

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of: Michael S. Smith
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Title: DEVICES, METHODS, AND GRAPHICAL USER INTERFACES
FOR MANIPULATING USER INTERFACE OBJECTS WITH
VISUAL AND/OR HAPTIC FEEDBACK

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**PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT
NO. 10,649,580 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42**

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LIST OF EXHIBITS

APPLE-1001	U.S. Patent No. 10,649,580
APPLE-1002	U.S. Patent No. 10,649,580 File History
APPLE-1003	Declaration of Dr. Andrew Cockburn
APPLE-1004	Ramos et al., “Zliding: Fluid Zooming and Sliding for High Precision Parameter Manipulation,” <i>UIST: Proceedings of the ACM Symposium on User Interface Software and Technology</i> , 2005.
APPLE-1005	Zooming & Zliding (Gonzalo Ramos), December 28, 2007, available at https://www.youtube.com/watch?v=EcE3XBytN-U (“Ramos Video”)
APPLE-1006	US 2008/0094356 to Ording et al. (“Ording”)
APPLE-1007	Declaration of Kathryn Talbot
APPLE-1008	Gonzalo Alberto Ramos, <i>Press-Sensitive Pen Interactions</i> (2008) (Ph.D. thesis, University of Toronto) (“Ramos Thesis”)
APPLE-1009	Declaration of June Ann Munford
APPLE-1010	Webpage version of the Ramos Video, available at https://www.youtube.com/watch?v=EcE3XBytN-U
APPLE-1011	<i>Dictionary of Computing</i> , Sixth Edition (2010)
APPLE-1012	<i>Telecom Dictionary</i> , First Edition (2007)
APPLE-1013	<i>Wiley Electronical and Electronics Engineering Dictionary</i> , First Edition (2004)
APPLE-1014	<i>A Dictionary of Computing</i> , Sixth Edition (2008)

APPLE-1015	<i>The Facts on File Dictionary of Computer Science</i> , Revised Edition (2006)
APPLE-1016	U.S. Patent Pub. No. 2012/0176401 to Hayward et al. (“Hayward”)
APPLE-1017	U.S. Patent No. 7,479,949 to Jobs et al.
APPLE-1018	Bezerianos & Balakrishnan, “The Vacuum: Facilitating the Manipulation of Distant Objects,” PAPERS: Smart Interaction Techniques 2, April 2-7, 2005
APPLE-1019	Fitzmaurice et al., “Tracking Menus,” <i>UIST</i> , 2003
APPLE-1020	U.S. Patent Pub. No. 2012/0319959 to Saponas et al. (“Saponas”)
APPLE-1021	U.S. Patent No. 2012/0046071 to Brandis et al. (“Brandis”)
APPLE-1022	Declaration of Gonzalo Ramos
APPLE-1023	U.S. Patent Publication No. 2008/0316183 to Westerman et al. (“Westerman”)
APPLE-1024	U.S. Patent No. 8,164,573 to da Costa (“da Costa”)
APPLE-1025	U.S. Patent Publication No. 2012/0046071 to Brandis et al. (“Brandis”)
APPLE-1026	U.S. Patent Publication No. 2006/0026535 to Hotelling et al. (“Hotelling”)
APPLE-1027	U.S. Patent Publication No. 2006/0132457 to Rimas-Ribikauskas et al. (“Rimas-Ribikauskas”)
APPLE-1028	U.S. Patent Publication No. 2008/0024459 to Poupyrev et al. (“Poupyrev”)

- APPLE-1029 United States District Courts — National Judicial Caseload Profile (Dec. 31, 2023) | United States Courts (uscourts.gov), https://www.uscourts.gov/sites/default/files/fcms_na_distprofile1231.2023_0.pdf (last visited June 25, 2024)
- APPLE-1030 Memorandum, Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation (USPTO June 21, 2022) (“Guidance”)
- APPLE-1031 Case Management Order, Smith Interface Technologies, LLC v. Apple Inc., 3-23-cv-01187, S.D. Cal. (June 20, 2024)

LISTING OF CLAIMS

Claim 1	
[1pre]	An apparatus, comprising:
[1a]	at least one non-transitory memory;
[1b]	a touch screen;
[1c]	a camera; and
[1d]	one or more processors in communication with the at least one non-transitory memory, the touch screen, and the camera, wherein the one or more processors execute instructions stored in the non-transitory memory to cause the apparatus to:
[1e]	display, via the touch screen, a first virtual display layer including contents;
[1f]	display, via the touch screen, at least one user interface element;
[1g]	detect, via the touch screen, at least a portion of touch on the least one user interface element;
[1h]	when an aspect of the touch is detected to surpass a threshold, display, via the touch screen, a plurality of markings in a second virtual display layer that appears to have a lesser depth than the first virtual display layer,
[1i]	where at least a portion of the second virtual display layer is at least partially translucent so that at least a portion of the contents of the first virtual display layer is visible through the at least portion of the second virtual display layer;
[1j]	detect, via the touch screen, a touch movement on at least one of the plurality of marking; and

[1k]	during detection of the touch movement on the at least one of the plurality of marking in the second virtual display layer that appears to have the lesser depth than the first virtual display layer, display, via the touch screen, a movement of the markings in the second virtual display layer as a function of the touch movement; and
[11]	perform a zoom operation on the at least portion of the contents of the first virtual display layer without performing the zoom operation on the plurality of markings in the second virtual display layer, where the zoom operation correlates with the movement of the markings in the second virtual display layer, and the at least portion of the second virtual display layer is at least partially translucent so that a result of the zoom operation on the at least portion of the contents of the first virtual display layer is visible through the at least portion of the second virtual display layer.
Claim 2	
[2]	The apparatus of claim 1, wherein the apparatus is configured such that the contents of the first virtual display layer include input detected by the camera.
Claim 3	
[3]	The apparatus of claim 1, wherein the apparatus is configured such that the plurality of markings in the second virtual display layer remains displayed for at least some time in response to detection of a cessation of the touch when the aspect of the touch is detected to surpass the threshold.
Claim 4	
[4]	The apparatus of claim 1, wherein the apparatus is configured such that the plurality of markings are displayed as part of a virtual dial.
Claim 6	
[6]	The apparatus of claim 1, wherein the apparatus is configured such that the at least portion of the touch is detected to be dynamic.

Claim 7	
[7]	The apparatus of claim 1, wherein the apparatus is configured such that the touch is detected to be part of the touch movement.
Claim 8	
[8]	The apparatus of claim 1, wherein the apparatus is configured such that the touch movement is part of another touch that is separate from the touch.
Claim 9	
[9]	The apparatus of claim 1, wherein the apparatus is configured such that the aspect of the touch includes a duration aspect and the threshold includes a duration magnitude threshold.
Claim 10	
[10]	The apparatus of claim 1, wherein the apparatus is configured such that the aspect of the touch includes a distance aspect and the threshold includes a distance magnitude threshold.
Claim 17	
[17]	The apparatus of claim 1, wherein the apparatus is configured such that the movement of the markings in the second virtual display layer result in an appearance that the markings are rotating.
Claim 18	
[18]	The apparatus of claim 1, wherein the apparatus is configured such that the plurality of markings in the second virtual display layer remains displayed for at least some time in response to detection of a cessation of the touch when the aspect of the touch is detected to surpass the threshold, and the touch movement is capable of including either a pinch gesture on at least part of the contents of the first virtual display layer or a slide gesture on at least one of the plurality of markings.

Claim 19	
[19]	The apparatus of claim 1, wherein the apparatus is configured such that the at least one user interface element is displayed in the second virtual display layer.
Claim 20	
[20pre]	The apparatus of claim 1, wherein the apparatus is configured such that:
[20a]	the contents of the first virtual display layer include input detected by the camera;
[20b]	the plurality of markings in the second virtual display layer at least temporarily remain displayed after a cessation of the touch is detected when the aspect of the touch is detected to surpass the threshold;
[20c]	the plurality of markings is displayed by increasing a size of the second virtual display layer; and
[20d]	during detection of the touch movement on at least one of the plurality of markings, a magnitude of an operation is increased on the contents of the first virtual display layer, where the increase in the magnitude of the operation and the movement of the markings in the second virtual display layer both correlate with detection of a distance of the touch movement on the at least one of the plurality of markings.
Claim 22	
[22pre]	A method, comprising:
[22a]	at a device with at least one non-transitory memory, a touch screen, a camera, and one or more processors in communication with the at least one non-transitory memory, the touch screen, and the camera:
[22b]	displaying, via the touch screen, a first virtual display layer including contents;
[22c]	detecting, via the touch screen, at least a portion of touch;

[22d]	in response to an aspect of the touch being detected to surpass a threshold, displaying, via the touch screen, a plurality of markings in a second virtual display layer that appears to have a lesser depth than the first virtual display layer, where at least a portion of the second virtual display layer is at least partially translucent so that at least a portion of the contents of the first virtual display layer is visible through the at least portion of the second virtual display layer;
[22e]	detecting, via the touch screen, another touch on at least one of the plurality of marking; and
[22f]	in response to detection of the another touch on the at least one of the plurality of marking in the second virtual display layer that appears to have the lesser depth than the first virtual display layer, displaying, via the touch screen, a movement of one or more of the plurality of markings in the second virtual display layer; and
[22g]	performing a zoom operation on the at least portion of the contents of the first virtual display layer without performing the zoom operation on the plurality of markings in the second virtual display layer, where the zoom operation is performed based on the movement of the one or more of the plurality of markings in the second virtual display layer, and the at least portion of the second virtual display layer is at least partially translucent so that a result of the zoom operation on the at least portion of the contents of the first virtual display layer is visible through the at least portion of the second virtual display layer.
Claim 23	
[23]	The method of claim 22, wherein the contents of the first virtual display layer include input detected by the camera.
Claim 24	
[24]	The method of claim 23, wherein the plurality of markings in the second virtual display layer remains displayed for a limited time in response to detection of a cessation of the touch with the aspect of the touch being detected to surpass the threshold.

