4.) Hillis associates this gesture with an “outward zoom.” (*Id.* ¶[0031]; EX-1002 ¶95.)

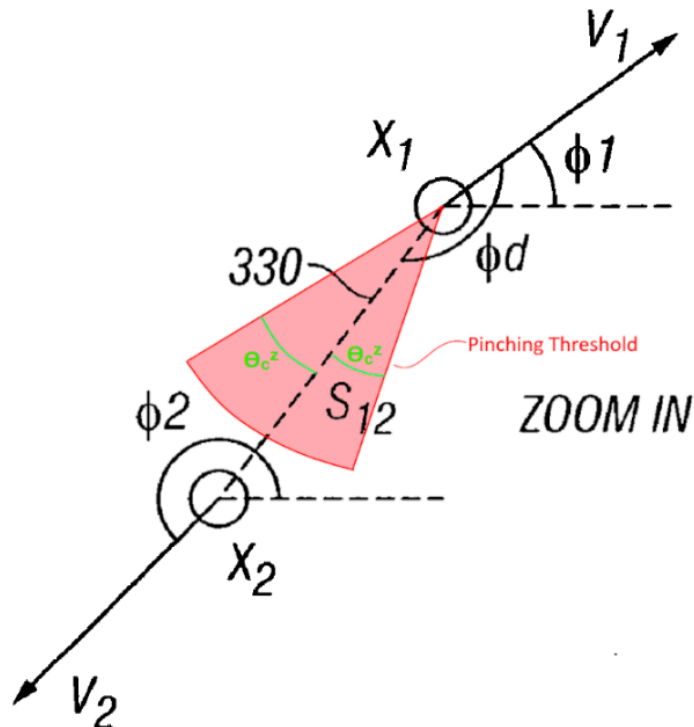
A POSITA would have understood from Hillis that, to determine whether the vector $\vec{v}_1$ and the line segment S_{12} are in “approximate alignment” *when the touch points are approaching each other* as in Figure 4 (rather than spreading apart as in

Figure 5), Hillis would determine whether the vector $\vec{v}_1$ is within the predetermined tolerance (Θ_c^z) of the line segment S_{12} . That is, when the angle ϕ_d satisfies either of the two inequalities:

$$\phi_d < \Theta_c^z \text{ or } 2\pi - \phi_d < \Theta_c^z$$

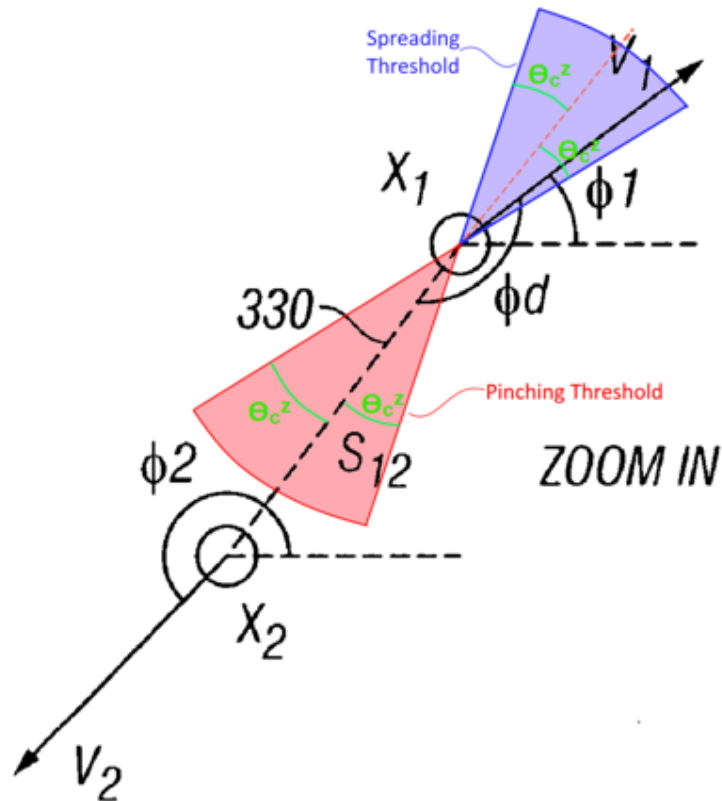
(EX-1002 ¶96.) In other words, if the tolerance Θ_c^z is 30° , then the gesture will be identified as an outward zoom if ϕ_d is either less than 30° or greater than 330° . (*Id.*)

This range is shown in the annotated version of Figure 5 below:



(EX-1006, Fig. 5; EX-1002 ¶96.) A POSITA would have understood this based on the basic principle of vertical angles, which dictates that opposite angles formed by the same straight lines are the same. (EX-1002 ¶96.) Thus, if the threshold for

“approximate alignment” is as Hillis discloses for a spreading gesture, then the threshold of “approximate alignment” in a pinching gesture would be analogous:



(EX-1006, Fig. 5; EX-1002 ¶96.) A POSITA would further have understood that analogous, geometrically equivalent calculations are performed to determine whether the vector $\vec{v}_2$ is likewise in approximate alignment with the line segment S_{12} . (EX-1002 ¶96.)

Hillis teaches considering the angle between the line and “either” vector. (EX-1006 ¶[0035].) To the extent this disclosure of Hillis does not disclose considering the angles between the line segment and *both* vectors, a POSITA would have been motivated to do so in view of Hillis for several reasons. (EX-1002 ¶¶97-106.)

First, Hillis discloses that “inexperienced users ... may be overwhelmed by the power and flexibility” of its gestures. (EX-1006 ¶[0033].) For example, “an imperfect attempt to zoom” (spreading) can result in “a combined inward zoom and a slight rotation” that may leave the user “confused or disoriented.” (*Id.*) A POSITA would have understood that comparing both angles to the “predetermined tolerance” would limit the risk of “imperfect” touch gestures and would reduce confusion and disorientation. (EX-1002 ¶98.) Specifically, it would help restrict the pinch gesture to situations in which both touch points are within the “predetermined tolerance” rather than detecting this gesture when a single touch point meets that criteria—a scenario where a user is less likely to have intended the gesture. (*Id.*)

Second, calculating both angles would provide more accurate gesture detection. For example, suppose a POSITA implementing Hillis set a predetermined tolerance of 30° , and a user performed a gesture where the angle of $\vec{v}_1$ was 15° and the angle of $\vec{v}_2$ was 90° . If a POSITA only considered the angle of $\vec{v}_1$ (15°), then it would satisfy the “approximate alignment” criteria and the gesture would be identified as a pinch. But if the angle of $\vec{v}_2$ had been considered, it might be characterized as a rotate gesture. (See EX-1006 ¶[0036], Fig. 5; EX-1002 ¶99.) A POSITA would have been motivated to ensure that the gesture considers whether *both* touch points are moving toward each other in “approximate alignment” to accurately characterize the gesture as a pinch. (EX-1002 ¶99.)

Third, it would have been common sense for a POSITA to consider both angles because the calculations are known, simple, and easily understood; the benefits of doing so would have been known to a POSITA, as discussed above; and the solution represents merely repeating an existing calculation. (*Id.* ¶100); *B/E Aerospace, Inc. v. C&D Zodiac, Inc.*, 962 F.3d 1373, 1379-81 (Fed. Cir. 2020).

Fourth, the modification is merely the simple addition of one known element (considering the angle of the second vector) to another known element (Hillis's gesture detection) to obtain predictable results (a more accurate gesture detection method that considers both angles). (EX-1002 ¶¶101-03); *see KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 417 (2007).

Fifth, the modification uses of a known technique (considering the angle of the second vector) to improve a similar device and method (Hillis's gesture detection) in the same way. (*Id.*)

Sixth, the modification applies a known technique (considering the angle of the second vector) to a known device and method (Hillis's gesture detection) that is ready for improvement and yields predictable results (a more accurate gesture detection method). (*Id.*)

Seventh, the modification represents a choice from a finite number of identified, predictable options. A POSITA implementing Hillis's gesture detection method could consider the angle of the first vector, the angle of the second vector,

or both. (EX-1002 ¶104.) Thus, at a minimum, it would have been obvious to a POSITA to try calculating and analyzing the angles for both vectors. *KSR*, 550 U.S. at 421.

A POSITA would have reasonably expected success in the modification at least because the calculations for each vector are easily derived mathematically from Hillis’s disclosure. (EX-1002 ¶105.) Implementing such a system was well within the skill of a POSITA. (*Id.*) Moreover, as discussed above, such a modification would merely reflect the repetition of a known calculation (Hillis’s angle calculation) to detect a known gesture (an inward drag). (*Id.*)

Thus, Choi and Hillis disclose this limitation or render it obvious. (*Id.* ¶¶82-106.)

9. 1[i]: Selecting Objects

Element 1[i] repeats prior limitations and recites that the selecting section sets the rectangular area and selects objects in that area “in cases where it is decided that” the distance between the first and second touch positions decreases and the first and second angles are smaller than the prescribed angle. Element 1[f] recited setting the rectangular area and selecting objects within that area “in cases where it is decided that ... the distance between the first and second touch positions decreases in accordance with the lapse of time.” Thus, element 1[i] adds that the area is set and

objects are selected when both the first and second angle are smaller than the “prescribed angle.”

Choi discloses setting the rectangular area and selecting objects in that area upon recognition of two touch points and an inward drag event. (*Supra* §VII.A.6.) And, as discussed above, it would have been obvious to a POSITA to use Hillis’s angle calculations and comparison to a “predetermined tolerance” to detect when a user of Choi’s device performed an “inward drag event” (as opposed to another gesture such as a rotation gesture). (*Supra* §VII.A.8.) Thus, Choi and Hillis together disclose and render obvious this limitation. (EX-1002 ¶¶107-08.)

10. Motivation to Combine

A POSITA would have been motivated to use Hillis’s calculations to detect the inward drag event described in Choi for several reasons. (EX-1002 ¶¶109-19.)

First, Choi suggests the combination. Choi teaches using an “inward drag” gesture to select objects within an area. But Choi does not disclose detailed calculations for detecting an “inward drag” gesture. (*Id.* ¶110.) A POSITA therefore would have looked to other references, like Hillis, for details of detecting such events and distinguishing “inward drag” gestures from other gestures.

