In the Matter Of:

APPLE INC. vs

SMITH INTERFACE TECHNOLOGIES

ANDREW COCKBURN, PH.D.

April 17, 2025

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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APPLE INC.,

Petitioner

v.

SMITH INTERFACE TECHNOLOGIES, LLC,

Patent Owner

_____

IPR2024-01085

U.S. Patent 10,649,580 B1

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REMOTE DEPOSITION OF

ANDREW COCKBURN, PH.D., VOLUME 2

a witness herein, called by the Patent Owner for examination, taken by and before Ann Medis, Registered Professional Reporter and Notary Public in and for the Commonwealth of Pennsylvania, via Zoom videoconference, on Thursday, April 17, 2025, commencing at 3:03 p.m. CT.

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A P P E A R A N C E S

(Participants appeared via Zoom videoconference)

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* I N D E X *

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* INDEX OF EXHIBITS *

NO. DESCRIPTION PAGE

(No deposition exhibits were marked.)

P R O C E E D I N G S

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ANDREW COCKBURN, PH.D.
having been previously duly sworn, was examined and testified as follows:

EXAMINATION (Continued)

BY MR. LICYGIEWICZ:

Q. Dr. Cockburn, you are still under oath as we're continuing the suspended yesterday due some technical issues with the Zoom.

Did you speak to anyone or communicate with anyone relative to any of your deposition testimony yesterday?

A. No.

Q. Have you had any communications with anyone about any potential deposition testimony you may be giving today?

A. No. Sorry. Can I clarify that answer? I did receive a message from Jenny regarding the timing and Zoom link for this deposition.

Q. Fair enough. I appreciate that. Let me go right into the remaining subject matter that I had from yesterday.

Dr. Cockburn, would you agree with me that a gesture has a duration associated with it?

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A. A user gesture, as I clarified yesterday, has a duration associated with it. From a systems perspective, it may only not attend to the duration of the gesture in determination of what form of gesture the data represents.

Q. I guess the short answer to the question is yes, a gesture has a duration associated with it?

A. From the perspective of the user, the gestured has a duration associated with it.

Q. From the perspective of a system, a gesture also has a duration associated with it even though the system may not act upon that duration data; correct?

A. The data that is induced on the touch sensor will be induced for a period of time. The system need not attend to the duration with which that data persists.

Q. Dr. Cockburn, would you agree with me that one of the ways to start the gesture duration is to begin a count from the time that the mobile device's screen is touched by a user?

A. One way to recognize a gesture would involve starting a count. In particular, where that count represents a clock value, that would be

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a way to assist in the recognition of a gesture by the system.

Q. And would you agree with me that one way to determine the end of the duration of a gesture is by removing the touch from a mobile screen's device, from a mobile device's screen, rather?

A. Gestures may be recognized by the system based on the breaking of contact from the touch screen, yes.

Q. You put it much more succinctly than I could have.

Another way to potentially recognize a gesture is by comparing the duration of the gesture to a predetermined time limit; is that correct?

A. Time thresholds are commonly used by systems to determine the form of gesture that is being conducted with respect to the touch screen.

Q. Those time thresholds, would you mind if I refer to those as the duration threshold? Would that be fair?

A. Sure.

Q. Let's go to paragraph 80 of your declaration, if you would.

A. I'm there. Thanks.

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Q. The first sentence you say, "A POSITA would have understood that a touch in the Ramos paper and Ramos video includes both contact with the touch screen and meeting a threshold proximity between the stylus and the touch screen."

Did I read that right?

A. You did.

Q. And threshold proximity, is that another way of stating how close the stylus gets to the touch screen before it is recognized by the system?

A. Essentially that's correct. A person of skill in the art understands that the closer the stylus, an inductive stylus gets to touch center, the magnitude of the signals associated with that stylus approach corresponds with the proximity of the stylus.

Q. Let's go over to paragraph 83 of your declaration, if you could.

A. I'm there. Thanks.

Q. Toward the middle of the paragraph, do you see where it says, quote, "Ording further suggests an aspect of a touch surpassing a threshold." And then it continues. "In particular, Ording explains that, quote,

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'inadvertent contact with the graphic may not select the graphic.'"

I'm going to stop it there, but it gives an example afterwards. Is that correct?

A. I see that, yes.

Q. So in this instance, what you're describing -- strike that.

Would it be fair to say that it is your opinion that in this case, an aspect of the touch surpasses a threshold?

A. That's included in the analysis of how limitation 1.h is met. Paragraph 84 provides further clarification and extension of examples.

Q. Dr. Cockburn, would you agree with me that surpassing a threshold is not the same as making a contact with the touch screen?

A. It depends on context. The determination of the contact can be based on the surpassing of the threshold.

Q. Let me ask it this way. Is it possible to pass a threshold of a touch screen without making contact with the touch screen?