Claim 25	
[25]	The method of claim 23, wherein the plurality of markings are displayed as part of a virtual dial.
Claim 26	
[26]	The method of claim 23, wherein the plurality of markings are displayed as part of a slider.
Claim 28	
[28]	The method of claim 23, wherein the another touch is detected to be dynamic.
Claim 29	
[29]	The method of claim 23, wherein the touch and the another touch are detected to be part of a single continuous gesture with constant contact with the electronic device.
Claim 30	
[30]	The method of claim 23, wherein the another touch is separate from the touch in that at least one cessation of contact is detected between the touch and the another touch.
Claim 32	
[32]	The method of claim 23, wherein the aspect of the touch includes a duration aspect and the threshold includes a duration magnitude threshold.
Claim 33	
[33]	The method of claim 23, wherein the aspect of the touch includes a distance aspect and the threshold includes a distance magnitude threshold.

Claim 36	
[36]	The method of claim 35, wherein the at least portion of the touch is detected on at least one user interface element in the second virtual display layer.
Claim 41	
[41]	The method of claim 23, wherein the movement of the markings in the second virtual display layer result in an appearance that the markings are rotating.
Claim 58	
[58pre]	A non-transitory computer readable storage medium storing one or more programs, the one or more programs comprising instructions, which when executed by an electronic device with at least one non-transitory memory, a touch screen, a camera, and one or more processors, cause the electronic device to:
[58a]	display, via the touch screen, a first virtual display layer including contents;
[58b]	detect, via the touch screen, at least a portion of touch;
[58c]	in response to an aspect of the touch being detected to surpass a threshold, display, via the touch screen, a plurality of markings in a second virtual display layer that appears to have a lesser depth than the first virtual display layer, where at least a portion of the second virtual display layer is at least partially translucent so that at least a portion of the contents of the first virtual display layer is visible through the at least portion of the second virtual display layer;
[58d]	detect, via the touch screen, another touch on at least one of the plurality of marking; and

[58e]	in response to detection of the another touch on the at least one of the plurality of marking in the second virtual display layer that appears to have the lesser depth than the first virtual display layer, display, via the touch screen, a movement of one or more of the plurality of markings in the second virtual display layer; and
[58f]	perform a zoom operation on the at least portion of the contents of the first virtual display layer without performing the zoom operation on the plurality of markings in the second virtual display layer, where the zoom operation is performed based on the movement of the one or more of the plurality of markings in the second virtual display layer, and
[58g]	the at least portion of the second virtual display layer is at least partially translucent so that a result of the zoom operation on the at least portion of the contents of the first virtual display layer is visible through the at least portion of the second virtual display layer.
Claim 59	
[59]	The non-transitory computer readable storage medium of claim 58, wherein the one or more programs include instructions which, when executed by the electronic device, cause the electronic device to operate such that: the contents of the first virtual display layer include input detected by the camera.
Claim 60	
60]	The non-transitory computer readable storage medium of claim 58, wherein the one or more programs include instructions which, when executed by the electronic device, cause the electronic device to operate such that: the plurality of markings in the second virtual display layer remains displayed for a limited time in response to detection of a cessation of the touch with the aspect of the touch being detected to surpass the threshold.

Claim 61	
[61]	The non-transitory computer readable storage medium of claim 58, wherein the one or more programs include instructions which, when executed by the electronic device, cause the electronic device to operate such that: the plurality of markings are displayed as part of a virtual dial.
Claim 62	
[62]	The non-transitory computer readable storage medium of claim 58, wherein the one or more programs include instructions which, when executed by the electronic device, cause the electronic device to operate such that: the plurality of markings are displayed as part of a slider.
Claim 64	
[64]	The non-transitory computer readable storage medium of claim 58, wherein the one or more programs include instructions which, when executed by the electronic device, cause the electronic device to operate such that: the another touch is detected to be dynamic.
Claim 65	
[65]	The non-transitory computer readable storage medium of claim 58, wherein the one or more programs include instructions which, when executed by the electronic device, cause the electronic device to operate such that: the touch and the another touch are detected to be part of a single continuous gesture with constant contact with the electronic device.
Claim 67	
[67]	The non-transitory computer readable storage medium of claim 58, wherein the one or more programs include instructions which, when executed by the electronic device, cause the electronic device to operate such that: the another touch is separate from the touch in that at least one cessation of contact is detected between the touch and the another touch.

Claim 69	
[69]	The non-transitory computer readable storage medium of claim 58, wherein the one or more programs include instructions which, when executed by the electronic device, cause the electronic device to operate such that: the aspect of the touch includes a duration aspect and the threshold includes a duration magnitude threshold.
Claim 70	
[70]	The non-transitory computer readable storage medium of claim 58, wherein the one or more programs include instructions which, when executed by the electronic device, cause the electronic device to operate such that: the aspect of the touch includes a distance aspect and the threshold includes a distance magnitude threshold.
Claim 73	
[73]	The non-transitory computer readable storage medium of claim 58, wherein the one or more programs include instructions which, when executed by the electronic device, cause the electronic device to operate such that the at least portion of the touch is detected at a predetermined location and as being static where the aspect of the touch includes a duration that is detected to surpass the threshold that includes a duration magnitude threshold, and the another touch is detected to begin at the predetermined location and as being dynamic.
Claim 77	
[77]	The non-transitory computer readable storage medium of claim 58, wherein the one or more programs include instructions which, when executed by the electronic device, cause the electronic device to operate such that: the movement of the markings in the second virtual display layer result in an appearance that the markings are rotating.

Claim 82	
[82]	The non-transitory computer readable storage medium of claim 58, wherein the one or more programs include instructions which, when executed by the electronic device, cause the electronic device to operate such that: the zoom operation is performed on the at least portion of the contents of the first virtual display layer without performing the zoom operation on the plurality of markings in the second virtual display layer, so that the plurality of markings in the second virtual display layer remain displayed regardless of the zoom operation being performed.
Claim 83	
[83]	The non-transitory computer readable storage medium of claim 58, wherein the one or more programs include instructions which, when executed by the electronic device, cause the electronic device to operate such that: the zoom operation is performed on the at least portion of the contents of the first virtual display layer without performing any zoom operation on the plurality of markings in the second virtual display layer, so that at least some of the plurality of markings in the second virtual display layer remain displayed regardless of the zoom operation being performed.

I. INTRODUCTION

Apple Inc. (“Apple” or “Petitioner”) petitions for IPR of claims 1-4, 6-10, 17, 19, 22-26, 28-30, 32-33, 36, 41, 48, 58-62, 64-65, 67, 69-70, 73, 77, and 82-83. (“Challenged Claims”) of U.S. Patent No. 10,649,580 (“the ’580 patent”). As explained in this petition, there exists a reasonable likelihood that Petitioner will prevail with respect to at least one of the Challenged Claims.

The Challenged Claims are unpatentable based on teachings set forth in at least the references presented in this petition. Petitioner respectfully submits that an IPR should be instituted, and that the Challenged Claims should be canceled as unpatentable.

II. REQUIREMENTS FOR IPR UNDER 37 C.F.R. § 42.104

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

Apple Inc. certifies that the ’580 Patent is available for IPR. Petitioner is not barred or estopped from requesting this review. Petitioner was served with a complaint of infringement of the ’580 Patent less than one year ago.

B. Challenge Under 37 C.F.R. § 42.104(b) and Relief Requested

Petitioner requests an IPR of the Challenged Claims on the grounds set forth in the table shown below. Dr. Andrew Cockburn provides supporting testimony in his Declaration. APPLE-1003, ¶¶25-172.