Second, Choi discloses that it is advantageous for a gesture system to “allow[] the user to handle the objects efficiently and intuitively.” (EX-1003 ¶[0254].) Hillis

explains that its method for detecting gestures reduces user confusion and disorientation. (EX-1006 ¶[0033].) Thus, a POSITA would have been motivated to implement Hillis’s gesture detection methods (e.g., calculating and comparing angles to a predetermined tolerance) to improve the user experience, making the experience more efficient and intuitive. (EX-1002 ¶111.)

Third, although Hillis pairs a particular command with the inward drag gesture (zoom out), Hillis explicitly states that “[t]hose skilled in the art will appreciate that ... *different executions for such gestures* may be chosen.” (EX-1006 ¶[0031].) In view of this teaching, a POSITA would have been motivated to use Hillis’s method for detecting a pinching gesture for the area-selection execution Choi describes. (EX-1002 ¶112.)

Fourth, Choi and Hillis are both directed to user interfaces for touch-enabled electronic devices. (*See* EX-1003, Abstract; EX-1006, Abstract; EX-1002 ¶113.) They each address systems and methods for managing digital objects through touch inputs and share the goal of enhancing interaction between users and the graphical elements displayed on a touchscreen. (*Id.*) A POSITA would have been motivated to combine these similar references to obtain the usability, responsiveness, and intuitiveness benefits of each. (*Id.*)

Fifth, the combination represents nothing more than the simple addition of a known element (Hillis’s vector and angle calculations for detecting an inward drag)

to another known element (Choi's inward-drag-to-select function) to obtain the predictable results of accurately detecting an inward-drag gesture to define a selection area. (*Id.* ¶¶114-16); *KSR*, 550 U.S. at 417.

Sixth, the combination represents the use of a known technique (Hillis's detection of an inward-drag gesture) to improve a similar device and method (Choi's system, including the inward-drag-to-select function) in the same way. (*Id.*)

Seventh, the combination merely applies a known technique (Hillis's method of inward-drag gesture detection) to a known device and method (Choi's inward-drag-to-select function) that is ready for improvement and yields predictable results (accurately detecting the inward-drag gesture). (*Id.*)

A POSITA would have reasonably expected success in using Hillis's inward-drag detection method to detect the inward-drag event described in Choi for several reasons. (EX-1002 ¶¶117-18.) First, modifying Choi to implement Hillis's mathematical calculations for identifying a known gesture was within the skill of a POSITA. (*Id.* ¶117 (citing EX-1003 ¶¶[0221], [0257]).) As discussed above, such a combination would merely reflect the use of a known calculation (from Hillis) to detect a known gesture (Choi's inward drag). (*Id.*) Further, Hillis's gesture detection techniques are based on age-old geometric and mathematical concepts and would have been trivial for a POSITA to implement in Choi's system. (*Id.*)

Moreover, Choi discloses that its own “touch gesture analyzer” uses similar “distance” and “direction” parameters to identify when “an inward drag event” (e.g., pinch gesture) has occurred. (EX-1003 ¶[0246] (“[T]he touch gesture analyzer 2353 compares the *distance* L between the two touch points of a touch event of the multi-touch gesture and a predetermined threshold value Th and then checks the *direction* of the drag event following the touch event. If the distance L is equal to or greater than the threshold Th, and the drag event is an inward drag event in which the two touch points are dragged to approach with each other, the touch gesture analyzer 2353 determines the multi-touch gesture is a pickup [i.e. pinch] gesture”).) Because Choi and Hillis already use similar systems to detect an inward drag gesture, a POSITA would have reasonably expected success in combining the references’ teachings and using angular calculations to detect inward-drag gestures, as was disclosed in Hillis, to identify the inward-drag gesture described in Choi. (EX-1002 ¶118.)

Thus, Choi and Hillis disclose or render obvious each limitation of claim 1, and claim 1 as a whole would have been obvious to a POSITA. (*Id.* ¶¶56-119.)

B. Claims 11 and 12

Independent claims 11 and 12 are a method claim and a non-transitory computer-readable medium claim, respectively, that recite virtually identical limitations to those addressed above for claim 1, including a display, a touch panel, a pinch

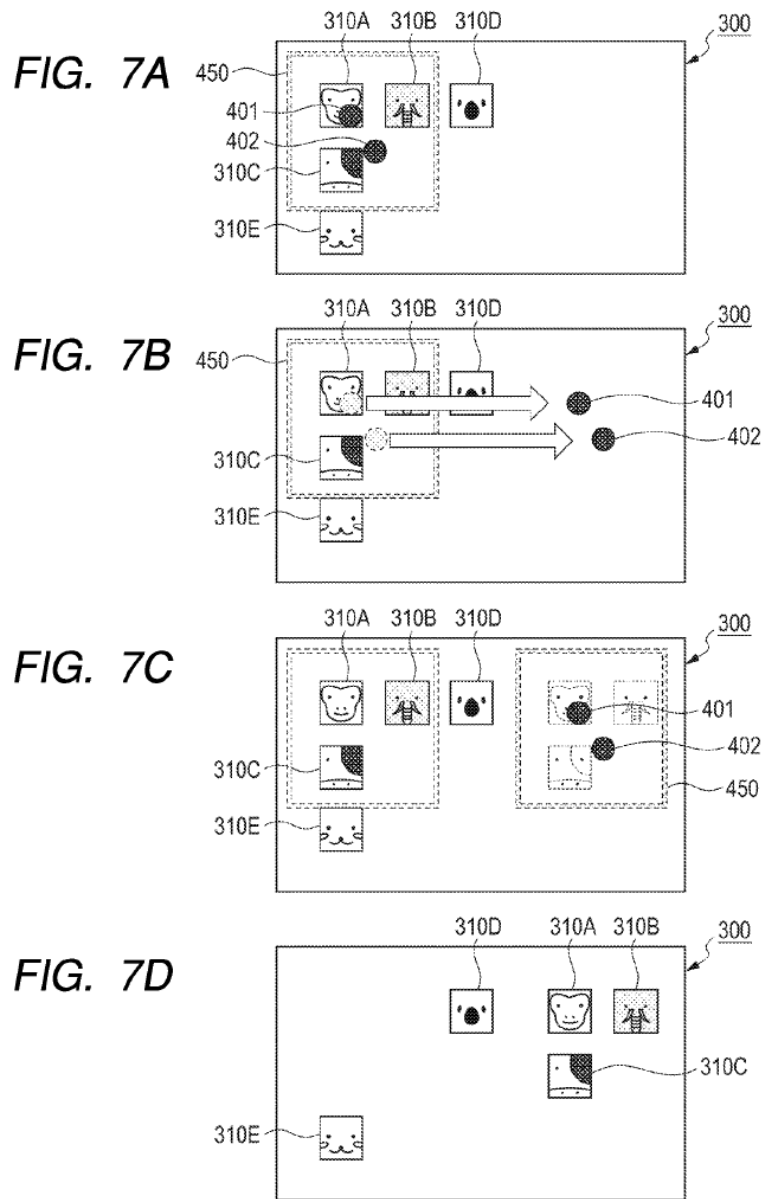
gesture, and selecting objects in a rectangular area. These limitations are disclosed by the prior art, and the claims would have been obvious to a POSITA, for the reasons discussed above. (*Supra* §VII.A; EX-1002 ¶120.)

VIII. GROUND 1B: CLAIMS 2 AND 3 WOULD HAVE BEEN OBVIOUS OVER CHOI, HILLIS, OGAWA, AND OPTIONALLY MCGIBNEY.

As discussed above, the limitations of claim 1 are disclosed by the references in Ground 1a. (*Supra* §VII.A.) Those references, Ogawa, and/or McGibney disclose the additional limitations of claims 2-3. (EX-1002 ¶¶121-50.)

A. Claim 2

Claim 2 depends from claim 1 and further recites a “moving section.” This moving section decides (1) “whether or not the distance between the first and second touch positions is substantially constant after the object or objects contained in the rectangular area are selected” and (2) “whether or not the first and second touch positions are slid in substantially a same direction after the object or objects contained in the rectangular area are selected.” In “cases where it is decided that the distance between the touch positions is substantially constant” and the touch positions are slid in “substantially a same direction,” then the selected object or objects are moved “along said same direction.” The ’487 patent’s Figures 7A-7D illustrate this moving operation:



(EX-1001, Figs. 7A-7D; EX-1002 ¶122.)

1. Choi

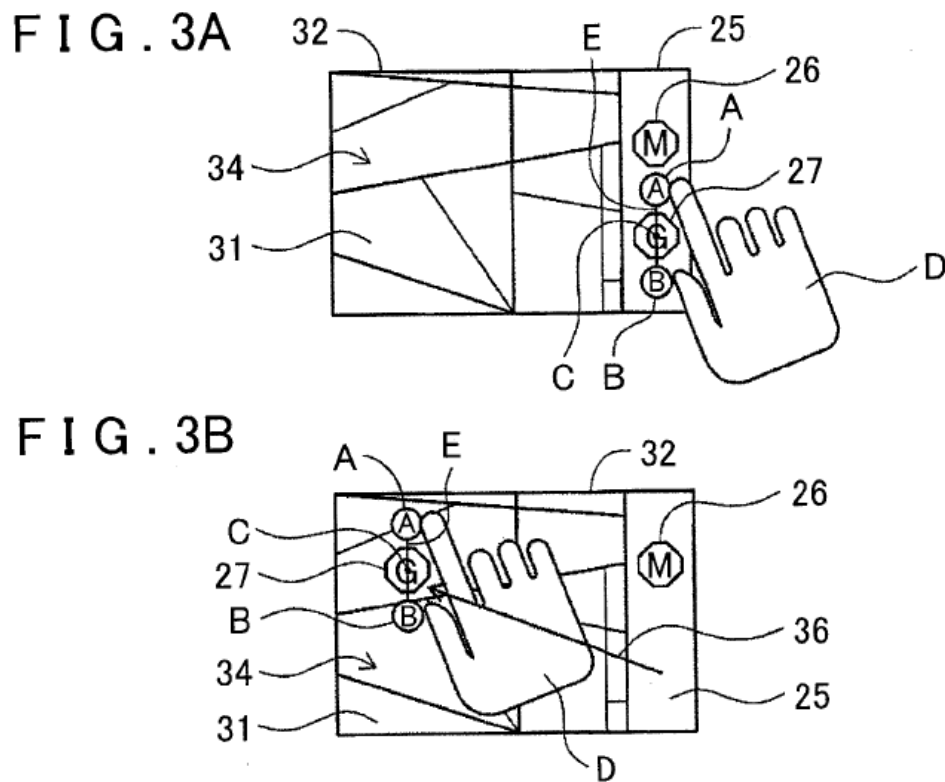
As discussed above, Choi and Hillis together disclose “selecting objects” as recited in claim 1. (*Supra* §VII.A.) Choi further discloses using gestures to pick up and move objects that have been selected. For example, Choi discloses that a user

can first perform an inward drag gesture to select objects (EX-1003 ¶¶[0062]-[0063]); then, the user can lift their fingers to “pick up” the objects (*id.* ¶¶[0064]-[0065]); finally, the user can perform an outward drag operation to “release” the objects (*id.* ¶[0083]). (*See also id.* ¶[0047], Figs. 26-34, 41; EX-1002 ¶123.)