A. Can you repeat the question, please?

Q. Is it possible to pass a threshold of a touch screen without making contact with the touch

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screen itself?
A. There are various ways in which that can be accomplished. That includes examples provided by Ramos and examples provided within the specification of the '580 patent.
Q. Dr. Cockburn, would you agree with me that a, quote, "aspect of the touch" is not the same as the touch?
A. I think an aspect of the touch relates to data associated with the touch.
Q. But an aspect of the touch is not the same thing as the touch; correct?
A. A person skilled in the art would understand that a touch comprises a set of data that distinguishes that touch. An aspect of the touch is at least one piece of that data.
Q. So in order for an aspect of the touch to become a touch, other data needs to be considered by the system. Would that be fair to say?
A. I think that characterization in the question is rather the inverse. The touch would be a superset of the data provided within an aspect of the touch.
Q. What do you mean by superset of the

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data?
A. As I said in response to an earlier question, a touch is recognized by a system by the data induced on the touch sensor. An aspect of the touch could be any piece of that data.
Q. For example, so there would be data associated with the approach to the touch screen and the passing of a threshold before the touch screen is actually touched or contacted; correct?
A. A person skilled in the art would understand that the touch data includes data related to the approach of the contact with the touch screen, data associated with the period of contact with the touch screen, the breaking of contact with the touch screen, and data associated with the leaving of the object from the touch screen at least on certain forms of touch screens.
Q. Is it your position, sir, that an aspect of a touch is the same thing as a touch?
A. I think I answered that question earlier. I'm happy to answer it again.
A touch is recognized via a set of data associated with the touch approaching, making contact with, possibly moving upon leaving the touch screen and eliminating its proximity to the

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touch screen. That's the data associated with a touch.
An aspect of the touch is any piece of the data associated with that touch.
Q. I think I'm understanding what you're saying now. So any of those four components or four aspects would be, quote, "an aspect of a touch"; correct?
A. You're limiting the data to those four. There can be other components of the data, including pressure information, tilt information, clock information and much more.
Q. All of which can be, in your opinion, aspects of the touch; correct?
A. An aspect of the touch is some form of data associated with the touch, and those would be examples.
Q. Is it your opinion, Dr. Cockburn, that an aspect of the touch is the same thing as a portion of touch?
A. Not necessarily.
Q. Bear with me one second.
Dr. Cockburn, is a portion of touch interpreted the same as an aspect of the touch?
MS. HUANG: Asked and answered.

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BY MR. LICYGIEWICZ:
Q. You can answer.
A. Not necessarily.
Q. So by saying "not necessarily," Dr. Cockburn, are you suggesting that there are some cases where a portion of touch is the same thing as an aspect of the touch?
A. A portion of the touch would include segments of the touch. An aspect of the touch is clearly directed at the data associated with a portion of touch. Specifically, the data associated with the aspect of touch must surpass a threshold in order to meet the limitation.
Q. You used a different phrase here where you said "segments of the touch."
In the context of your answer, what are you referring to as, quote, "segments of the touch"?
A. A person of skill in the art would understand a segment of the touch could be segments such as the approach of an object to the touch screen, the establishment of contact with the touch screen, the motion on a touch screen, the breaking of contact with the touch screen, the maintenance contact for a period of time with the

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touch screen, the removal of the object from the touch screen, and its removal of proximity with the touch screen.

Q. If I understood your answer, Dr. Cockburn, you are treating the word "portion" and "segment" the same; correct?

A. That seems reasonable.

Q. So it would also be reasonable to say that a portion is not the same as an aspect?

MS. HUANG: Objection. Asked and answered.

BY MR. LICYGIEWICZ:

Q. You can answer.

A. Not necessarily.

Q. That would be for the reasons we just discussed in your prior answer?

A. The prior answer I think was directed at segments or portions of touch. It wasn't directed at the distinction between portions or segments of touch and the aspect of a touch that is detected to surpass the threshold.

Q. Let me see if I can put it a simpler way.

So a portion of touch is not the same as an aspect of touch; correct?

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A. Not necessarily.

Q. You previously stated that a portion of touch would include segments of the touch. An aspect of the touch is clearly directed at the data associated with a portion of touch.

Do you recall that testimony?

A. I do.

Q. Do you stand by that testimony?

A. Yes.

Q. Let me go to -- bear with me a second.

In paragraph 89 of your declaration, you state that -- I'm starting halfway, partially in the second line there -- "A gesture includes at least the duration and a length that are used to recognize the type of gesture (e.g. a tap or a swipe)."

Do you see that?

A. I do. This is based on POSITA's understanding based on Ording.

Q. And you further state, "Ording explains that a swipe gesture would not register as a tap."

Correct?

A. I see that.

Q. And then you provided in the remainder of that sentence your opinion why a swipe gesture would not register as a tap. Is that fair to say?

A. That's fair in the context of Ording.

Q. Let's turn to paragraph 85, if you would. It's at the bottom of page 63.

A. I'm there. Thanks.

Q. In the first line you say, "Thus, in the RROD, when" -- I'm assuming that "as" should be "an aspect of the touch"; is that correct?