Ground	'580 Patent Claims	Basis for Rejection
1A	1-4, 6-10, 17, 19, 22-26, 28-30, 32-33, 36, 41, 58-62, 64-65, 67, 69-70, 73, 77, 82-83	103: Ramos Paper, Ramos Video, Ording
1B	48	103: Ramos Paper, Ramos Video, Ording, Hayward

The '580 Patent claims priority to several provisional applications as early as August 5, 2011 ("Critical Date"). APPLE-1001, Cover. Petitioner does not concede that the claimed priority date is correct, but applies prior art that predates it. The references are prior art under §§102(a), 102(b), and/or 102(e).

Reference	Filing Date	Publication Date	Basis
Ramos Paper (APPLE-1004)	n/a	As early as 10/26/2005	§§102(a),(b)
Ramos Video (APPLE-1005)	n/a	12/28/2007	§§102(a),(b)
Ording (APPLE-1006)	9/4/2007	4/24/2008	§§102(a),(e)
Hayward (APPLE-1016)	3/21/2011	7/12/2012	§§102(e)

C. Claim Construction

All claim terms should be construed according to the *Phillips* standard. *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005); 37 C.F.R. §42.100. Apple submits that no claim terms need be construed to resolve issues of controversy in the present Petition. *Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d

1355, 1361 (Fed. Cir. 2011); APPLE-1003, ¶26.

III. THE '580 PATENT

A. Brief Discussion

The '580 Patent states that “[e]mbodiments of the present invention generally relate to touch screens. APPLE-1001, 1:36-37.

Claim 1 of the '580 Patent provides for a device that performs a touch-based zoom operation on some content displayed on the touchscreen, while not performing the zoom operation on other content displayed on the touchscreen. APPLE-1003, ¶¶29-30.

B. Summary of the Prosecution History of the '580 Patent

Application Serial No. 16/664,777, which issued as the '580 Patent, was filed October 25, 2019, with 30 claims. APPLE-1002, 543-696. During prosecution, the Examiner issued no rejections. *See, generally*, APPLE-1002. Rather, Applicant proposed potential claim amendments, which it discussed with the Examiner, leading to a notice of allowance on January 31, 2020, less than four months from the filing date of the application. *Id.*, 88-120.

Thus, allowance flowed a fourth month prosecution involving no Office Actions but instead signoff by the Examiner on 2,200 references cited to the Office, which omitted the Ording reference cited in the 100th column of the '755 Patent specification s. APPLE-1003, ¶¶31-33; APPLE-1001, 1-16 (listing the

references cited across the first 16 pages of the '580 patent); *see, generally*, APPLE-1002 (APPLE-1006).

Indeed, this petition addresses claim features combinations of prior art, none of which were previously considered.

IV. THE CHALLENGED CLAIMS ARE UNPATENTABLE

A. [GROUND 1A] – The Ramos Paper-Ramos Video-Ording Combination renders obvious claims 1-4, 6-10, 17, 19, 22-26, 28-30, 32-33, 36, 41, 58-62, 64-65, 67, 69-70, 73, 77, and 82-83

1. Ramos Paper (APPLE-1004)¹

(a) Ramos Paper is a Prior Art Publication

The Ramos Paper is prior art under 35 U.S.C. §§ 102(a) and (b). APPLE-1003, ¶¶34-41. It was made accessible to members of the Association for Computing Machinery (ACM), and presented at its October 26, 2005 annual Symposium on User Interface Software and Technology (UIST). APPLE-1003, ¶34.

The ACM is the world's largest education and scientific computing society, and it includes a set of Special Interest Groups (SIGs) that represent the major

¹ General descriptions provided for this and other references and combinations thereof are incorporated into each subsection and mapping of the claims that includes citations to these references.

areas of computing. APPLE-1003, ¶35; APPLE-1022, ¶3. The Special Interest Group on Computer-Human Interaction (SIGCHI) (www.sigchi.org) is the special interest group on human computer interaction. APPLE-1003, ¶35; APPLE-1022, ¶3. With over 5,000 members, SIGCHI is the leading international community of students and professionals interested in research, education, and practical applications of Human Computer Interaction (HCI). APPLE-1003, ¶¶35-36. Importantly, the noted ACM UIST conference was more than academic. APPLE-1003, ¶35; APPLE-1022, ¶4. Rather, many of the interface developments published and presented at the conference stem from industry R&D laboratories. APPLE-1003, ¶35. Indicative of this fact, both of the chairs of the 2005 UIST conference were Microsoft employees, and the authorship of papers at the conference included affiliations with IBM, Microsoft, MERL (Mitsubishi Electric Research Laboratories), and Intel. *Id.*

In addition to presentation of the paper, the ACM provided subscribing members of the ACM SIGCHI printed copies of the UIST 2005 proceedings, which included the Ramos Paper, and which interested members would regularly browse. APPLE-1003, ¶¶37-41; APPLE-1022, ¶5. That is, both attendees at the conference and subscribing members of the ACM SIGCHI were provided with copies of the Ramos Paper, illustrating that the Ramos Paper was available for dissemination. APPLE-1003, ¶37; APPLE-1022, ¶5. Both the attendees of the

ACM symposium and subscribing members of the ACM SIGCHI include members that fit the definition of a person of ordinary skill in the art (“POSITA”)². APPLE-1003, ¶41.

Moreover, in the absence of the conference, the Ramos Paper was widely disseminated and made publicly available by at least December 13, 2005, as evidenced by the librarian declaration of June Ann Munford. APPLE-1009, ¶9.

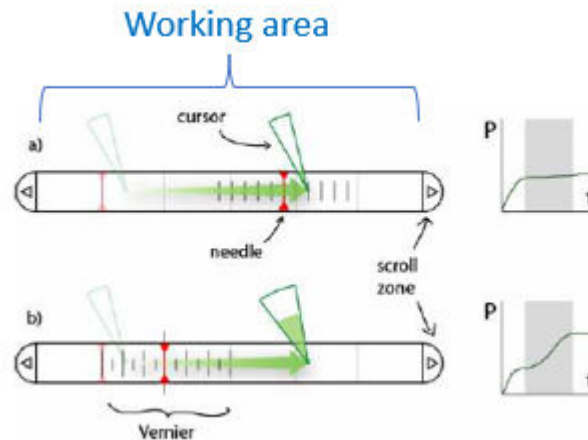
Thus, the Ramos Paper is a printed publication and/or was “otherwise available to the public” under 35 U.S.C. §§102(a)-(b). *See In re Klopfenstein*, 380 F.3d 1345, 1348 (Fed. Cir. 2004) (“[t]he statutory phrase ‘printed publication’ has been interpreted to mean that before the critical date the reference must have been sufficiently accessible to the public interested in the art.”).

(b) Overview of Ramos Paper

The Ramos Paper “introduces the notion of Zoom Sliding, or *Zliding*, for fluid integrated manipulation of scale (zooming) via pressure input while parameter manipulation within that scale is achieved via x-y cursor movement (sliding). APPLE-1004, Abstract. It describes a “Zlider,” shown below in Figure 1, “a widget that instantiates the Zliding concept.” APPLE-1004, Abstract, FIG. 1. The Ramos Paper explains that Zliding allows “users to use the pressure modality

² APPLE-1003, ¶26.

to fluidly and explicitly *zoom* or adjust the granularity of the parameter space, while *sliding* or dragging the input device to perform high precision parameter manipulation within that zoomed parameter space.” APPLE-1004, 1; APPLE-1003, ¶42.



APPLE-1004, FIG. 1 (annotated in blue)

As shown in annotated Figure 1 above, the Zlider includes a “rectangular working area that the user can scrub in order to adjust a parameter” and a Vernier, which consists of a plurality of markings, which “adapts its grid spacing depending on the widget’s current scale factor.” APPLE-1004, 1, 3, FIG. 1; APPLE-1003, ¶43.

The Ramos Paper explains its motivation by the “steady technology progress in pen-enabled and touch-sensitive platforms, where high precision manipulation tasks are made even more challenging by very small or very large physical form factors and interfaces,” such as on “a tabletPC or PDA with small screen and input

space.” APPLE-1004, 2; APPLE-1003, ¶44.