Thus, Choi discloses moving selected objects, but does so using different gestures than those recited in the ’487 patent. However, Ogawa and/or McGibney disclose the claimed moving gestures. (EX-1002 ¶124.)

2. Ogawa

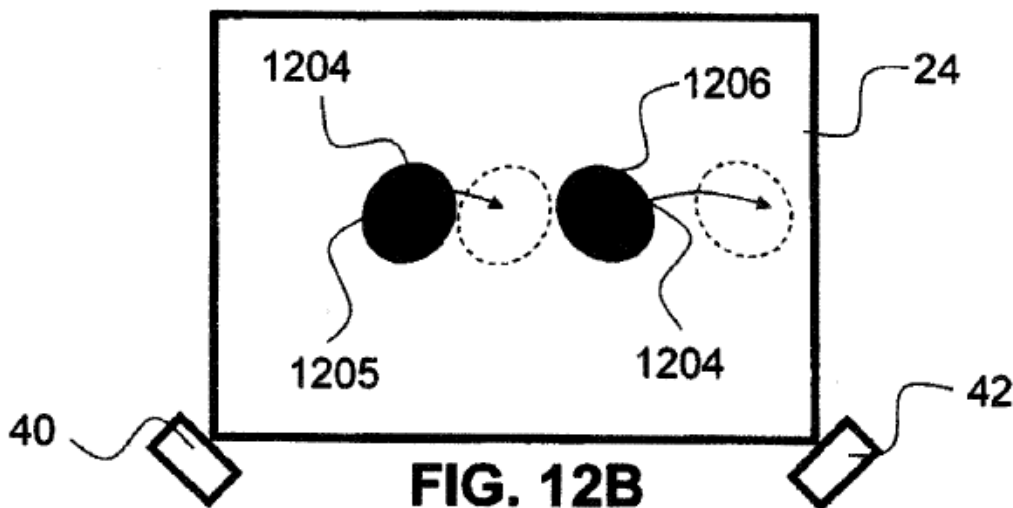
Ogawa discloses using a touch gesture to select objects, similar to Choi. (EX-1007 ¶[0050]; EX-1002 ¶125.) Ogawa further discloses that the selected objects can then be relocated with the same gesture recited in the ’487 patent. Specifically, Ogawa discloses that, “if the operator moves the [selected] respective points ... in the direction of an arrow 36 while keeping a positional relationship between the two touched points ... it is determined that the destination icon 27 is being moved.” (EX-1007 ¶[0051].) Ogawa further discloses that moving occurs when touch points are moved “in the same direction while keeping the space there-between[.]” (*Id.* ¶[0068].) Ogawa’s Figures 3A-3B illustrate the moving gesture:



(*Id.*, Figs. 3A-3B.) A POSITA would have understood that, when Ogawa discloses that movement of the selected object(s) occurs when the touch points are moved “while keeping a positional relationship between the touch points” and “in the same direction while keeping the space therebetween,” Ogawa is disclosing that the move functionality occurs when the “first and second touch positions are slid in substantially a same direction” and when the “distance between the first and second touch positions is substantially constant” as recited in claim 2. (EX-1002 ¶125.) Thus, Ogawa discloses this limitation. (*Id.*)

3. McGibney

Even if Ogawa did not disclose that the distance between the touch points is “substantially constant” during the gesture, McGibney discloses it. McGibney discloses that a two-touch-point slide gesture is detected when the touch points “move in one direction” and “maintain[] approximately the same distance apart from one another.” (EX-1008 ¶[0073].) McGibney’s Figure 12B illustrates this gesture:



(*Id.*, Fig. 12B.) Thus, McGibney discloses deciding whether the distance between the first and second touch positions is substantially constant and whether the first and second touch positions are slid in substantially a same direction. (EX-1002 ¶126.)

4. Motivation to Combine

For the reasons below, a POSITA would have been motivated to combine (1) the teachings of Choi (as modified by Hillis), which together disclose selecting

objects using an inward drag gesture, with (2) the teachings of Ogawa, which discloses detecting a sliding gesture to move selected objects, and (3) optionally the teachings of McGibney, which likewise discloses detecting a sliding gesture, to arrive at the claimed system. (EX-1002 ¶¶127-35.)

First, Choi suggests the combination. Choi discloses that it is advantageous for a gesture system to “allow[] the user to handle the objects efficiently and intuitively” and that the gestures be “formed with fingers as if handling physical objects.” (EX-1003 ¶¶[0254]-[0255].) A POSITA would have understood that, because it is Choi’s inward drag gesture that selects objects, the sliding gesture of Ogawa and/or McGibney could be performed without first performing Choi’s lifting gesture (e.g., the user could perform an inward drag gesture to select objects and then, without lifting their fingers, perform a sliding gesture to move the selected objects). (EX-1002 ¶128.) This would improve the efficiency and intuitiveness of the overall gesture because it would allow the user to perform the entire gesture in a single, fluid motion rather than requiring the user to perform part of the gesture, then lift their fingers and move elsewhere to perform the remainder. (*Id.*) Furthermore, the modified gesture satisfies Choi’s aim of mimicking the handling of physical objects,

since physical objects can also be slid from one place to another using the hands.³
(*Id.*)

Second, Choi further suggests the combination because it discloses that “many variations and/or modifications of the basic inventive concepts herein taught ... will still fall within the spirit and scope of the present invention.” (EX-1003 ¶[0257]; EX-1002 ¶129.)

Third, Choi, Hillis, Ogawa, and McGibney are all directed to systems for touch interaction with graphical interfaces. (*See* EX-1003 (Choi), Abstract; EX-1006 (Hillis), Abstract; EX-1007 (Ogawa), Abstract; EX-1008 (McGibney), Abstract; EX-1002 ¶130.) McGibney and Ogawa’s techniques are broadly applicable across various applications, including to those disclosed in Choi and Hillis, because they rely on the same types of input (e.g., multi-touch). (*Id.*) Thus, implementing Ogawa and/or McGibney’s teachings in Choi and Hillis’s systems would have involved routine engineering, and a POSITA would have been motivated to do so to achieve the benefits Ogawa and McGibney describe. (*Id.*)

Fourth, the combination represents merely the simple addition of one known element (Ogawa and/or McGibney’s sliding gesture) to another known element

³ For this reason, the gesture would still fulfill Choi’s aims even if the user was required to lift their fingers between the inward drag gesture and the sliding gesture. (EX-1002 ¶128.)

(Choi’s system, as modified by Hillis) to obtain predictable results (a gesture system that uses a sliding gesture to move selected objects). (EX-1002 ¶¶131-33); *KSR*, 550 U.S. at 417.

Fifth, the combination represents the use of a known technique (sliding gesture as in Ogawa and/or McGibney) to improve a similar device and method (Choi’s gesture system, as modified by Hillis) in the same way. (*Id.*)

Sixth, the combination applies a known technique (sliding gesture as in Ogawa and/or McGibney) to a known device and method (Choi’s gesture system, as modified by Hillis) that is ready for improvement and yields predictable results (a gesture system that uses a sliding gesture to move selected objects). (*Id.*)

A POSITA would have reasonably expected success in the combination for several reasons. (EX-1002 ¶134.) First, Choi discloses that “many variations and/or modifications of the basic inventive concepts herein taught ... will still fall within the spirit and scope of the present invention,” leading a POSITA to reasonably expect success. (EX-1003 ¶[0257]; EX-1002 ¶134.) Second, sliding gestures like those disclosed in Ogawa and McGibney were well-known in the art. (EX-1002 ¶134.) Furthermore, as discussed above, the combination merely represents the simple addition of a known element (a sliding gesture) to a known system (Choi’s, as modified by Hillis). (*Id.*) Such a modification was well within the skill of a POSITA. (*Id.*)

Thus, Choi, Hillis, Ogawa, and/or McGibney disclose or render obvious each limitation of claim 2, and claim 2 would have been obvious as a whole to a POSITA. (*Id.* ¶¶122-35.)

B. Claim 3

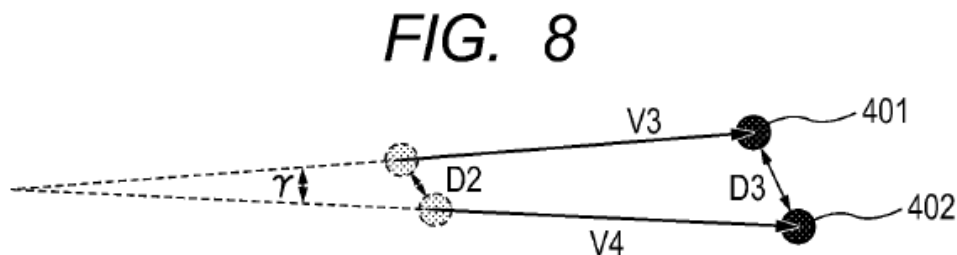
Claim 3 depends from claim 2 and recites limitations that describe a method of accomplishing what is claimed in claim 2. For example, claim 2 recites “deciding whether or not the distance between the first and second touch positions is substantially constant.” Claim 3 recites a particular method for doing so, i.e., that the moving section “calculate[es] a first distance” between the touch positions at a “first moment” and a “second distance” between the touch positions at a “second moment,” and then “calculate[s] a variation” between the first and second distances and decides if the “calculated variation is within a prescribed allowable range.”