A. That's correct. It's a typo that I didn't spot.

Q. So let me restart the question then. I'll start in paragraph 85 of your declaration. You give two examples of an aspect of the touch, its duration or its length; correct?

A. That's correct. The previous paragraph also referred to the proximity of the stylus to the touch screen.

Q. As being an aspect of the touch; is that right?

A. The aspect of the touch is detected to surpass the threshold.

Q. And the threshold, according to your opinion in paragraph 85, examples of those are a time threshold and a distance threshold; correct?

A. Those are the examples provided there,

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and that includes the distance between the stylus and the touch screen on approach.

Q. And based on -- strike that.

Bear with me. I'm sharpening some of my material so we can make this go a little more smoother.

In paragraph 86 of your declaration, you suggest that, quote, "In light of these disclosures, in the combination, in response to determining that an aspect of the touch (e.g., a duration or distance of a touch on Ording's touch screen) surpasses a threshold (e.g., a time or distance threshold, taught or suggested by Ording) the Vernier of the Zlider, as taught by Ramos paper and Ramos video, is displayed on the touch screen."

Did I read that appropriately?

A. Yes.

Q. Let's take a look at Exhibit 1004, if we could. It's the Ramos paper reference.

A. I have it. Thanks.

Q. Dr. Cockburn, would you agree with me that Zlider does not use duration to determine whether the touch from a user is intentional or not?

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A. From my recollection, Ramos makes no direct mention of the use of time thresholds to determine accidental inadvertent contact. However, a person of skill in the art understands the touch sensor panels include technology to ignore spurious signals, including those that are transient or extremely short duration.

Q. Let me ask the question again. Zlider does not use duration to determine whether touch from the user is intentional or not; correct?

MS. HUANG: Objection. Asked and answered.

THE WITNESS: Same answer.

BY MR. LICYGIEWICZ:

Q. There is no express disclosure in the Ramos paper that describes the Zlider using duration to determine whether the touch from the user is intentional or not; correct?

A. If by express disclosure you mean explicit disclosure, there's no explicit mention of the use of time thresholds to ignore inadvertent contacts.

Q. And, sir, Zlider in the Ramos paper is also not concerned with the duration threshold,

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which we define as the period of time that touch surpasses a preset threshold; is that correct?

A. I think the answer for that question I gave a couple of questions ago.

A person skilled in the art understands that the touch sensor tablets such as those described by Ramos had built-in capabilities to ignore spurious signals.

Indeed, Ramos explicitly describes the use of some of those signal processing techniques in order to smooth and reduce the incidence of inadvertent data that misrepresents the user's intention. That's on page, PDF page 3 of Ramos.

Q. In the Ramos paper, the Zlider -- strike that.

In the Ramos paper, there's no express disclosure of a duration threshold being used in connection with the Zlider, is there?

A. Can you repeat the question, please.

Q. Sure. In the Ramos paper, there's no express disclosure of a duration threshold being used in connection with the Zlider, is there?

A. I think that's incorrect. Page 3 of Ramos includes an analysis or report of how the Zlider incorporates hysteresis functions in order

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to smooth the signals associated with the pressure sensor.

A person skilled in the art certainly understands that hysteresis functions are intended to incorporate time such that sudden changes in data, for example, are smoothed out of the signal.

Furthermore, Figure 3 of Ramos expressly discloses time on the X axis in association with the signals that are received from the pressure input device.

Q. Well, disclosure of time is different than the disclosure of a duration threshold; is it not?

A. The disclosure of time itself is not the same as the disclosure of a duration threshold. However, a person of skill in the art understands that a hysteresis function has a time window associated with it, and that time window is the period over which the smoothing function operates. A common form of smoothing a time window in a hysteresis function would be connected with a time threshold or could be connected with a time threshold.

Q. We're crossing over each other with respect to the words time and duration.

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A duration threshold is not just time, is it?

A. I think the questions was a duration threshold is not just time. If that was the question, I agree.

Q. And the terms "duration" and "time" are not necessarily interchangeable; correct?

A. They are not necessarily interchangeable. In certain contexts, they can be.

Q. Dr. Cockburn, in the context of the Ramos paper, "duration" and "time" are not interchangeable, are they?

A. I think that's a fairly odd question, but in the analysis of hysteresis functions and the disclosure of the smoothing functions associated with the hysteresis function that's used to smooth those signals, Ramos on page 3 shows time in its Figure 3, and it's using time there to exemplify the smoothing of signals, including the smoothing of signals after hysteresis.

A person of skill in the art understands that hysteresis functions have a duration associated with them where that duration is the

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period over which the smoothing, the hysteresis function applies. So time and duration in the Ramos paper's disclosures are connected.

I can't hear you. You're speaking and I can't hear you.

Q. I said I'm not disputing that they're connected, sir. What I'm saying is if you look at Figure 3, that figure has two axes, one based on time and the other based on scale.