2. Ramos Video (APPLE-1005)

(a) Ramos Video is a Prior Art Publication

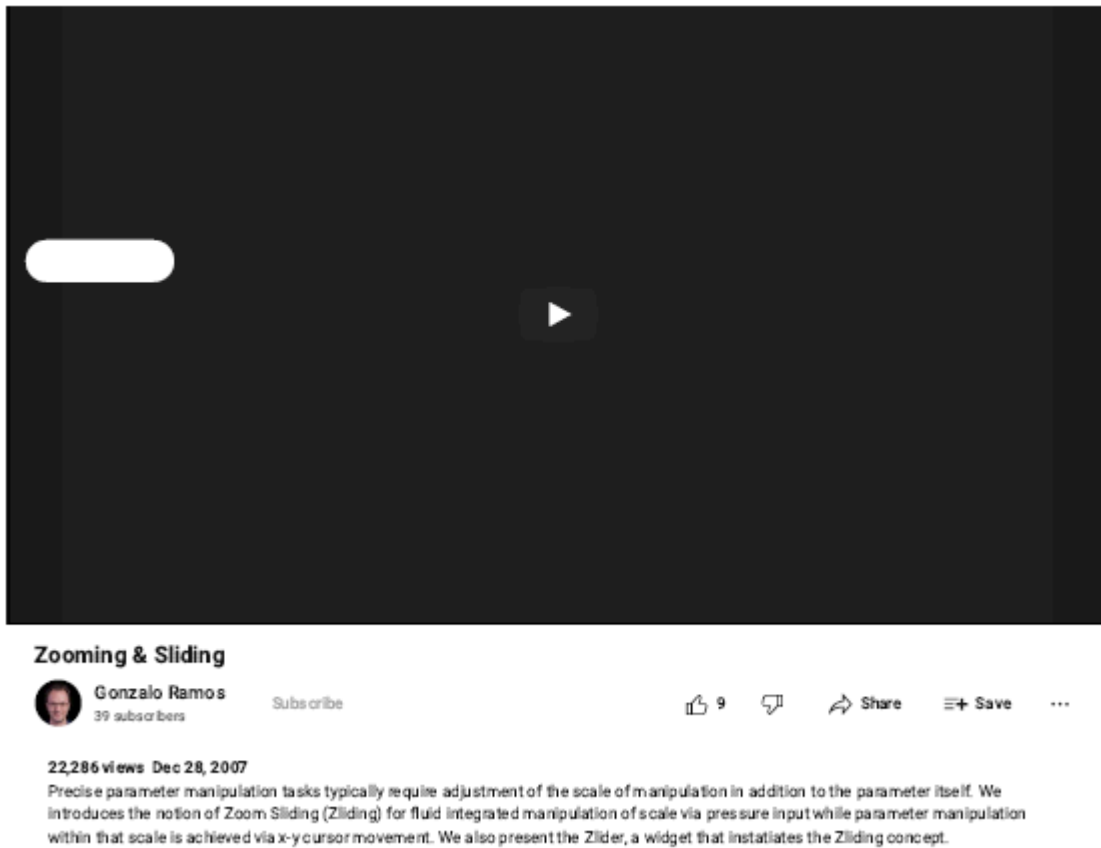
The Ramos Video was published December 28, 2007, and is prior art under 35 U.S.C. §§ 102(a) and (b). *See* APPLE-1007, ¶23; APPLE-1003, ¶45. In particular, the Ramos Video qualifies as printed publication prior art published to the popular video sharing website YouTube. The MPEP states that “[a]n electronic publication, including an online database or Internet publication (e.g., discussion group, forum, ***digital video***, or social media post), is considered to be a ‘printed publication’ within the meaning of 35 U.S.C. 102(a)(1).” MPEP § 2128(II)(A).

The Ramos Video qualifies as prior art as of the date listed on its YouTube page because YouTube videos are published by a “well-known, reputable compiler and publisher.” *Ericsson Inc. v. Intell. Ventures I LLC*, IPR2014-00527, Paper 41 at 10-11 (PTAB May 18, 2015); *see also VidStream LLC v. Twitter, Inc.*, 981 F.3d 1060, 1065-66 (Fed. Cir. 2020) (“When there is an established publisher there is a presumption of public accessibility as of the publication date.”).

The Board has concluded that YouTube videos qualify as printed publication prior art as of the publication date identified on the YouTube page for that video. For example, the PTAB has held that the publication date listed on YouTube for a particular video indicates the date when that video “was available to the public.”

Mission Integrated Tech. LLC, v. Joshua Clemente, IPR2023-01285, Paper 16 at 19, 22-23 (PTAB Feb. 23, 2024); *see also K/S HIMPP v. Bragi GmbH*, IPR2023-00901, Paper 14 at 15 (PTAB Nov. 13, 2023); *Danxiao Inf. Tech. LTD v. Shenzhen Svakom Tech. Co. LTD*, PGR2022-00050, Paper 36 at 6-7 (PTAB Jan. 19, 2024).

Furthermore, in numerous cases, Google Custodians of Record—the entity that maintains the YouTube database—have given sworn testimony that “[a]s explained on YouTube’s support website, the date listed under a video is the date it was published and, if the video was posted publicly, that is the date on which it became available to anyone for viewing.” *See, e.g., London Luxury LLC v. E&E Co., Ltd.*, PGR2021-00083, Ex. 1013; *see also id.*, Ex. 1014 at 1 (“When you make a video public on YouTube, the date on the watch page is based on Pacific Standard Time (PST). If you want a certain date to show beneath your video, upload your video on that date.”), Ex. 1015. And here, specifically, expert testimony from Kathryn Talbot confirms that the Ramos Video qualified as a printed publication since 2007. Ms. Talbot’s testimony confirms that “Exhibit APPLE-1005 is a true and correct copy, in MP4 format, of the video located at the URL www.youtube.com/watch?v=EcE3XBytN-U” (APPLE-1007, ¶¶2, 14-15) and that this video was “accessible at the same YouTube URL on the upload date,” December 28, 2007. APPLE-1007, ¶¶2, 20, 23. The YouTube page that hosts the Ramos Video confirms this December 28, 2007 publication date:



APPLE-1010, 1

Ms. Talbot further indicated that, in her experience, “the unique video identifier originally assigned to a video when it is first uploaded does not change while the video remains accessible on YouTube,” which “allows users to access each video using the same URL from the time the video is uploaded to YouTube to the time the video is removed from YouTube.” APPLE-1007, ¶16; *see id.*, ¶¶19-20. Thus, from the time the Ramos Video “was uploaded to YouTube until the present (given that the video has not been removed) the video has been accessible at the same URL: www.youtube.com/watch?v=EcE3XBytN-U.” *Id.*

Dr. Ramos further offers testimony indicating that he uploaded the Ramos Video to his YouTube channel on December 28, 2007, having often uploaded videos to YouTube relating to his academic work. APPLE-1022, ¶8. He further testified that, to his knowledge, no one else had access to modify his YouTube channel, and, that after uploading the Ramos Video, to this date, he has never modified it or removed it from YouTube. APPLE-1022, ¶¶8-9. He further included the URL for the Ramos Video in his 2008 Ph.D. thesis on several occasions, further enabling an interested party to easily find and access the Ramos Video. APPLE-1022, ¶11.

Federal courts have similarly held that such YouTube “videos meet the definition” of “a printed publication.” *HVLPO2, LLC v. Oxygen Frog, LLC*, 2018 U.S. Dist. LEXIS 245874, *1-2 Case No. 4:16cv336-MW/CAS (N.D. Fla., May 28, 2018). With respect to YouTube specifically, at least one federal court has found that:

A familiar user would know that you don't need to search for a particular channel to watch the videos uploaded on it. For example, if you want to watch a video of a cat skateboarding, you can search ‘cat skateboarding’; you don't need to know that it might have been ‘CatLady83’ who uploaded the video you end up watching.

Id., *3. The “effort involved in composing a basic search query and scrolling down the page a few times does not exceed the ‘reasonable diligence’ that the law

expects of a hypothetical prior-art subject.” *Id.*, *3-4. As explained further below—in particular, in view of the testimony of Ms. Talbot, Dr. Cockburn, and Dr. Ramops, “someone interested and ordinarily skilled in the pertinent art, exercising reasonable diligence, would have been able to locate” the Ramos Video as of its publication date on YouTube. *Id.*; *see, generally*, APPLE-1007; APPLE-1022; APPLE-1003.

Testimony from both Ms. Talbot and Dr. Cockburn confirm that a POSITA and other interested members of the public would have been able to find the Ramos Video through the exercise of reasonable diligence, such as by performing basic keyword searches using YouTube’s search functionality and browsing pages dedicated to the relevant technology. APPLE-1007, ¶¶17, 21-23; APPLE-1003, ¶46. As Dr. Cockburn testifies, “persons of ordinary skill in the art during the relevant time frame would have been well-aware of YouTube and would have turned to YouTube to find information on the latest developments in graphical user interfaces and human-computer interaction,” such as by “performing keyword searches or viewing the channels of users who regularly publish videos related to these topics.” APPLE-1003, ¶46. Moreover, SIGCHI members and attendees of the ACM UIST conference in 2005 would have been aware of Dr. Ramos’s Zlider innovation and interested parties would have and could have performed keyword searches relating to Dr. Ramos’s Zlider widget, yielding the Ramos Video. *Id.*

(b) Overview of Ramos Video

The Ramos Video illustrates the use and functionality of the Zlider described in the Ramos Paper. *See, generally*, APPLE-1005; APPLE-1009. Indeed, one of the co-authors of the Ramos Paper, Gonzalo Ramos uploaded the Ramos Video to YouTube in 2007. *Id.*; APPLE-1003, ¶47.