Based on the disclosure of Choi, Hillis, Ogawa, and/or McGibney, it would have been obvious to a POSITA to use the method recited in claim 3 to determine whether the distance between the first and second touch positions is substantially constant. (EX-1002 ¶137.) First, Choi and Hillis both disclose calculating the distance between touch positions at first and second moments in time for the purpose of comparing them. (*Supra* §VII.A.5.) Second, Ogawa and McGibney disclose that a sliding gesture is detected when the distance between touch positions at first and second moments in time remains approximately the same. (*Supra* §§VIII.A.2-

VIII.A.3.) A POSITA would have understood that requiring the variation between distances over time to remain “within a prescribed allowable range” is inherent in, or at least suggested by, Ogawa’s disclosure that the touch points must “keep[] a positional relationship” and “keep[] the space therebetween” and/or McGibney’s disclosure that the touch points must “maintain[] approximately the same distance apart from one another.” (*Id.*; EX-1002 ¶137.) Thus, the references disclose, or at least suggest, this portion of the limitation. (EX-1002 ¶137.)

Claim 3 further recites that the moving section derives first and second vectors, just as in claim 1, and then “calculate[s] an angle between the first and second vectors” and “decide[s] whether or not the calculated angle is smaller than a prescribed angle.” This accomplishes claim 2’s limitation of “deciding whether or not the first and second touch positions are slid in substantially a same direction.” (EX-1002 ¶138.)

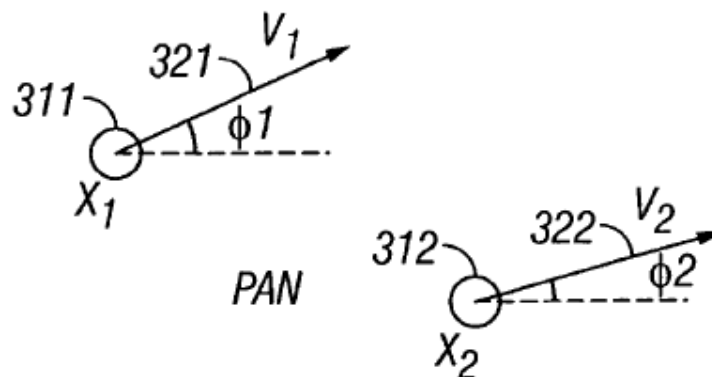
The ’87 patent illustrates the angle (γ) between the first and second vectors described in claim 3:



(EX-1001, Fig. 8; EX-1002 ¶139.)

Ogawa discloses that for a sliding gesture to be detected, the touch points must move “in the same direction”; similarly, McGibney discloses that the touch points must “move in one direction.” (*Supra* §§VIII.A.2-VIII.A.3; EX-1002 ¶140.)

Hillis discloses a gesture detection calculation that determines whether the first and second touch points move in the same direction. (EX-1006 ¶[0034] (“If the directions are found to be similar ... the identified gesture is associated with a panning [e.g., sliding] movement”).) The “pan” gesture is executed when two velocity vectors, originating at their respective touch points, move in the same direction. (*Id.*) The respective directions (ϕ_1 and ϕ_2) of the velocity vectors ($\vec{v}_1$ and $\vec{v}_2$, labeled V_1 and V_2 in the figure below) are determined by calculating the angle between each vector and an arbitrary baseline:



(*Id.*, Fig. 5; EX-1002 ¶141.)

Hillis’s two touch points X_1 and X_2 are moving in “substantially [the] same direction” when the difference between their associated angles (ϕ_1 and ϕ_2) is small

(e.g., smaller than a prescribed angle). (EX-1006 ¶¶0034]; EX-1002 ¶142.) In Hillis, this determination is represented by the equation

$$|\phi_1 - \phi_2| < \Theta_c^p$$

which, in plain terms, states that the difference between the two angles ϕ_1 and ϕ_2 is less than a prescribed angle Θ_c^p . (*Id.*) The calculated difference between ϕ_1 and ϕ_2 is equivalent to the angle γ of the '487 patent. (EX-1002 ¶142.)

A POSITA would have been motivated to combine the teachings of Choi (which, as modified by Hillis, discloses using an inward drag gesture to select objects), Ogawa and/or McGibney (which disclose moving selected objects based on a sliding gesture wherein two touch points maintain a constant distance and move in the same direction), and Hillis (which discloses a method of detecting a sliding gesture) to arrive at the claimed system for several reasons. (*Id.* ¶¶143-50.)

First, a POSITA would have been motivated to implement a sliding gesture to move selected objects for the reasons discussed above for claim 2. (*Supra* §VIII.A; EX-1002 ¶144.)

Second, Ogawa and McGibney suggest the combination. Ogawa and McGibney disclose criteria for detecting a sliding gesture, but lack detail on how to perform calculations to determine if the criteria are met. A POSITA would have been motivated to look to Choi and Hillis, which disclose the requisite calculations. (EX-1002 ¶145.)

Third, the combination represents merely the simple addition of one known element (Hillis and/or Choi's sliding gesture calculations) to another known element (Ogawa and/or McGibney's sliding gesture) to obtain predictable results (effectively detecting sliding gestures). (*Id.* ¶¶146-48); *KSR*, 550 U.S. at 417.

Fourth, the combination uses a known technique (Hillis and/or Choi's calculations) to improve a similar device and method (Ogawa and/or McGibney's sliding gesture) in the same way. (*Id.*)

Fifth, the combination applies a known technique (Hillis and/or Choi's calculations) to a known device and method (Ogawa and/or McGibney's sliding gesture) that is ready for improvement and yields predictable results (effectively detecting sliding gestures). (*Id.*)

A POSITA would have reasonably expected success in the modification for several reasons, including for the reasons discussed above for claim 2. (*Supra* §VIII.A; EX-1002 ¶149.) Additionally, sliding gestures as in Ogawa and McGibney, and calculations as in Hillis and Choi, were well-known in the art, further leading a POSITA to reasonably expect success. (EX-1002 ¶149.) Furthermore, as discussed above, the combination merely represents the simple addition of a known element (Hillis and/or Choi's sliding gesture calculations) to a known method (Ogawa and/or McGibney's sliding gesture). (*Id.*) Such a modification was well within the skill of a POSITA. (*Id.*)

Thus, Choi, Hillis, Ogawa, and/or McGibney disclose or render obvious each limitation of claim 3, and claim 3 would have been obvious as a whole to a POSITA. (*Id.* ¶¶136-50.)

IX. GROUND 1C: CLAIM 10 WOULD HAVE BEEN OBVIOUS OVER CHOI, HILLIS, YEH, AND ORDING.

As discussed above, the limitations of claim 1 are disclosed by the references in Ground 1a. (*Supra* §VII.A.) Those references, Yeh, and/or Ordning disclose the additional limitations of claim 10. (EX-1002 ¶¶151-66.)

Claim 10 depends from claim 1 and further recites a “menu indicating section” that performs four functions after the object(s) in the rectangular area are selected: (1) “calculating a first variation of the first touch position”; (2) “calculating a second variation of the second touch position”; (3) “deciding whether or not both the first and second variations remain within a prescribed allowable range for at least a prescribed time interval”; and (4) “indicating a list of commands a user can give” with respect to the object(s) when “both the first and second variations remain within the prescribed allowable range for at least the prescribed time period.” In other words, when the touch points are substantially stationary for a prescribed time interval, a menu with various commands may be displayed. (EX-1001, 19:25-32.) The patent shows the touch points (401, 402) and resulting menu in Figures 19A-19B:

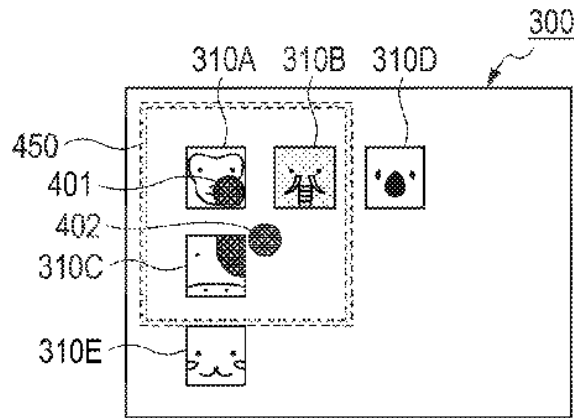


FIG. 19A

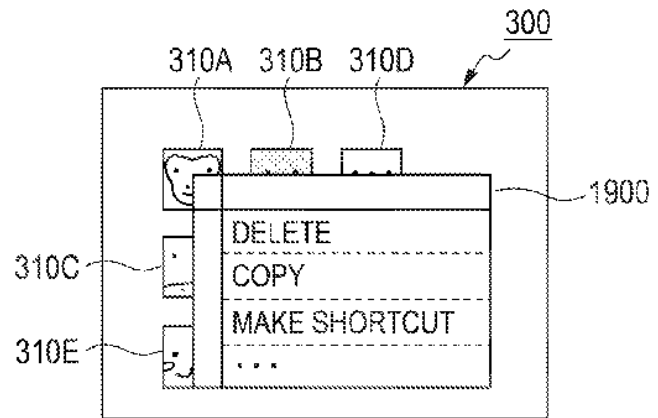


FIG. 19B

(EX-1001, Figs. 19A-19B; EX-1002 ¶152.)

This claim merely recites a well-known “press-and-hold” or “dwell” gesture, which was known in the art. (EX-1002 ¶153.)