One could not substitute the word "duration" for "time" in that context, could they?

A. Figure 3 includes a -- I would call it -- let's call it a blue line labeled after hysteresis. A person of skill in the art understands that hysteresis uses a duration window in the application of a hysteresis function.

So durations are exposed expressly to a person of skill in the art through the hysteresis function.

Q. Dr. Cockburn, the hysteresis function is plotted versus time, not versus duration; correct?

A. That is correct. The meaning of the figure is the smoothing that is accomplished by the different functions. And the smoothing incorporates a duration within the hysteresis

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function.

Q. The Ramos paper, however, does not expressly disclose a duration threshold, does it?

A. A person of skill in the art would understand that the hysteresis function discussed in Ramos includes a duration threshold.

MR. LICYGIEWICZ: Motion to strike as nonresponsive.

BY MR. LICYGIEWICZ:

Q. That wasn't the question, sir.

The question was: The Ramos paper, however, does not expressly disclose a duration threshold, does it?

MS. HUANG: Objection. Asked and answered.

BY MR. LICYGIEWICZ:

Q. You can answer.

A. No.

MR. LICYGIEWICZ: Same objection. Move to strike.

BY MR. LICYGIEWICZ:

Q. Dr. Cockburn, is the term "duration threshold" used in the Ramos paper?

A. From my recollection, there's no explicit use of the term duration threshold in the

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Ramos paper.

Q. Dr. Cockburn, there is no express disclosure of a virtual display layer in Ramos; correct?

A. I disagree with that. Figure 6 clearly shows a display layer.

Q. Ramos does not refer to Figure 6 as a virtual display layer, does it?

A. There's no explicit use of the term virtual display layer in Ramos. Figure 6 clearly shows the pressure's cursor on a layer above the contents.

Q. The Ramos paper does not expressly disclose a hover threshold, does it?

A. Can you repeat the question, please.

Q. Sure. The Ramos paper does not expressly disclose a hover threshold, does it?

A. I think that's incorrect. Ramos explicitly discloses a hover mechanism. And a person of skill in the art would understand that the hover mechanism and the tracking state such as that described in Figure 5 are identification of a hover state or a tracking state.

Q. We weren't talking about a hover state or a tracking state. We were talking about a

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hover threshold.

There is no explicit disclosure of a hover threshold in Ramos, is there?

A. I don't recall the use of the term "hover threshold" within Ramos. But a person of skill in the art certainly understands that a threshold associated with the signals from the pen of Ramos clearly communicates the use of a hover threshold.

Q. There is no discussion in Ramos of what distance would constitute the hover threshold, is there?

A. A person of skill in the art understands that as the pen or stylus approaches the touch sensor panel, the signals induced by the pen on the panel increase as the pen gets closer. The exact distance that corresponds with the surpassing of the threshold is not mentioned in Ramos. A person of skill in the art certainly understands that such a threshold exists.

Q. The term "hover threshold" is not used in Ramos, is it?

A. Same answer.

MR. LICYGIEWICZ: Strike as nonresponsive.

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BY MR. LICYGIEWICZ:
Q. Dr. Cockburn, the Ramos paper does not use the term "hover threshold," does it?
MS. HUANG: Objection. Asked and answered.
THE WITNESS: Sorry. I spoke over Jenny. Can you repeat your statement, Jenny?
MS. HUANG: Objection. Asked and answered.
BY MR. LICYGIEWICZ:
Q. You can answer.
A. I think I already answered that question.
MR. LICYGIEWICZ: Again, move to strike as nonresponsive.
BY MR. LICYGIEWICZ:
Q. Dr. Cockburn, the Ramos paper does not use the term "hover threshold," does it?
MS. HUANG: Objection. Asked and answered.
THE WITNESS: I'll repeat my previous answer, which was I believe the exact words "hover threshold" does not appear in Ramos.
However, a person of skill in the art understands that the Ramos paper and the Ramos

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video clearly disclose the use of a threshold associated with the hover state and the tracking state as shown in Figure 5 and disclosed elsewhere in the paper and the video.
MR. LICYGIEWICZ: Move to strike everything after the words "hover threshold does not appear in Ramos" as nonresponsive.
BY MR. LICYGIEWICZ:
Q. Dr. Cockburn, the Ramos paper does not disclose that a hover is a touch, does it?
A. I think that's a mischaracterization of Ramos and a person of skill in the art's understanding of Ramos.
Ramos makes clear it employs a touch screen, and it makes clear that when the stylus is within sensing proximity, a tracking capability is enabled.
Q. Dr. Cockburn, the Ramos paper does not have an express disclosure describing a hover as being a touch, does it?
A. I think that's incorrect. A person of skill in the art understands Ramos' express disclosure of the use of a touch screen and its express disclosure of the touch screen sensing proximity. A person of skill in the art