The Ramos Video shows several examples of content being displayed on a touch screen with the Zlider widget (e.g., working area) overlaying the content. APPLE-1003, ¶48.

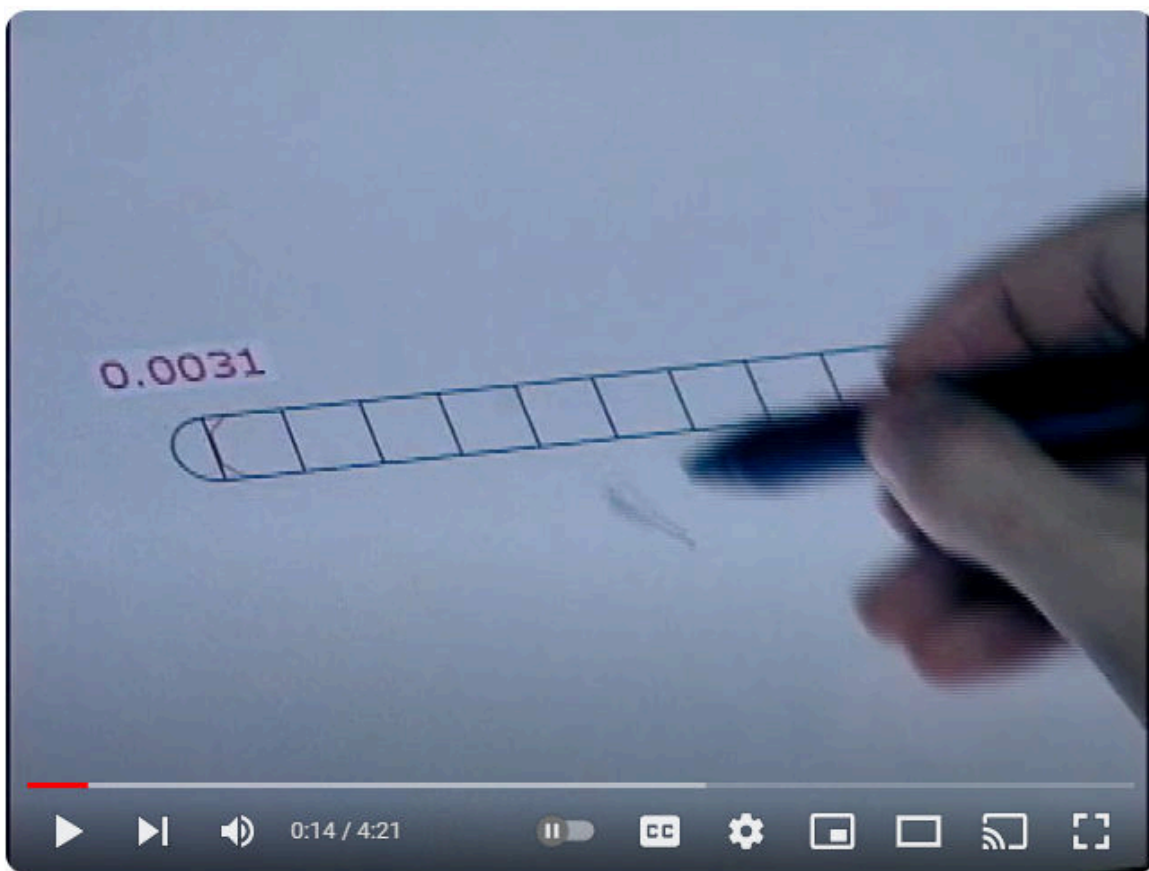


APPLE-1005, 3:22 (annotated)

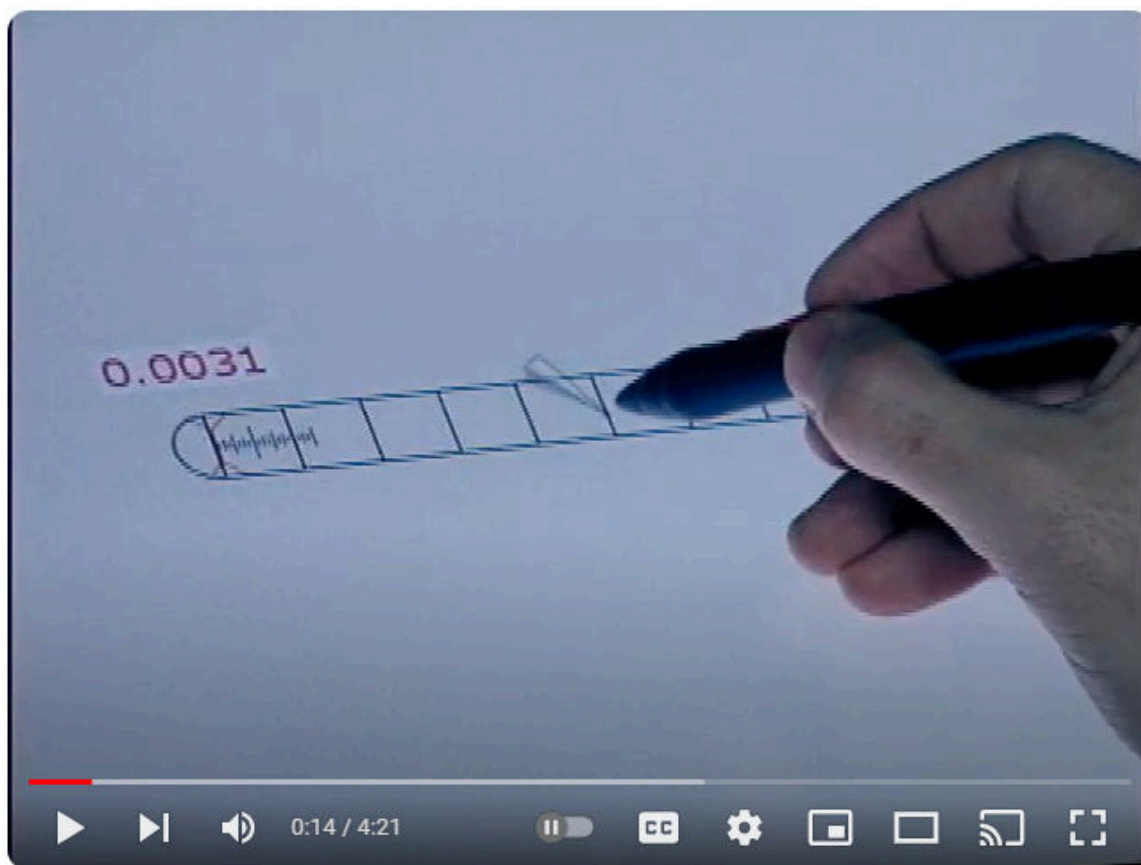


APPLE-1005, 0:03 (annotated)

As displayed above, the Vernier (with its plurality of markings) does not appear in the working area of the Zlider until the stylus is within a certain proximity of the touch screen. *Compare* APPLE-1005, 0:03, *with* 3:22; APPLE-1003, ¶49. This is further illustrated below at 0:14 of the Ramos Video:



APPLE-1005, 0:14 (displaying the touch screen before a touch is detected on the working area)



APPLE-1005, 0:14 (displaying the touch screen after a touch is detected on the working area, as evidenced by the appearance of the Vernier on the working area)

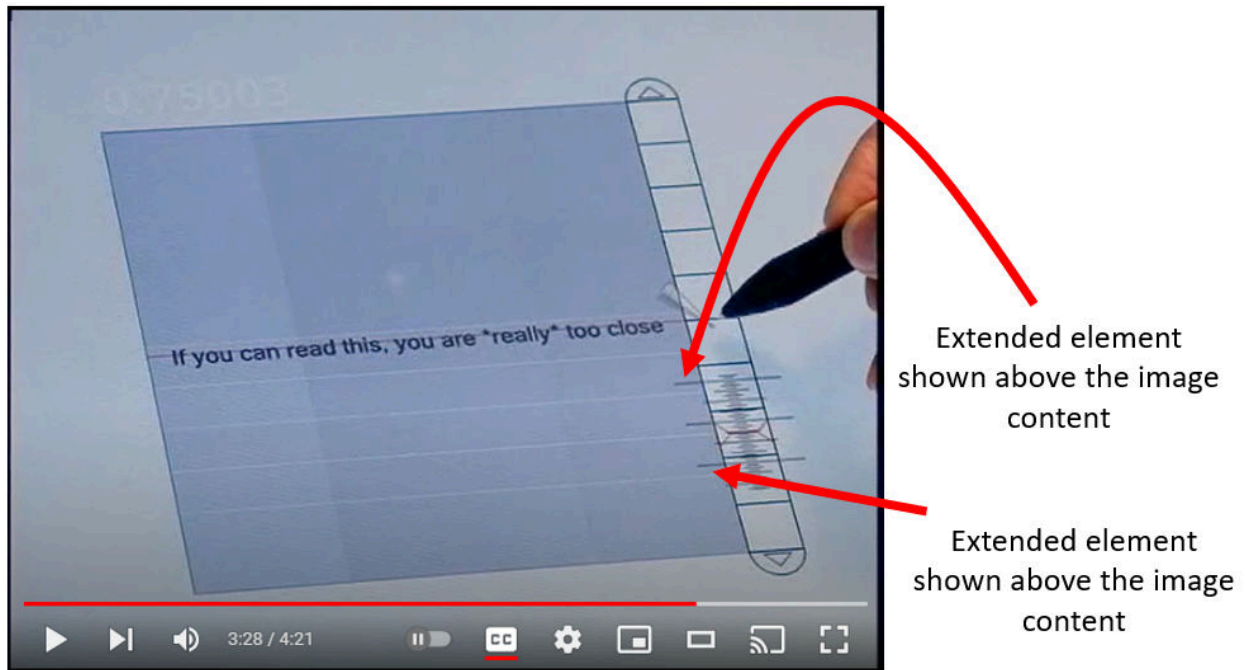
See also APPLE-1005, 3:10-3:11.