Yeh discloses a “dwell” gesture in which a “finger touches a touch coordinate P1 on the touch panel 1 when $T=T1$. After the finger stays at the touch coordinate P1 for a period of dwell time,” a dwell gesture is detected and the appropriate action taken. (EX-1009 ¶[0020].) When a dwell gesture is detected, a “frame item” (e.g., a menu) is presented surrounding the touch location. (*Id.*; *id.*, Fig. 2B.) Yeh’s menu may include “a drag up item 22, a copy item 24, a forward item 26, a paste item 28, a drag down item 30, an undo item 32, a back item 34, and a delete item 36.” (*Id.*)

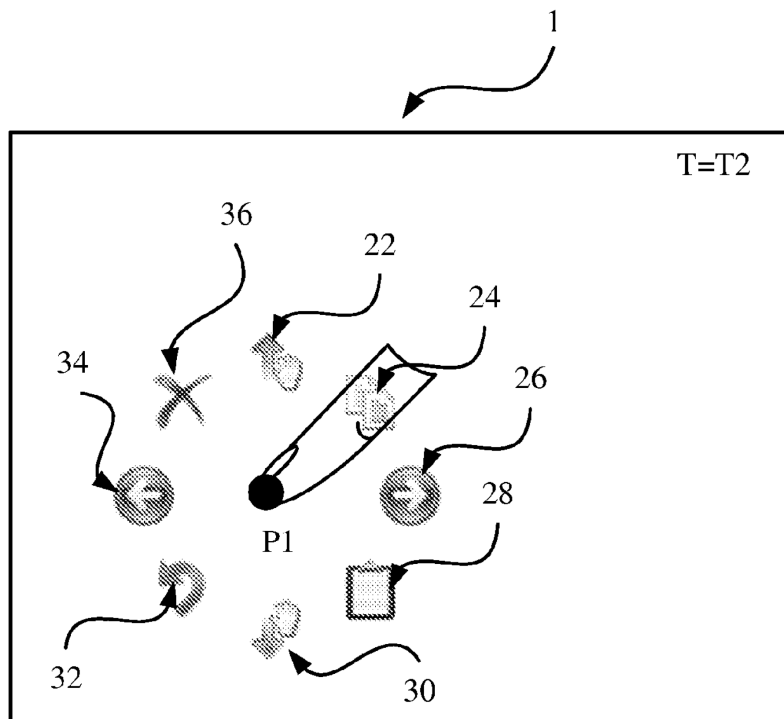


FIG. 2B

(*Id.*, Fig. 2B.) A POSITA would have understood that at least some of these menu items relate to selected objects—for example, at least the copy, forward, and delete items. (EX-1002 ¶154.) Thus, Yeh discloses displaying a list of commands a user can give with respect to the selected object or objects (e.g., copy, forward, delete) when a touch point is substantially stationary for at least a prescribed time interval. (*Id.*)

However, Yeh does not provide specific disclosure regarding how to determine whether a touch point is substantially stationary. Ording discloses that a “stationary (or substantially stationary) pressing gesture” may be detected when contact points from a user’s fingers “move[] less than a predefined amount (e.g., 1-3mm) in

a predefined time (e.g., 0.4 seconds).” (EX-1010 ¶[0326].) Consistent with Choi and Hillis, which disclose gestures that involve multiple touch points, Ording discloses that dwell or pressing gestures may be detected using more than one finger, including “by two fingers that includes contact ... by a first finger at a first location in the content and concurrent contact ... by a second finger at a second location in the content[.]” (*Id.*) Thus, Ording discloses detecting whether two touch points are substantially stationary (e.g., detecting a dwell or stationary pressing gesture) by measuring the variation in the touch points and comparing it to a prescribed allowable range (e.g., 1-3mm) for a prescribed time interval (e.g., 0.4 seconds). (*Id.*; EX-1002 ¶155.)

Ording further discloses that gestures, including two-finger gestures, may be used to display a menu containing a list of commands a user may give with respect to a selected object or objects (e.g., copy, cut, paste, undo, etc.). (EX-1010 ¶¶[0332], [0342]-[0346]; EX-1002 ¶156.) Thus, even if Yeh did not disclose displaying a menu of commands relating to selected content in response to a user’s gesture, Ording discloses that limitation. (*Id.*)

A POSITA would have been motivated to combine the teachings of Choi and Hillis (which together disclose detecting and evaluating first and second touch positions) with Yeh (which discloses displaying a contextual menu in response to a dwell

gesture) and Ording (which discloses a method for detecting a two-finger dwell gesture) to arrive at the system recited in claim 10 for several reasons. (EX-1002 ¶¶157-66.)

First, Choi suggests the combination. Choi discloses that it is advantageous to “allow[] the user to handle the objects efficiently and intuitively.” (EX-1003 ¶[0254].) A dwell gesture, which takes a small amount of time and effort (EX-1009 ¶[0033]; EX-1010 ¶[0326]; EX-1012, 2:40-57; EX-1002 ¶158), is an efficient way to summon a menu that can be intuitively used to act on selected objects. (EX-1002 ¶158.) Furthermore, detecting a dwell gesture using Ording’s method allows a user to trigger the gesture without keeping their finger perfectly steady, meaning the user can trigger the gesture intuitively and efficiently. (EX-1010 ¶[0326]; EX-1012, 2:40-57; EX-1002 ¶158.)

Second, Choi further suggests the combination because it discloses that “many variations and/or modifications of the basic inventive concepts herein taught ... will still fall within the spirit and scope of the present invention.” (EX-1003 ¶[0257]; EX-1002 ¶159.)

Third, Yeh suggests the combination. Yeh teaches using a dwell gesture to request display of a menu, but does not disclose a specific gesture detection method. (EX-1002 ¶160.) A POSITA therefore would have looked to Ording for details re-

garding how to detect such gestures. Furthermore, a POSITA would have been motivated to evaluate both the first and second touch points of Choi and Hillis for a dwell gesture (as in Yeh) using Ording’s method of detecting a two-finger dwell at least because doing so would allow the user to conveniently request display of a menu without lifting their finger from the screen. (EX-1011 ¶[0192] (gesture detected “during the touch stroke”); EX-1002 ¶160.)

Fourth, each of the references is broadly directed to improving graphical user interface responsiveness and intuitiveness for touchscreen devices. For example, Choi and Hillis are directed to systems for detecting gestures and executing commands, while Yeh and Ording focus on using multi-touch gestures to manipulate graphical elements, including repositioning. (*See* EX-1003 (Choi), Abstract; EX-1006 (Hillis), Abstract; EX-1009 (Yeh), Abstract; EX-1010 (Ording), Abstract; EX-1002 ¶161.) A POSITA would have understood that these disclosures are technically complementary and interoperable, leading a POSITA to easily combine the teachings to achieve the benefits disclosed by the references. (*Id.*)

Fifth, the combination represents merely the simple addition of one known element (Yeh and/or Ording’s two-finger dwell) to another known element (Choi’s system, as modified by Hillis) to obtain predictable results (using a two-finger dwell gesture to summon a menu). (EX-1002 ¶¶162-64); *KSR*, 550 U.S. at 417.

Sixth, the combination uses a known technique (Yeh and/or Ording’s two-finger dwell) to improve a similar device and method (Choi’s gesture system, as modified by Hillis) in the same way. (*Id.*)

Seventh, the combination applies a known technique (Yeh and/or Ording’s two-finger dwell) to a known device and method (Choi’s gesture system, as modified by Hillis) that is ready for improvement and yields predictable results (using a two-finger dwell gesture to summon a menu). (*Id.*)

A POSITA would have reasonably expected success in the modification for several reasons. (EX-1002 ¶165.) First, Choi discloses displaying a menu in response to the user “selecting a menu option” or pressing a designated key; displaying a menu in response to a dwell gesture is merely a “variation[] and/or modification[] of the basic inventive concepts herein taught” and “still fall[s] within the spirit and scope of the present invention.” (EX-1003 ¶¶[0144], [0257]; EX-1002 ¶165.) Second, dwell gestures like those disclosed in Yeh and Ording were well-known in the art, and were commonly used to trigger the display of menus. (EX-1002 ¶165 (citing EX-1006, EX-1011, EX-1009, EX-1012, EX-1010).) Furthermore, as discussed above, the combination merely represents the simple addition of a known element (a two-finger dwell gesture) to a known system (Choi’s system, as modified by Hillis). (*Id.*) Such a modification was well within the skill of a POSITA. (*Id.*; EX-1006 ¶[0031] (POSITA could choose different execution for gesture).)

Thus, Choi, Hillis, Yeh, and/or Ording disclose, or at least suggest, each limitation of claim 10, and claim 10 would have been obvious as a whole to a POSITA. (EX-1002 ¶¶151-66.)

X. GROUND 2A: CLAIMS 1, 11, AND 12 WOULD HAVE BEEN OBVIOUS OVER YACH, WESTERMAN-632, AND HILLIS.⁴

A. Claim 1

Yach discloses an electronic apparatus. (EX-1004 ¶[0001] (disclosing a “a portable electronic device”); *id.* ¶¶[0006], [0015]-[0016], [0021], [0035], Figs. 2, 5-22; EX-1002 ¶167.)

1. 1[a]: Display and 1[b]: Indicating Section

Yach discloses that the “portable electronic device includ[es] a touch screen display[.]” (EX-1004 ¶[0001], Figs. 2, 5-22; EX-1002 ¶169.) Yach’s display, including objects (e.g., selectable features 124) indicated on the display, is shown in Figure 16:

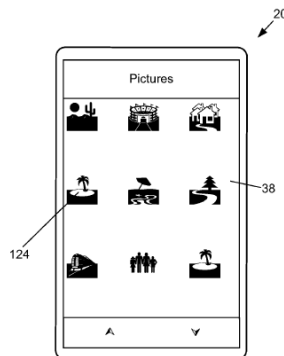


Figure 16

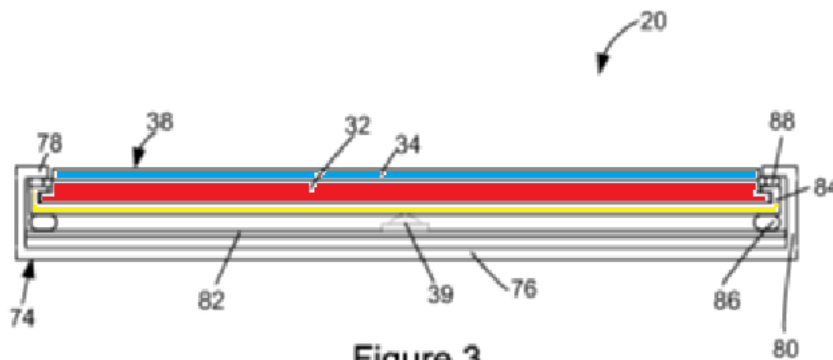
⁴ Because the claim limitations were recited in connection with Grounds 1a-1c, they are not repeated here.

(EX-1004, Fig. 16, Abstract.) Thus, Yach discloses these limitations. (EX-1002 ¶¶168-69.)

2. 1[c]: Touch Panel and 1[d]: Acquiring Section for Detecting Touches

The '487 patent admits that devices having “touch panels” that detect touches were well-known, and therefore these limitations cannot make the claim patentable. (EX-1001, 1:19-23 (touch panels are “wide spread”), 1:24-38; EX-1002 ¶170.)

Yach explains that its “display” and “touch-sensitive overlay” are “supported on a support tray[.]” (EX-1004 ¶[0037]; EX-1002 ¶172.) Yach’s Figure 3 illustrates this structure, with the touch panel annotated in blue, the display in red, and the support structure in yellow:



(EX-1004, Fig. 3; *id.* ¶¶[0035]-[0036], [0039].) Thus, Yach discloses a touch panel (blue) superposed on the display (red). (EX-1002 ¶172.)