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understands the touch screen is sensing data associated with the touch of a pen or stylus.
Q. Dr. Cockburn, where in the Ramos paper does it state that a hover is a touch?
A. For instance, in the first sentence of the section Motivation and Goals on page 2, the paper states, "In our research, we are motivated by the steady technological progress in pen-enabled and..." emphasis "...touch-sensitive platforms."
It's clear to a person of skill in the art that touch-sensitive platform includes the capability to sense the approach of an object, such as an object approaching the hover threshold. The hover threshold or the use of a hover state and a tracking state is clearly disclosed in the Ramos paper as a result of data received on the, emphasis, touch-sensitive platform.
Q. Just so we aren't talking past each other, Dr. Cockburn, touch is not the same as a touch-sensitive platform, is it?
A. The purpose of a touch-sensitive platform is to sense touch. And it senses the approach of objects to the touch screen, the contact of objects on the touch screen, and the

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departure of contacts from the touch screen in certain forms of touch screens.
Q. So as I understand your answer, no, a touch is not the same as a touch-sensitive platform; correct?
MS. HUANG: Objection.
THE WITNESS: The purpose of a touch-sensitive platform is to register touches, including approach, contact and departure in certain forms of touch screens.
MR. LICYGIEWICZ: Strike as nonresponsive.
BY MR. LICYGIEWICZ:
Q. Let me ask it again.
As I understand your answer, Dr. Cockburn, a touch is not the same thing as a touch-sensitive platform; correct?
MS. HUANG: Objection. Form. Asked and answered.
MR. LICYGIEWICZ: What's the objection to form based on?
MS. HUANG: It mischaracterizes the witness' testimony.
MR. LICYGIEWICZ: Which part?
MS. HUANG: You're reading --

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MR. LICYGIEWICZ: I'm quoting right from the witness' own words here.
MS. HUANG: Sorry. I'm trying to follow. I'm not seeing how you're quoting his words, which is the basis of my objection.
MR. LICYGIEWICZ: He is talking of a touch-sensitive platform. I'm using that term in asking him simply if the term he used is the same thing as the term "touch." Does it mean the same thing? And for some reason he doesn't want to answer that question.
MS. HUANG: I believe he has. But you can ask.
MR. LICYGIEWICZ: We can disagree on that.
BY MR. LICYGIEWICZ:
Q. Dr. Cockburn, does the term touch mean the same thing as touch-sensitive platform?
A. The purpose of a touch-sensitive platform is to register touches, including approach, contact and departure in certain forms of touch screens. However, a touch is not the same thing as a touch-sensitive platform.
Q. Dr. Cockburn, there is no express disclosure in the Ramos paper of a hover being

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part of a touch, is there?
A. A person of skill in the art reading the Ramos paper and the Ramos video certainly understands that a hover state is part of the things connected with touch that Ramos' touch-sensitive platform registers.
Q. Again, Dr. Cockburn, you're not answering the question that I'm asking.
There is no express disclosure in the Ramos paper of a hover being part of a touch, is there?
MS. HUANG: Asked and answered.
BY MR. LICYGIEWICZ:
Q. You can answer.
A. I think that mischaracterizes the Ramos paper and what it communicates to a person of skill in the art.
It clearly discloses that the Ramos touch-sensitive platform registers a hover and registers a contact and registers pressure associated with that contact.
Q. Dr. Cockburn, the Ramos paper does not state that a hover is part of a touch, does it?
A. I think that mischaracterizes the Ramos paper.

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The Ramos paper describes a touch-sensitive mechanism. That touch-sensitive mechanism is clearly and explicitly described as registering a hover or tracking state as well as other contacts associated with the touch.
Q. So as I understand your testimony, sir, you're saying that the Ramos paper expressly discloses that a hover is part of a touch?
A. The Ramos paper expressly discloses a touch-sensitive mechanism that registers data associated with the approach, contact and departure of the stylus. And a person of skill in the art clearly understands these elements of data to be parts of the touch.
Q. Again, you're not answering the question that I'm asking.
Sir, you're saying that the Ramos paper expressly discloses that a hover is part of a touch?
MS. HUANG: Objection. Asked and answered.
THE WITNESS: The Ramos paper expressly discloses a touch sensing mechanism. And that touch sensing mechanism registers a hover state. A person of skill in the art, therefore,

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understands the touch data to include the recognition of a hover or tracking state.
BY MR. LICYGIEWICZ:
Q. Dr. Cockburn, is sensing proximity the same thing as touch?
A. A person of skill in the art understands that in certain forms of touch screens, data induced on the touch sensor includes data related to the approach of the contact, the contact itself and the departure of the contact. The specification of the '580 patent also makes clear that touch data includes proximity data in certain forms of touch screens.
MS. HUANG: Counsel, we've been going about an hour. I know that we're continuing from yesterday, but I thought I'd raise that in case it makes sense to break at some point soon.
MR. LICYGIEWICZ: Let's finish with these few questions here, and then we can take a short break.
MS. HUANG: Okay.
BY MR. LICYGIEWICZ:
Q. Dr. Cockburn, you'd agree with me that you can have a proximity sensor without having a touch screen; correct?