The Ramos Video also shows how the Zlider widget is displayed over the image content. APPLE-1003, ¶50. For example, in the image shown below, at least a portion of the Zlider widget (e.g., the wedge-shaped pressure cursor) is at least partially transparent. *Id.*; APPLE-1005, 0:03.



APPLE-1005, 0:03 (annotated)

In another example, as shown below, the portions of the Vernier of the Zlider widget extend beyond the rectangular working space, overlaying the image content below it. APPLE-1005, 3:28; APPLE-1003, ¶51.

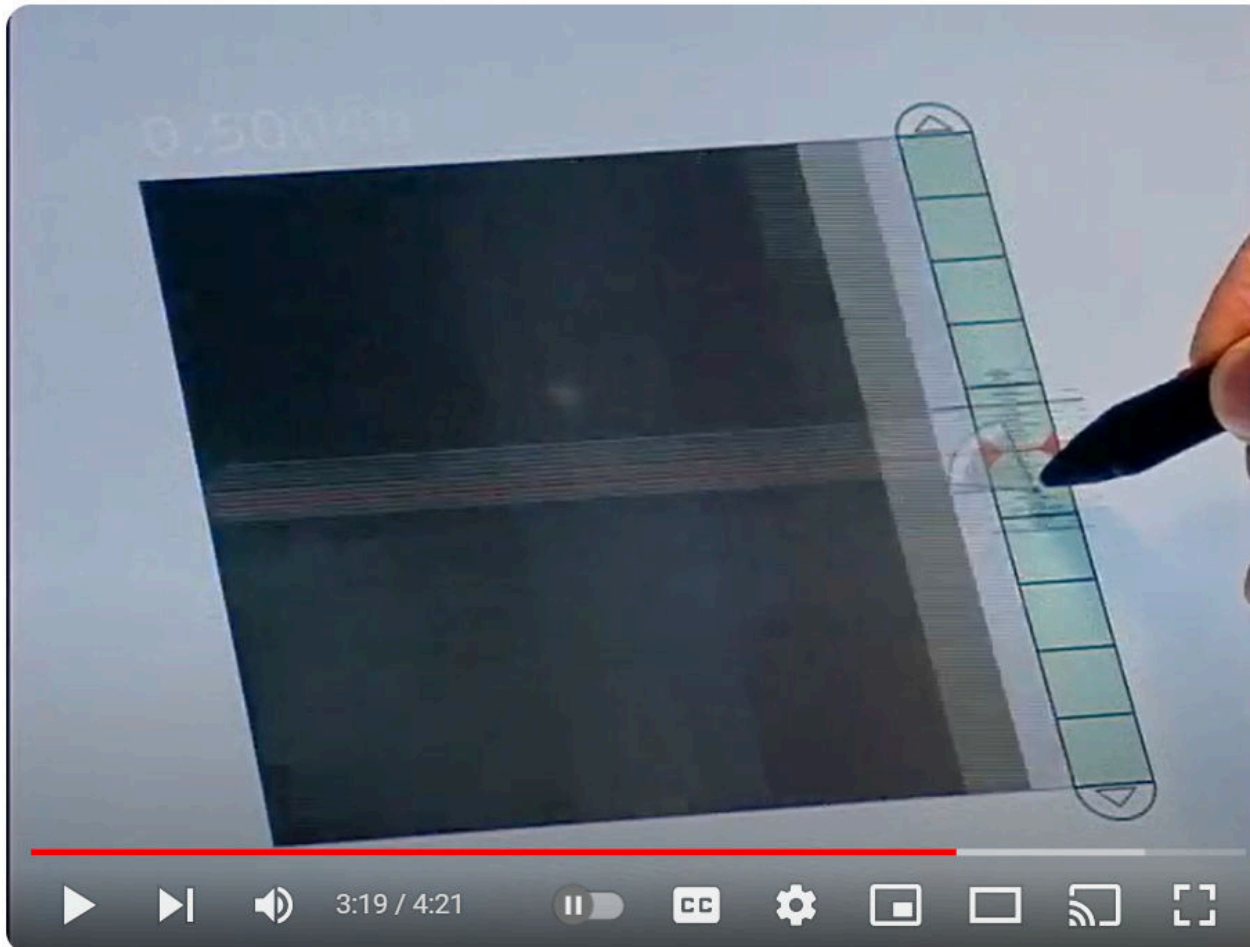


APPLE-1005, 3:28 (annotated)

The Ramos Video further illustrates how the Zlider can be used for zooming and panning. APPLE-1003, ¶52. For example, the Ramos Video first shows that touching the markings and pressing on the touch screen with different pressure causes the markings of the Zlider to move, relative to one another, and causes a zooming action on the underlying image content. APPLE-1005, 3:07-3:32; *see also id.*, 0:14-0:27. This is further illustrated below at 3:16 and 3:19.