Yach further discloses that its touch panel detects users' touches and acquires positions of those touches. For example, Yach discloses that its touch panel “detect[s] a first touch event at a first location on the touch screen display [and] detect[s] a second touch event at a second location on the touch screen display[.]” (EX-1004 ¶¶[0006].) As Yach's touch panel detects a touch, “the X and Y location [i.e. touch position] of a touch event are both determined [i.e. acquired][.]” (*Id.* ¶[0040]; *id.* ¶¶[0005]-[0007], [0042]-[0050], [0055]-[0060], [0064]-[0068], [0074]-[0080], Fig. 4; EX-1002 ¶173.)

Thus, Yach discloses these limitations. (EX-1002 ¶¶170-74.)

3. 1[e]: Selecting Section

As discussed above (*supra* §VII.A), Hillis discloses a display surface “capable of detecting when and where a user touches the display surface.” (EX-1006 ¶¶[0021], [0007]-[0008].) Based on that information, “user gestures are identified.” (*Id.*; *id.* ¶¶[0009]-[0010], [0028].) Hillis detects when “a user establishes and moves two contact locations” and in response “[v]elocities . . . are determined for each of the contact points, including magnitudes and directions[.]” (*Id.* ¶[0034].) Hillis considers the length of a “line segment S_{12} ” connecting the two contact points, $\vec{x}_1$ and $\vec{x}_2$. (*Id.* ¶[0035].) “If the length is decreasing,” the gesture is identified as a pinching motion which, in Hillis, results in an “outward zoom” command. (*Id.*; EX-1002 ¶176.)

Thus, as discussed above, Hillis discloses (1) “deciding whether or not first and second touch positions are acquired by the acquiring section” (e.g., whether a user “establishes” two contact locations), (2) “calculating a distance between the first and second touch positions” (e.g., considering the length of the line connecting positions $\vec{x}_1$ and $\vec{x}_2$), and (3) “deciding whether or not the calculated distance between the first and second touch positions decreases in accordance with the lapse of time” (e.g., determining “[i]f the length [of line segment S_{12}] is decreasing”). (*Supra* §VII.A.5; EX-1002 ¶177.)

4. 1[f]: Setting a Rectangular Area

Yach discloses that, once two touch events are detected and the X and Y locations of those touch points are determined, a rectangular area is set:

The area boundaries are then determined based on the X and Y location of the first touch event and the X and Y location of the second touch event. In the present example, the boundaries are set to form *a rectangular area* with each side of the rectangle defined by the touch event closest to each side. Thus, the uppermost touch sets the upper-most boundary while the lower-most touch sets the lower-most boundary. Similarly, each of the right and left side boundaries are set based on the right and leftmost touches. It will therefore be appreciated that each touch event sets a pair of boundaries of the rectangular area and the pair of boundaries that are set depends on the relative locations of each of the touch events.

(EX-1004 ¶[0077] (emphasis added).) The rectangular area 130 is defined by the touch points H and G as shown:

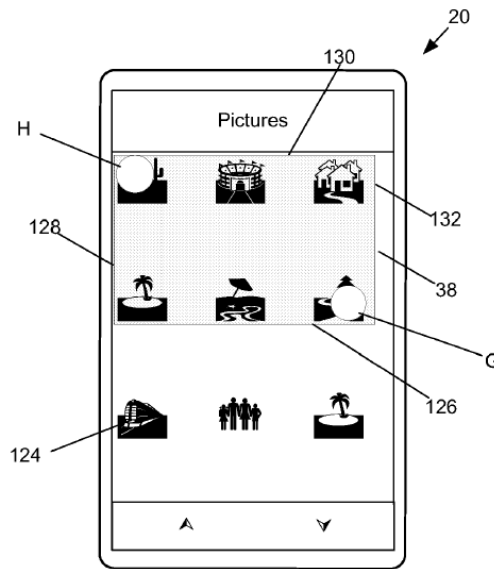


Figure 17

(*Id.*, Fig. 17; EX-1002 ¶179.)

Yach further discloses selecting object(s) contained in the rectangular area. For example, Yach discloses that “[a]ll of the thumbnails 124 that are located within the rectangular area having the boundaries 126, 128, 130, 132 are selected.” (EX-1004 ¶[0078], Fig. 17; *id.* ¶¶[0042], [0055]-[0060], [0064]-[0068].) Thus, Yach discloses setting a rectangular area and selecting object(s) inside it in response to detecting two touch points. (EX-1002 ¶180.)

Yach’s system does not require the user to make any additional gesture beyond simply touching the screen at two points. However, it would have been obvious to configure Yach’s system to set the rectangular area and select objects further

in response to determining that the distance between the two touch points is decreasing (e.g., a pinching motion) in view of Westerman-632. Westerman-632 discloses that “finger pinching, rotation and tapping gestures ... can be created to effect user commands to select an object, move an object, scroll an object, and the like.” (EX-1005 ¶[0059].) For example, Westerman-632 discloses that a user could pinch to select a file, which could then be dragged to a printer icon to print the file. (*Id.* ¶[0066]; EX-1002 ¶181.) A POSITA would have been motivated to combine the references, and would have had a reasonable expectation of success in doing so, for the reasons discussed below. (EX-1002 ¶181; *infra* §X.A.8.)

Thus, Yach and Westerman-632 disclose this limitation. (EX-1002 ¶¶178-82.)

5. 1[g]: Corners of Rectangle Coincident with Initial Touch Points

As described above, Yach discloses that “each side of the rectangle [is] defined by the touch event closest to each side.” (EX-1004 ¶[0077].) Yach further discloses that “the uppermost touch sets the upper-most boundary while the lower-most touch sets the lower-most boundary” and “each of the right and left side boundaries are set based on the right and leftmost touches.” (*Id.* ¶[0077], claim 3, Fig. 17.) Thus, even when combined with Westerman-632 and/or Hillis to set the rectangular

area in response to a pinching motion, Yach discloses that the corners of the rectangular area are set based on the initial touch points because the initial touch points necessarily define the uppermost, lowermost, rightmost, and leftmost boundaries. (EX-1002 ¶184.) Accordingly, Yach discloses this limitation. (*Id.* ¶¶183-84.)

6. 1[h]: Vectors and Angles

Hillis discloses and/or renders obvious this limitation as described above in Ground 1a. (*Supra* §VII.A.8; EX-1002 ¶185.)

7. 1[i]: Selecting Objects

Yach discloses setting the rectangular area and selecting objects. (*Supra* §X.A.4.) Westerman-632 discloses doing so in response to a pinching gesture. (*Id.*) Hillis discloses pinch gesture detection based on calculations regarding the position and direction of touch points over time, as discussed above. (*Supra* §VII.A.8.) Thus, Yach, Westerman-632, and Hillis together disclose this limitation. (EX-1002 ¶¶186-87.)

8. Motivation to Combine

A POSITA would have been motivated to modify Yach to replace Yach's static-touch gesture with Westerman-632's pinching gesture to select object(s), and would have been motivated to use Hillis's calculations to detect the pinching gesture, for several reasons. (EX-1002 ¶¶188-96.)

First, Westerman-632 suggests the combination because it teaches using a pinching gesture to select object(s) and explains that such a gesture “can allow a user to more efficiently and accurately effect intended operations.” (EX-1005 ¶¶[0007], [0027]; EX-1002 ¶189.) A POSITA would have been motivated to combine the references to achieve the benefits disclosed by Westerman-632. (*Id.*)

Second, Westerman-632 discloses using a pinching gesture to select object(s), but does not disclose detailed calculations for detecting the gesture. (EX-1002 ¶190.) A POSITA therefore would have looked to Hillis, which discloses such calculations, and would have recognized that the combination provides an easy-to-implement way of achieving a more intuitive routine for selecting objects. (*Id.*)

Third, a concern in the art at the time of the ’487 patent (and still today) was the problem of inadvertent touches. (*Id.* ¶191.) A POSITA would have been motivated to require a user to perform a pinching gesture after touching the screen to confirm the user’s intent to select objects, and would further have been motivated to implement Hillis’s calculations because they would both allow the system to more effectively reject inadvertent touches and allow for greater accuracy in determining what inputs are intended to request object selection. (*Id.*)

Fourth, the combination represents merely the simple addition of one known element (Westerman-632 and/or Hillis’s pinching gesture) to another known element (Yach’s system) to obtain predictable results (selecting objects within an area based on a pinching gesture). (*Id.* ¶¶192-94); *KSR*, 550 U.S. at 417.

Fifth, the combination uses a known technique (Westerman-632 and/or Hillis’s pinching gesture) to improve a similar device and method (Yach’s system) in the same way. (*Id.*)

Sixth, the combination applies a known technique (Westerman-632 and/or Hillis’s pinching gesture) to a known device and method (Yach’s system) that is ready for improvement and yields predictable results (selecting objects within an area based on a pinching gesture). (*Id.*)

A POSITA would have reasonably expected success in the modification for several reasons. (EX-1002 ¶195.) First, the use of a pinching gesture to manipulate objects displayed on a touch screen was well known. (*Id.*) Furthermore, Hillis’s gesture detection techniques are based on age-old geometric and mathematical concepts. (*Id.*) This would have led a POSITA to reasonably expect success implementing Westerman-632’s pinching gesture, including Hillis’s calculations, in Yach’s system. (*Id.*) Additionally, as discussed above, the combination merely rep-

resents the simple addition of a known element (a pinching gesture) to a known system (Yach’s). (*Id.*) Such a modification was well within the skill of a POSITA. (*Id.*)

Thus, Yach, Westerman-632, and Hillis disclose or render obvious each limitation of claim 1, and claim 1 would have been obvious as a whole to a POSITA. (*Id.* ¶¶167-96.)

B. Claims 11 and 12

Independent claims 11 and 12 are a method claim and a non-transitory computer-readable medium claim, respectively, that recite virtually identical limitations to those addressed above for claim 1. These limitations are disclosed by the prior art, and the claims would have been obvious to a POSITA, for the reasons discussed above. (*Supra* §§VII.B, X.A; EX-1002 ¶197.)