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A. Yes.
Q. Dr. Cockburn, where in the Ramos paper is the express disclosure of a hover being part of a touch?
A. The express disclosure includes the first sentence of Motivation and Goals where the Ramos paper states, "In our research, we are motivated by the steady technological progress in pen-enabled and touch-sensitive platforms."
So the work is explicitly directed to touch-sensitive platforms. A person of skill in the art understands that those touch-sensitive platforms register data associated with touches, including the approach, contact and departure of objects from the touch screen.
And Figure 5 of Ramos expressly discloses a state transition diagram associated with the data received by the touch-sensitive platform including the establishment of a tracking state which a person of skill in the art understands to also be a hover state.
MR. LICYGIEWICZ: Why don't we take a short ten-minute break.
(Recess from 4:13 p.m. to 4:25 p.m.)

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BY MR. LICYGIEWICZ:
Q. Dr. Cockburn, there is no express disclosure of a hover being an aspect of a touch in the Ramos paper, is there?
A. I disagree. I think a person of skill in the art would understand that the hover state and the tracking state described by Ramos are a result of data being induced on the touch screen, and this is a disclosure of an aspect of the touch.
Q. The Ramos paper does not use the term "aspect of a touch," does it?
A. There is no explicit use of the words "aspect of a touch" in the Ramos paper.
Q. And there is no explicit disclosure in the Ramos paper of a hover being an aspect of a touch, is there?
MS. HUANG: Objection. Asked and answered.
THE WITNESS: I think I answered that question two questions ago.
MR. LICYGIEWICZ: I move to strike that answer as nonresponsive. And I will move to strike this answer as nonresponsive either.

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BY MR. LICYGIEWICZ:
Q. So let me try it again.
Dr. Cockburn, there is no express disclosure in the Ramos paper of a hover being an aspect of a touch, is there?
MS. HUANG: Objection. Asked and answered.
BY MR. LICYGIEWICZ:
Q. You can answer.
A. Same answer.
MR. LICYGIEWICZ: Same motion to strike as nonresponsive.
BY MR. LICYGIEWICZ:
Q. Let's turn for a second to the Ramos videos, Exhibit 1005.
A. At the start of yesterday's deposition, you asked me to let you know if I changed the windows that were open on my computer system.
Q. Yes.
A. I now have QuickTime open in order to view the video.
Q. Understood. That's fine. I appreciate that.
Dr. Cockburn, the Ramos video does not expressly discuss a hover threshold, does it?

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A. The Ramos video clearly discloses the use of a hover threshold. Whether it explicitly uses the term hover threshold in the words associated with the video, I'm unsure. But the disclosure is clear that a hover threshold is used.
Q. Does -- strike that.
Dr. Cockburn, the Ramos video does not describe a hover threshold, does it?
A. From my recollection of the video, I think that is incorrect. I think it does at least disclose to the person of skill in the art that a hover threshold is used, and my recollection is that it does describe the hover or tracking state.
Q. Can you identify where in the Ramos video by time that that disclosure is made, in your opinion?
A. Sure. I'll scroll through the video. Just give me some time.
The first example I found is at the 8th second of the video.
The second example is at the 14th -- around the 14th second of the video.
The third example at around the 26th second of the video.

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Another example, 42nd second of the video.
Another example at 1 minute and 34 seconds into the video.
Another example at 3 minutes and 10 into the video.
Another example at 3 minutes and 31 seconds into the video.
Another example at 3 minutes and 34 seconds into the video.
And there may be others.

Q. Dr. Cockburn, the Ramos video does not explicitly use the phrase "hover threshold," does it?

A. I don't recall the exact words "hover threshold" being used in the Ramos video. The use of a hover threshold is clearly disclosed in the video.

Q. And in your response to my question two questions ago, the examples that you're citing are examples in which a touch pen is about to contact the touch screen; correct?

A. That's not how I would characterize the segments I referred to. I was providing examples where a tracking state or a hover state was

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obtained.

Q. Dr. Cockburn, the Ramos video does not describe a hover as being a touch; correct?

A. I would disagree with that characterization. The Ramos video clearly shows the use of a touch sensing device, and the pen is inducing signals on that touch sensing device, including during the hover state and during contact and movement on the touch screen.

Q. So if I understand what you're saying, you're stating that the video shows that a hover is the same thing as a touch?

A. The hover is being registered and detected by the touch-sensitive device.

Q. So I guess another way to say that would be, no, a hover is not the same as a touch; correct?

A. That's not my testimony. The touch-sensitive device is sensitive to the approach of a pen to the touch-sensitive device.

Q. Just so I'm clear, sir, your testimony is that a hover is the same thing as a touch; is that right?

A. In the context of the Ramos video, the touch-sensitive device is registering

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touch-related data. That touch-related data includes the proximity of the pen or stylus to the touch-sensitive device.