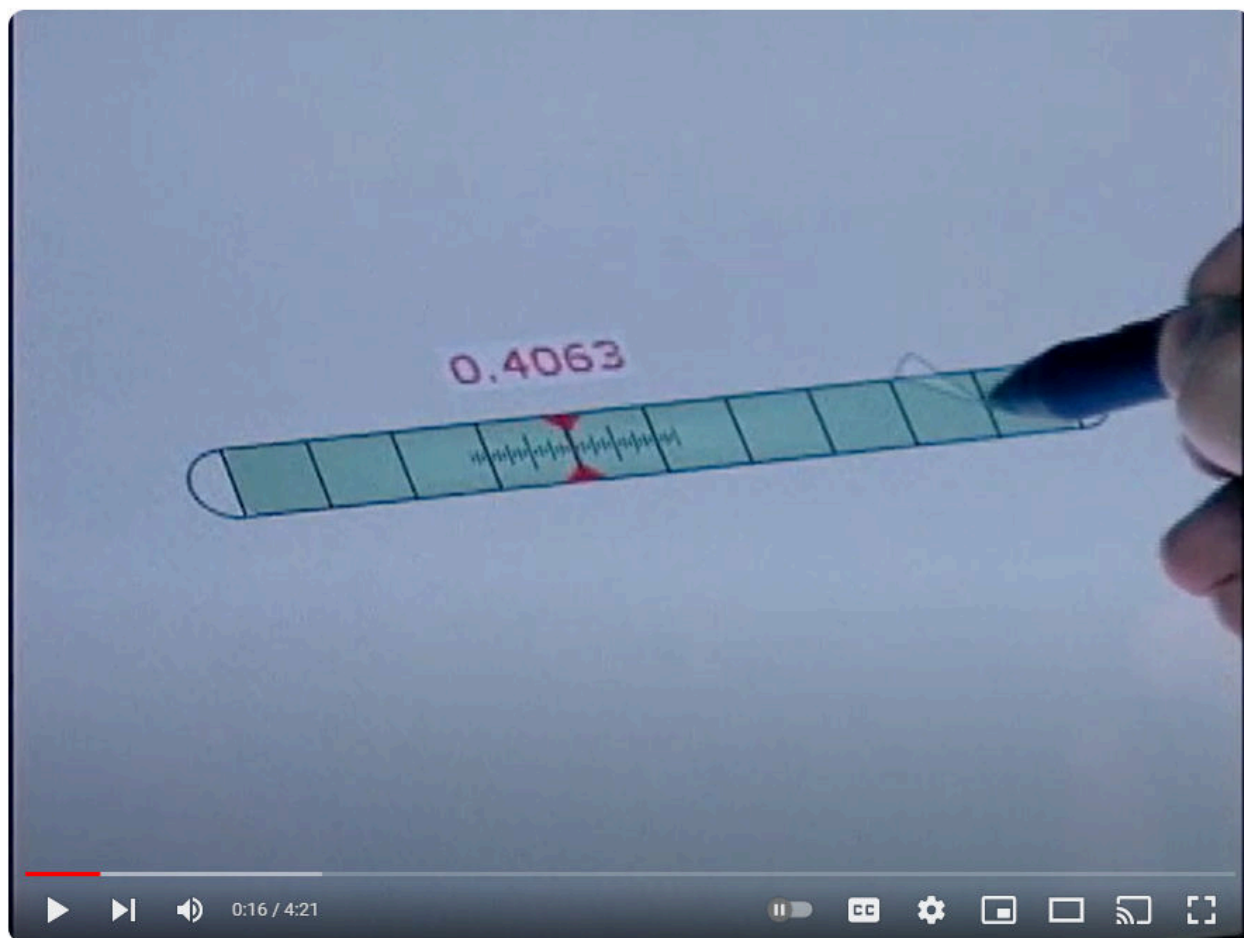


APPLE-1005, 3:16

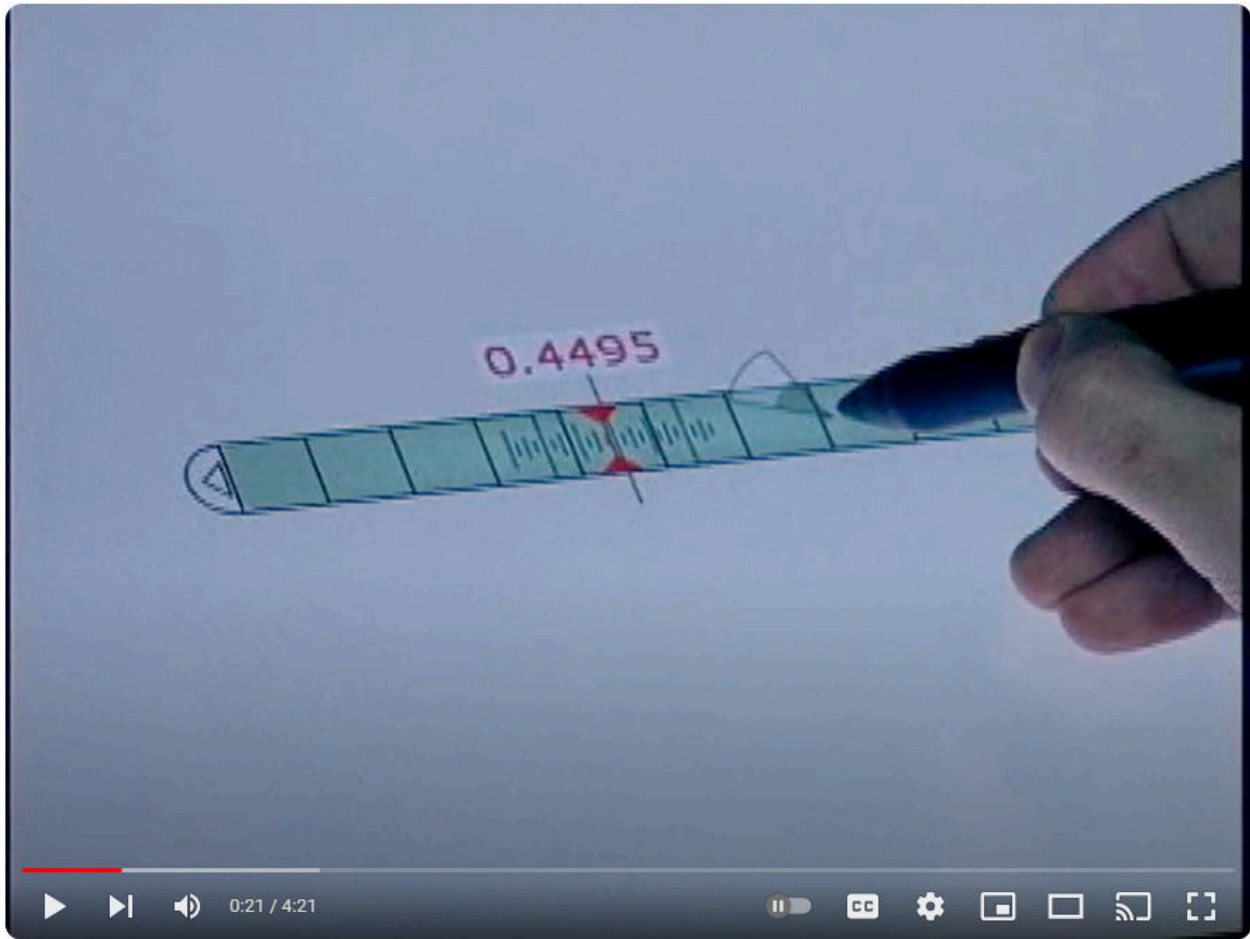


APPLE-1005, 3:19

Additionally, the Ramos Video illustrates how changing the pressure applied to the touchscreen (visually indicated by the pressure cursor size and shape) causes movement of the markings relative to one another. APPLE-1005, 0:14-0:27. In particular, the Ramos Video explains, “The Zlider also displays a Vernier, which adapts its grid spacing depending on the widget’s current position.” *Id.*, 0:53-1:00; APPLE-1003, ¶53.



APPLE-1005, 0:16 (pressure cursor indicating little to no pressure applied)



APPLE-1005, 0:21 (pressure cursor indicating a medium level of pressure applied)

3. Ording (APPLE-1006)

Ording is directed to a “portable device with a touch screen display [that] detects a contact area of a finger with the touch screen display and then determines a first position associated with the contact area.” APPLE-1006, Abstract. The portable devices described in Ording are “multifunction devices,” which include various components, including “a memory 102 (which may include one or more computer readable storage mediums), a memory controller 122, one or more

processing units (CPU's) 120, a peripherals interface 118, RF circuitry 108, audio circuitry 110, a speaker 111, a microphone 113, an input/output (I/O) subsystem 106, other input or control devices 116, and an external port 124.” shown below in Figure 1b. *Id.*, [0030]. Additionally, it can include one or more optical sensors 164, which, “[i]n conjunction with an imaging module 143 (also called a camera module), ... may capture still images or video.” *Id.*, [0030], [0047]; APPLE-1003, ¶54.