XI. GROUND 2B: CLAIMS 2 AND 3 WOULD HAVE BEEN OBVIOUS OVER YACH, WESTERMAN-632, HILLIS, OGAWA, AND OPTIONALLY MCGIBNEY.

As discussed above, the limitations of claim 1 are disclosed by the references in Ground 2a. (*Supra* §X.A.) Those references, Ogawa, and/or McGibney disclose the additional limitations of claims 2-3. (EX-1002 ¶¶198-211.)

A. Claim 2

As discussed above, Yach, Westerman-632, and Hillis together disclose “selecting objects” as in claim 1. (*Supra* §X.A.) Westerman-632 further discloses using

gestures to move objects that have been selected. (EX-1005 ¶[0059] (gestures “can be created to effect user commands to ... move an object”).) While Westerman-632 does not disclose exactly how to implement such a gesture, Ogawa, McGibney, and/or Hillis provide that disclosure as discussed above in Ground 1b. (*Supra* §VIII.A; EX-1002 ¶[200].)

A POSITA would have been motivated to combine the teachings of Yach, Westerman-632, Hillis, Ogawa, and/or McGibney to implement a slide-to-move gesture in Yach’s system for several reasons. (EX-1002 ¶¶[201-08].)

First, Westerman-632 suggests the combination. Westerman-632 discloses that touch gestures can be used to move objects on a touch screen (EX-1005 ¶[0059]), but does not disclose how to implement such a gesture. (EX-1002 ¶[202].) A POSITA therefore would have looked to Hillis, Ogawa, and McGibney, which disclose such methods. (*Id.*)

Second, Yach suggests the combination because it discloses that “modifications and variations [of its invention] may occur to those skilled in the art” and “are believed to be within the sphere and scope of the present disclosure.” (EX-1004 ¶[0086]; EX-1002 ¶[203].)

Third, the combination represents merely the simple addition of one known element (Ogawa and/or McGibney’s sliding gesture) to another known element (Yach’s system, as modified by Westerman-632 and Hillis) to obtain predictable

results (using a sliding gesture to move selected objects). (EX-1002 ¶¶204-06); *KSR*, 550 U.S. at 417.

Fourth, the combination uses a known technique (Ogawa and/or McGibney’s sliding gesture) to improve a similar device and method (Yach’s system, as modified by Westerman-632 and Hillis) in the same way. (*Id.*)

Fifth, the combination applies a known technique (Ogawa and/or McGibney’s sliding gesture) to a known device and method (Yach’s system, as modified by Westerman-632 and Hillis) that is ready for improvement and yields predictable results (using a sliding gesture to move selected objects). (*Id.*)

A POSITA would have reasonably expected success in the combination for several reasons. (EX-1002 ¶207.) First, Yach discloses that “modifications and variations [of its invention] may occur to those skilled in the art” and “are believed to be within the sphere and scope of the present disclosure.” (EX-1004 ¶[0086]; EX-1002 ¶207.) Second, sliding gestures as in Ogawa and McGibney were well-known in the art. (EX-1002 ¶207.) Additionally, as discussed above, the combination merely represents the simple addition of a known element (a sliding gesture) to a known system (Yach’s, as modified by Westerman-632 and Hillis). (*Id.*) Such a modification was well within the skill of a POSITA. (*Id.*)

Thus, Yach, Westerman-632, Hillis, Ogawa, and/or McGibney disclose or render obvious each limitation of claim 2, and claim 2 would have been obvious as a whole to a POSITA. (EX-1002 ¶¶199-208.)

B. Claim 3

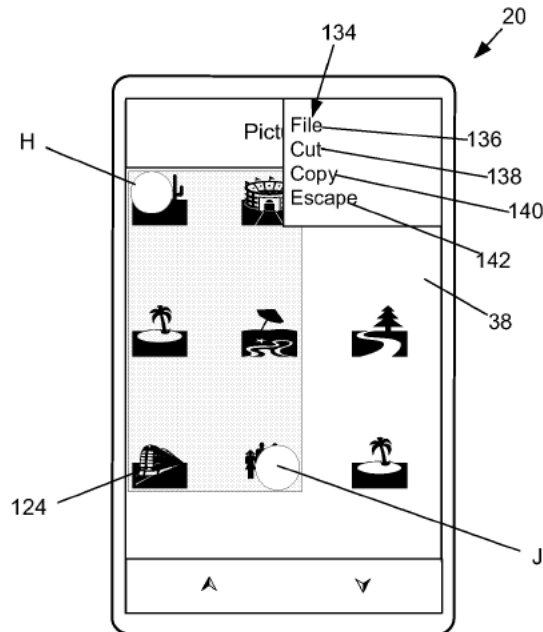
As discussed above in Ground 1b, Hillis, Ogawa, and/or McGibney disclose the additional limitations of claim 3. (*Supra* §VIII.B; EX-1002 ¶211.) A POSITA would have been motivated to combine the references' teachings, and would have had a reasonable expectation in doing so, for the reasons discussed above for Ground 1b and for claim 2 in this Ground. (*Supra* §§VIII.B, XI.A; EX-1002 ¶211.) Thus, Yach, Westerman-632, Hillis, Ogawa, and/or McGibney disclose or render obvious each limitation of claim 3, and claim 3 would have been obvious as a whole to a POSITA. (EX-1002 ¶¶209-11.)

XII. GROUND 2C: CLAIM 10 WOULD HAVE BEEN OBVIOUS OVER YACH, WESTERMAN-632, HILLIS, YEH, AND ORDING.

As discussed above, the limitations of claim 1 are disclosed by the references in Ground 2a. (*Supra* §X.A.) Those references, Yeh, and/or Ording disclose the additional limitations of claim 10. (EX-1002 ¶¶212-22.)

Yach discloses that its system can display a menu when “no further touch locations are determined” and “upon actuation of the switch 39.” (EX-1004

¶[0082].) This menu “can include any suitable options such as the options to "File" [], "Cut" [], "Copy" [] and "Escape.” (*Id.*)



(*Id.*, Fig. 22.) Yach’s menu commands relate to the selected object(s) because Yach’s system “permits selection of multiple features and operation of functions on the features as a group.” (*Id.* ¶[0085]; *see also id.* ¶[0062]; EX-1002 ¶214.)

As discussed above in Ground 1c, Yeh and Ording disclose displaying a menu upon detection of a two-finger “dwell” or “stationary pressing” gesture, and in particular show that a POSITA would have been motivated to do so in the manner recited in claim 10 with a reasonable expectation of success. (*Supra* §IX.) Those same motivations apply here. (*Id.*; EX-1002 ¶215.) A POSITA would have been

motivated to display Yach’s menu in response to such a “dwell” or “stationary pressing” gesture in the manner recited in claim 10 for several additional reasons. (EX-1002 ¶¶215-22.)

First, using a gesture such as a dwell or pause rather than Yach’s mechanical switch simplifies the device and allows the user to more efficiently and fluidly activate the menu. (EX-1002 ¶216.)

Second, Yach suggests the combination because it discloses that “modifications and variations [of its invention] may occur to those skilled in the art” and “are believed to be within the sphere and scope of the present disclosure.” (EX-1004 ¶[0086]; EX-1002 ¶217.)

Third, the combination represents merely the simple addition of one known element (Yeh and Ording’s two-finger dwell gesture) to another known element (Yach’s system, as modified by Westerman-632 and Hillis) to obtain predictable results (using a two-finger dwell gesture to summon a menu). (EX-1002 ¶¶218-20); *KSR*, 550 U.S. at 417.

Fourth, the combination uses a known technique (Yeh and Ording’s two-finger dwell gesture) to improve a similar device and method (Yach’s system, as modified by Westerman-632 and Hillis) in the same way. (*Id.*)

Fifth, the combination applies a known technique (Yeh and Ording’s two-finger dwell gesture) to a known device and method (Yach’s system, as modified by

Westerman-632 and Hillis) that is ready for improvement and yields predictable results (using a two-finger dwell gesture to summon a menu). (*Id.*)

A POSITA would have reasonably expected success in the combination for several reasons. (EX-1002 ¶221.) First, Yach discloses that “modifications and variations [of its invention] may occur to those skilled in the art” and “are believed to be within the sphere and scope of the present disclosure.” (EX-1004 ¶[0086]; *id.* ¶[0073] (disclosing alternative method for summoning menu); EX-1002 ¶221.) Second, dwell gestures like those disclosed in Yeh and/or Ording were well-known in the art, and were commonly used to trigger the display of menus. (EX-1002 ¶221 (citing EX-1006, EX-1011, EX-1009, EX-1012, EX-1010).) Furthermore, as discussed above, the combination merely represents the simple addition of a known element (a two-finger dwell gesture) to a known system (Yach’s system, as modified by Westerman-632 and Hillis). (*Id.*) Such a modification was well within the skill of a POSITA. (*Id.*)

Thus, Yach, Westerman-632, Hillis, Yeh, and/or Ording disclose or render obvious each limitation of claim 10, and claim 10 would have been obvious as a whole to a POSITA. (EX-1002 ¶¶212-22.)

XIII. SECONDARY CONSIDERATIONS OF NONOBVIOUSNESS

Where, as here, a strong *prima facie* obviousness showing exists, secondary considerations may not dislodge the obviousness conclusion. *Leapfrog Enters., Inc.*

v. Fisher-Price, Inc., 485 F.3d 1157, 1162 (Fed. Cir. 2007). Petitioners are aware of no evidence supporting a claim for secondary considerations.

XIV. CONCLUSION

Petitioners request the Board institute trial and cancel all challenged claims.⁵

XV. MANDATORY NOTICES, GROUNDS FOR STANDING, AND FEE PAYMENT

Pursuant to 37 C.F.R. §42.8(a)(1), the mandatory notices identified in 37 C.F.R. § 42.8(b) are provided below as part of this Petition.

A. Real Parties-In-Interest (37 C.F.R. §42.8(b)(1))

Amazon.com, Inc., Amazon.com Services LLC, and Amazon Web Services, Inc. are the real parties-in-interest.

B. Related Matters (37 C.F.R. §42.8(b)(2))

To the best knowledge of Petitioners, the '487 patent is or has been involved in the following district court litigations:

Name	Number	Court	Filed
<i>SoundClear Techs. LLC v. Amazon.com, Inc.</i>	1:24-cv-01283	E.D. Va.	July 25, 2024
<i>SoundClear Techs. LLC v. Google LLC</i>	3:24-cv-00540	E.D. Va.	July 25, 2024

⁵ Petitioners will address discretionary denial issues if raised by PO. See Memorandum from Acting Director Stewart, *Interim Processes for PTAB Workload Management* (March 26, 2025).