Q. Again, you didn't answer the question that I asked.

Your testimony is that the hover is the same thing as device in the context of the Ramos video; correct?

MS. HUANG: Objection. Form.

THE WITNESS: I think you said that my opinion is that the touch is the same as the device. That is not my opinion.

BY MR. LICYGIEWICZ:

Q. Let me rephrase that one because I did misspeak.

So your testimony, Dr. Cockburn, is that that the hover is the same thing as a touch in the context of the Ramos video; correct?

A. That's not my testimony. The hover is not the same thing as a touch. However, a hover is one of the states that the touch-sensitive device of Ramos discloses detecting.

Q. Dr. Cockburn, there is no express disclosure of a hover being part of a touch in the Ramos video, is there?

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A. I think I answered that question earlier. And I disagree.

I think there is a disclosure of the hover state being detected by the touch-sensitive device in Ramos.

Q. I don't think you answered my question. There is no express disclosure of a hover being part of a touch in the Ramos video, is there?

MS. HUANG: Objection. Asked and answered.

THE WITNESS: I think I've answered that question earlier and in response to the previous question.

BY MR. LICYGIEWICZ:

Q. So it is your position, sir, that there is an express disclosure of a hover being part of a touch in the Ramos video?

A. Yes. I can repeat my earlier answer. The motivation and goals of the Ramos paper -- sorry. Was this question directed to the video alone or was it to the Ramos --

Q. Just the video.

A. Just the video.

Q. Just the video.

A. In that case, I apologize. My earlier

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answer was directed to the paper. Half an hour ago, we were asking the same questions about the paper.

Can you repeat the question, and I will answer it with regards to the video alone?

Q. It is your position, Dr. Cockburn, that there is an express disclosure of a hover being part of a touch in the Ramos video; correct?

A. I think that's fair. A person of skill in the art viewing the Ramos video would understand that it is using a touch-sensitive device in order to register data associated with the pen. The pen is clearly an inductive pen, and it communicates data to the touch-sensitive device including hover.

Q. It is also your position, as I would assume, that a hover is an aspect of a touch as disclosed in the Ramos video; correct? Strike that.

Dr. Cockburn, is it also your position that the Ramos video discloses explicitly that a hover is an aspect of a touch?

A. I'm not certain what you mean by explicitly. If you are directing to the exact words that are recited during the video, I believe

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the words aspect of a touch do not occur in the video. However, if explicit disclosure includes what the video clearly communicates to a viewer, then a viewer -- a person of skill in the art viewing this video would clearly understand that the touch-sensitive device disclosed in the video detects data associated with the pen including its approach to the touch-sensitive device and establishment of a tracking or hover state.

Q. So, Dr. Cockburn, as I understand your testimony, your opinion is that hover is disclosed in the Ramos video as being part of a touch as well as being an aspect of a touch; correct?

A. The Ramos video clearly discloses data being induced onto the touch-sensitive device, including the approach of the pen to the surface of the device. The data associated with the pen approaching the surface of the device would constitute an aspect of the touch when -- in particular when that data exceeds a threshold associated with determining the hover state.

Q. So, Dr. Cockburn, just so I am clear, it is your testimony that hover is disclosed in the Ramos video as being part of a touch and hover is being disclosed in the Ramos video as an aspect of

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a touch; correct?

MS. HUANG: Objection. Asked and answered.

BY MR. LICYGIEWICZ:

Q. You can answer.

A. I don't see how that question is different to the previous question. So my answer remains the same.

Q. Dr. Cockburn, there is no discussion of a virtual display layer in the Ramos video, is there?

A. I disagree. I think a display layer is disclosed both by the pressure cursor and the extended markings on the Vernier in the Ramos video.

Q. Dr. Cockburn, the Ramos video does not show the use of duration to determine whether a touch from a user is intentional or not; correct?

A. The Ramos video does not explicitly show or reveal the use of a duration to ignore inadvertent contacts. However, a person of skill in the art viewing the video would understand that transient signals induced on the touch sensor are likely to be ignored by the device.

Q. Dr. Cockburn, the Ramos video does not

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disclose that the Zlider is concerned with a duration threshold; correct?

A. I think that's incorrect. From my memory, there are aspects of the interaction with the Zlider that a person of skill in the art would understand to involve the use of a duration.

These aspects include the removal of the Vernier which from memory occurs over a period of time when the contact leaves the working area of the Vernier.

Q. Dr. Cockburn, the Ramos video does not provide a detailed analysis of instances of hover, does it?

A. The Ramos video includes several segments that disclose the use of hover. I provided several references to some of those instances in one of the first questions you asked regarding the Ramos video.

I'm not sure what you mean by detailed analysis of the use of hover, but it's certainly disclosed by the Ramos video.

Q. Dr. Cockburn, turning back to the Ramos paper, it does not include a detailed analysis of hover, does it?

A. I disagree. Figure 5 provides a

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state-transition diagram that includes consideration of the tracking state and the state transitions associated with the tracking state and other portions of the Ramos paper's system, and I would characterize that as a detailed analysis.

Q. You would agree with me that in the Ramos paper, there were records -- recorded instances of hover; correct?

MS. HUANG: Objection. Form.

THE WITNESS: Can you clarify what you mean by recorded instances?

BY MR. LICYGIEWICZ:

Q. Let me ask it this way.

Dr. Cockburn, you would agree with me that in the Ramos paper, it discusses that data logs recorded instances of hover; correct?

A. Can you provide me with a reference to the use of the term data logs in the Ramos paper?

Q. I don't think I can right now.

A. If there's a pending question, I'm unable to answer it without reference to the data logs the question referred to.

Q. Dr. Cockburn, does the Ramos paper provide any data logs of hover instances?

A. Can you clarify what you mean by data

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logs?

Q. Do you know what it means to log data?

A. In a variety of contexts, I know what it means to log data.

Q. And you understand that to log data means basically to record data or have a record of data; correct?

A. In many instances, data logs refer to a persistent record of data.

Q. The Ramos paper doesn't provide a detailed analysis of any data logs associated with hover; correct?

A. Again, can you provide me with reference to this data logging that you cited as being part of the Ramos paper?

Q. Unfortunately not.

A. In that case, I don't know how to answer the question.

Q. Does the Ramos video show any data logs of hover instances?

A. I'm not sure what you're referring to when you refer to data logs.

Q. Let's use your definition of persistent recordation of data.

A. A person of skill in the art would not

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necessarily perceive the disclosures of the Ramos video as demonstrating the persistent recording of data.

Q. So in answer to the question then, it is your answer that the Ramos video does not show the persistent recording of data of hover instances; correct?

A. My use of the term persistent data emerged in order to clarify a particular form of data logging. I'm unsure why -- what relevance data logging has to the Ramos video and Ramos paper. But I believe there's no disclosure, no direct disclosure of data logging in the Ramos video.

Q. Do you also believe that there's no direct disclosure of data logging in the Ramos paper?

A. On the assumption that by data logging we're referring to the persistent recording of a particular set of data, the Ramos paper to my recollection has no explicit disclosure of persistent recording of data associated with the contacts or data induced on the touch sensor.

Q. Why don't we take a few minutes here and let me confer internally and look at my notes here

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and see if I have anything further.

A. Can I take the opportunity to clarify my previous answer?

Q. There's no pending question right now, sir.

MR. LICYGIEWICZ: Let's go off the record.

(Recess from 5:00 p.m. to 5:06 p.m.)

BY MR. LICYGIEWICZ:

Q. I've got no further questions at this time. Dr. Cockburn, I'd like to thank you for your time and appearing for this deposition and your consideration and ability to continue today in view of the issues from yesterday.

A. Thank you.

MS. HUANG: I have no redirect.

MR. LICYGIEWICZ: Thank you everybody.

(Whereupon, at 5:07 p.m., the taking of the instant deposition ceased.)

COMMONWEALTH OF PENNSYLVANIA)
COUNTY OF ALLEGHENY) SS:

C E R T I F I C A T E

I, Ann Medis, Registered Professional Reporter, RPR, CLR, CSR-WA and Notary Public within and for the Commonwealth of Pennsylvania, do hereby certify:

That ANDREW COCKBURN, PH.D., the witness whose deposition is hereinbefore set forth, was previously sworn, and that such deposition is a true record of the testimony given by such witness.

I further certify the inspection, reading and signing of said deposition were not waived by counsel for the respective parties and by the witness.

I further certify that I am not related to any of the parties to this action by blood or marriage and that I am in no way interested in the outcome of this matter.

IN WITNESS WHEREOF, I have hereunto set my hand this 29th day of April, 2025.

Notary Public

COMMONWEALTH OF PENNSYLVANIA) E R R A T A
COUNTY OF ALLEGHENY) S H E E T

I, ANDREW COCKBURN, PH.D., have read the foregoing pages of my deposition given on April 17, 2025, and wish to make the following, if any, amendments, additions, deletions or corrections:

Page	Line	Change and reason for change:
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In all other respects, the transcript is true and correct.

_____
ANDREW COCKBURN, PH.D.

_____ day of _____, 2025.

_____
Notary Public

LEXITAS
54 Friends Lane, Suite 116
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April 29, 2025
Jenny Huang, Esquire
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111 Congress Street, Suite 2000
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Re: Deposition of ANDREW COCKBURN, PH.D.
Notice of Non-Waiver of Signature
Dear Ms. Huang:
Please have the deponent read his deposition transcript. All corrections are to be noted on the Errata Sheet.
Upon completion of the above, the Deponent must affix his signature on the Errata Sheet, and it is to then be notarized.
Please forward the signed original of the Errata Sheet to Art Licygiewicz, Esquire for attachment to the original transcript, which is in his possession. Send a copy of same to all counsel.
Please return the completed Errata Sheet within 30 days of receipt hereof.
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