C. Lead and Backup Counsel (37 C.F.R. §42.8(b)(3))

Petitioners provide the following designation of counsel, all of whom are included in Customer No. 20,995 identified in Petitioners' Power of Attorney.

Lead Counsel	Back-up Counsel
Colin B. Heideman (Reg. No. 61,513) 2cbh@knobbe.com BoxSEAZN2L2104LP1@knobbe.com	Jeremy A. Anapol (Reg. No. 75,686) 2jaa@knobbe.com
<u>Postal and Hand-Delivery Address:</u> Knobbe, Martens, Olson, & Bear, LLP 555 110th Ave. NE, Ste. 500 Bellevue, WA 98004 Telephone: (206) 405-2000 Facsimile: (206) 405-2001	<u>Postal and Hand-Delivery Address:</u> Knobbe, Martens, Olson, & Bear, LLP 2040 Main Street, 14th Floor Irvine, CA 92614 Telephone: (949) 760-0404 Facsimile: (949) 760-9502
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D. Service Information (37 C.F.R. §42.8(b)(4))

Please direct all correspondence to lead counsel and back-up counsel at the addresses shown above. Petitioner also consents to electronic service by email to BoxSEAZN2L2104LP1@knobbe.com.

E. Grounds for Standing (37 C.F.R. §42.104(a))

Petitioners certify that the '487 patent is available for IPR and that Petitioners are not barred or estopped from requesting IPR on the identified grounds. This petition is being filed within one year of service of the original complaint against Petitioners in the district court litigation.

F. Payment of Fees (37 C.F.R. §42.103)

The Office may charge the §42.15(a) fee to Deposit Account No. 11-1410. Review of six claims is requested. Payment for any additional fees due may be charged to the above-referenced Deposit Account.

Respectfully submitted,

KNOBBE MARTENS OLSON & BEAR, LLP

Dated: July 30, 2025

/Colin B. Heideman/

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Counsel for Petitioners Amazon.com, Inc.,
Amazon.com Services LLC, and
Amazon Web Services, Inc.

APPENDIX

Listing of Claims from U.S. 11,244,675	
Claim 1	
1[pre]	An electronic apparatus comprising:
1[a]	a display;
1[b]	an indicating section for indicating objects on the display;
1[c]	a touch panel superposed on the display;
1[d]	an acquiring section for detecting user's touches to the touch panel and acquiring positions of the user's touches to the touch panel as touch positions; and
1[e]	a selecting section for deciding whether or not first and second touch positions are acquired by the acquiring section, for calculating a distance between the first and second touch positions, and for deciding whether or not the calculated distance between the first and second touch positions decreases in accordance with the lapse of time;
1[f]	the selecting section being further for setting a rectangular area with respect to the display and selecting an object or objects contained in the rectangular area in cases where it is decided that the first and second touch positions are acquired and the distance between the first and second touch positions decreases in accordance with the lapse of time;
1[g]	wherein two opposite corners of the rectangular area are respectively coincident with the first and second touch positions occurring at an initial stage of the user's touches to the touch panel;

Listing of Claims from U.S. 11,244,675	
1[h]	wherein the selecting section is for deriving a first vector extending from the first touch position occurring at a first moment to the first touch position occurring at a second moment after the first moment, for deriving a straight line connecting the first and second touch positions occurring at the first moment, for deriving a second vector extending from the second touch position occurring at the first moment to the second touch position occurring at the second moment, for calculating a first angle between the first vector and the straight line, for calculating a second angle between the second vector and the straight line, for deciding whether or not the first angle is smaller than a prescribed angle, and for deciding whether or not the second angle is smaller than the prescribed angle; and
1[i]	wherein the selecting section is for setting the rectangular area and selecting the object or objects contained in the rectangular area in cases where it is decided that the distance between the first and second touch positions decreases in accordance with the lapse of time, the first angle is smaller than the prescribed angle, and the second angle is smaller than the prescribed angle.
Claim 2	
--	The electronic apparatus as recited in claim 1, further comprising a moving section for deciding whether or not the distance between the first and second touch positions is substantially constant after the object or objects contained in the rectangular area are selected by the selecting section, for deciding whether or not the first and second touch positions are slid in substantially a same direction after the object or objects contained in the rectangular area are selected by the selecting section, and for, in cases where it is decided that the distance between the first and second touch positions is substantially constant and the first and second touch positions are slid in substantially a same direction, moving the selected object or objects along said same direction.

Listing of Claims from U.S. 11,244,675	
Claim 3	
--	The electronic apparatus as recited in claim 2, wherein the moving section is for calculating a first distance between the first and second touch positions occurring at a first moment, for calculating a second distance between the first and second touch positions occurring at a second moment after the first moment, for calculating a variation between the first distance and the second distance, for deciding whether or not the calculated variation is within a prescribed allowable range, for deriving a first vector extending from the first touch position occurring at the first moment to the first touch position occurring at the second moment, for deriving a second vector extending from the second touch position occurring at the first moment to the second touch position occurring at the second moment, for calculating an angle between the first and second vectors, for deciding whether or not the calculated angle is smaller than a prescribed angle, and for moving the selected object or objects along said same direction in cases where the calculated variation is within the prescribed allowable range and the calculated angle is smaller than the prescribed angle.
Claim 10	
--	The electronic apparatus as recited in claim 1, further comprising a menu indicating section for calculating a first variation of the first touch position after the object or objects contained in the rectangular area are selected by the selecting section, and for calculating a second variation of the second touch position after the object or objects contained in the rectangular area are selected by the selecting section, for deciding whether or not both the first and second variations remain within a prescribed allowable range for at least a prescribed time interval, and for indicating a list of commands a user can give with respect to the object or objects contained in the rectangular area in cases where it is decided that both the first and second variations remain within the prescribed allowable range for at least the prescribed time interval.

Listing of Claims from U.S. 11,244,675	
Claim 11	
11[pre]	A method of controlling an electronic apparatus, comprising the steps of:
11[a]	indicating objects on a display;
11[b]	detecting user's touches to a touch panel superposed on the display and acquiring positions of the user's touches to the touch panel as touch positions;
11[c]	deciding whether or not first and second touch positions are acquired by the detecting and acquiring step;
11[d]	calculating a distance between the first and second touch positions;
11[e]	deciding whether or not the calculated distance between the first and second touch positions decreases in accordance with the lapse of time; and
11[f]	setting a rectangular area with respect to the display and selecting an object or objects contained in the rectangular area in cases where it is decided that the first and second touch positions are acquired and the distance between the first and second touch positions decreases in accordance with the lapse of time;
11[g]	wherein two opposite corners of the rectangular area are respectively coincident with the first and second touch positions occurring at an initial stage of the user's touches to the touch panel;

Listing of Claims from U.S. 11,244,675	
11[h]	wherein the setting and selecting step comprises deriving a first vector extending from the first touch position occurring at a first moment to the first touch position occurring at a second moment after the first moment, deriving a straight line connecting the first and second touch positions occurring at the first moment, deriving a second vector extending from the second touch position occurring at the first moment to the second touch position occurring at the second moment, calculating a first angle between the first vector and the straight line, calculating a second angle between the second vector and the straight line, deciding whether or not the first angle is smaller than a prescribed angle, and deciding whether or not the second angle is smaller than the prescribed angle; and
11[i]	wherein the setting and selecting step further comprises setting the rectangular area and selecting the object or objects contained in the rectangular area in cases where it is decided that the distance between the first and second touch positions decreases in accordance with the lapse of time, the first angle is smaller than the prescribed angle, and the second angle is smaller than the prescribed angle.
Claim 12	
12[pre]	A non-transitory computer readable medium storing a computer program causing a computer to implement:
12[a]	an indicating section for indicating objects on a display;
12[b]	an acquiring section for detecting user's touches to a touch panel superposed on the display and acquiring positions of the user's touches to the touch panel as touch positions; and
12[c]	a selecting section for deciding whether or not first and second touch positions are acquired by the acquiring section, for calculating a distance between the first and second touch positions, and for deciding whether or not the calculated distance between the first and second touch positions decreases in accordance with the lapse of time;

Listing of Claims from U.S. 11,244,675	
12[d]	the selecting section being further for setting a rectangular area with respect to the display and selecting an object or objects contained in the rectangular area in cases where it is decided that the first and second touch positions are acquired and the distance between the first and second touch positions decreases in accordance with the lapse of time;
12[e]	wherein two opposite corners of the rectangular area are respectively coincident with the first and second touch positions occurring at an initial stage of the user's touches to the touch panel;
12[f]	wherein the selecting section is for deriving a first vector extending from the first touch position occurring at a first moment to the first touch position occurring at a second moment after the first moment, for deriving a straight line connecting the first and second touch positions occurring at the first moment, for deriving a second vector extending from the second touch position occurring at the first moment to the second touch position occurring at the second moment, for calculating a first angle between the first vector and the straight line, for calculating a second angle between the second vector and the straight line, for deciding whether or not the first angle is smaller than a prescribed angle, and for deciding whether or not the second angle is smaller than the prescribed angle; and
12[g]	wherein the selecting section is for setting the rectangular area and selecting the object or objects contained in the rectangular area in cases where it is decided that the distance between the first and second touch positions decreases in accordance with the lapse of time, the first angle is smaller than the prescribed angle, and the second angle is smaller than the prescribed angle.

CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. §42.24(d), the undersigned certifies that this **PETITION FOR INTER PARTES REVIEW OF CLAIMS 1-3 AND 10-12 OF U.S. PATENT NO. 9,223,487** contains 13,441 words according to the word-processing program used to prepare this paper. The foregoing word count complies with the 14,000-word type-volume limit specified by 37 C.F.R. §42.24(a)(1).

Dated: July 30, 2025

By: /Colin B. Heideman /
Colin B. Heideman (Reg. No. 61,513)
KNOBBE MARTENS OLSON & BEAR, LLP

CERTIFICATE OF SERVICE

The undersigned hereby certifies that on the date below a copy of this **PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 9,223,487** and **ACCOMPANYING EXHIBITS** are being served on July 30, 2025 via Federal Express overnight mail on counsel of record for U.S. Patent No. 9,223,487 at the Correspondence Address of record below:

Chandran Iyer
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A courtesy copy is also being served via email on counsel for the patent holder in the pending litigation:

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Dated: July 30, 2025

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