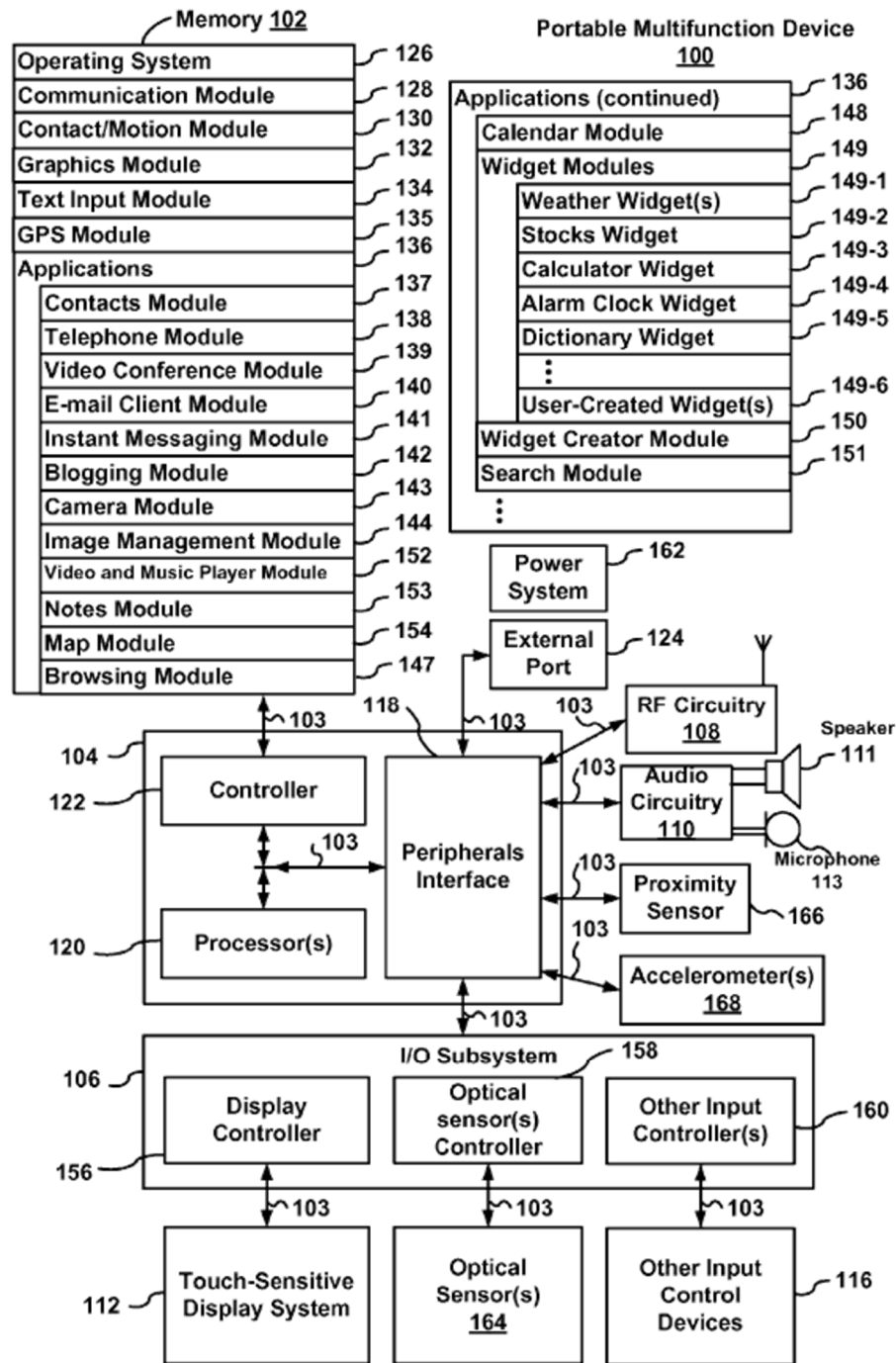


Figure 1B

APPLE-1006, FIG. 1b

Ording further explains that the device can “include a physical or virtual

click wheel as an input control device 116.” APPLE-1006, [0045]. “For a virtual click wheel, the click wheel may be either an opaque or semitransparent object that appears and disappears on the touch screen display in response to user interaction with the device. In some embodiments, a virtual click wheel is displayed on the touch screen of a portable multifunction device and operated by user contact with the touch screen.” *Id.*; APPLE-1003, ¶55.

4. The Ramos Paper-Ramos Video-Ording Combination

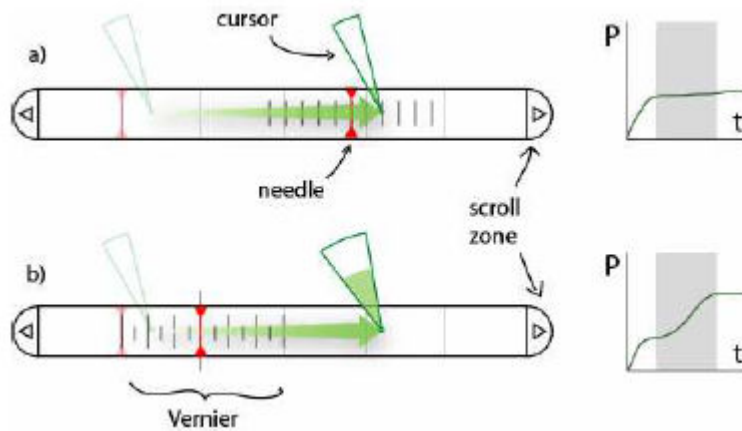
The Ramos Paper introduces the concept of the Zlider widget for zoom-sliding. APPLE-1004, Abstract. In doing so, it allows “users to use the pressure modality to fluidly and explicitly *zoom* or adjust the granularity of the parameter space, while *sliding* or dragging the input device to perform high precision parameter manipulation within that zoomed parameter space.” APPLE-1004, 1. While the Ramos Paper shows images of the Zlider widget and describes its functionality, it has only limited disclosure relating to implementation of the Zlider, including Zlider appearance and the impact of its implementation on the appearance of the underlying image content. APPLE-1003, ¶56. As such, a POSITA, familiar with the Ramos Paper, would have naturally looked to similar publications relating to the Zlider widget to fully understand the Zlider, including other publications from Dr. Ramos relating to the Zlider, such as the Ramos Video or Dr. Ramos’s Thesis (“Ramos Thesis”), the latter having referenced and included

the URL for the Ramos Video. *Id.*; APPLE-1008, 15, 113, 114, 117, 121, 136.

The Ramos Video demonstrates the use of the Zlider widget, showing how it can be used to zoom and pan underlying image content. *See, generally*, APPLE-1005. It further shows how at least a portion of the Zlider widget (e.g., pressure cursor, extended markings of the Vernier) is displayed in a semi-transparent manner such that content behind the Zlider remains visible through at least a portion of the Zlider. APPLE-1005, 0:13-0:26, 3:08-3:31. The combined disclosures of the Ramos Paper and the Ramos Video would have informed a POSITA about the operation and appearance of the Zlider, including how its use modifies the appearance of the underlying image content the Zlider was being used to adjust. APPLE-1003, ¶57; *see, generally*, APPLE-1004; APPLE-1005.

Thus, a POSITA would have considered the Ramos Paper and the Ramos Video together to fully understand functionality of the Zlider widget. APPLE-1003, ¶58. The combined disclosures of the Ramos Paper and the Ramos Video thus combine to inform various details of the Zlider widget, including its physical appearance (including a Vernier), as shown in the Ramos Paper below, and its applications (e.g., allowing “users to use the pressure modality to fluidly and explicitly *zoom* or adjust the granularity of the parameter space, while *sliding* or dragging the input device to perform high precision parameter manipulation within that zoomed parameter space”), as well as its use in practice, including the changes

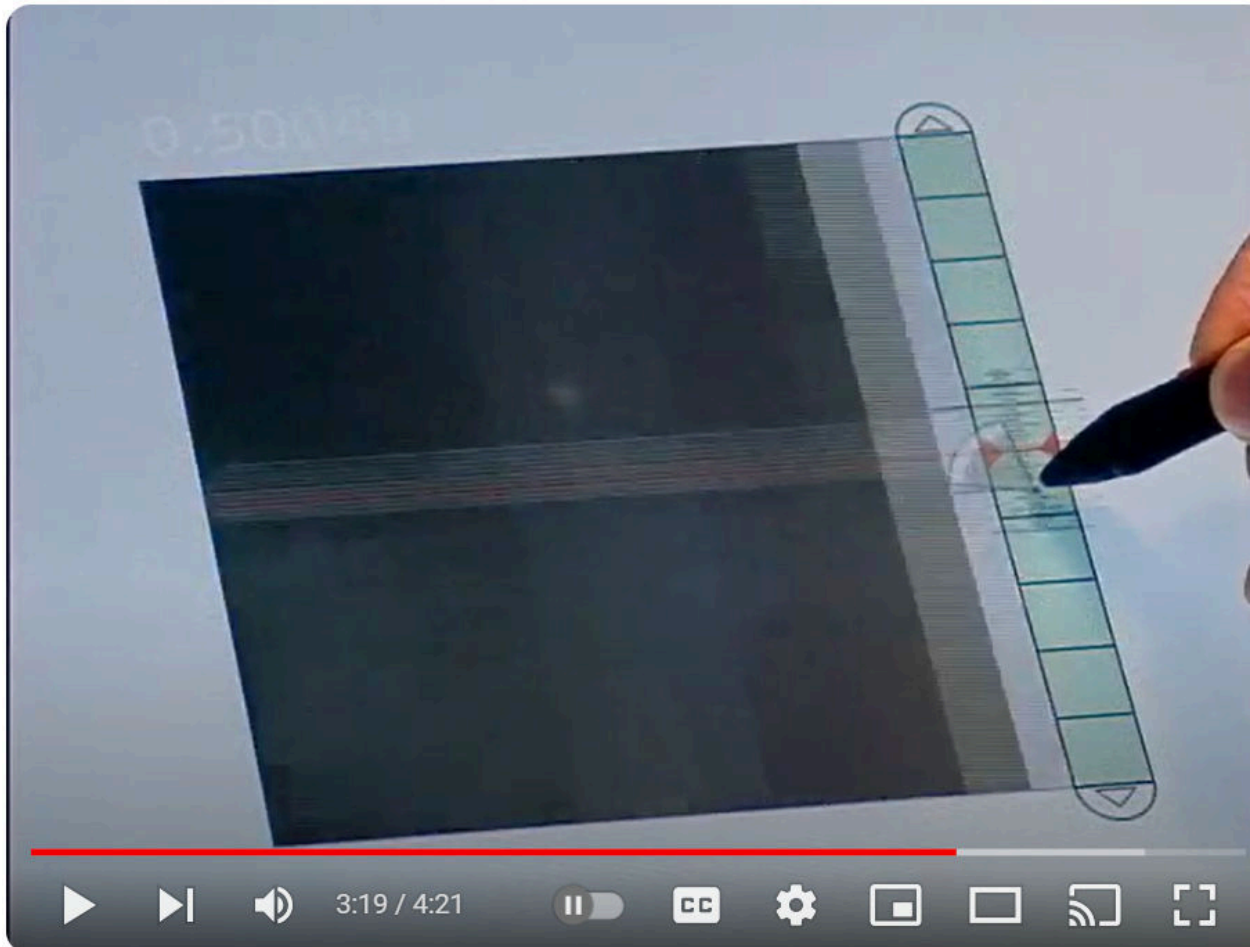
in appearance of the underlying image content and the Zlider itself, as shown in the Ramos Video below. APPLE-1004, 1, FIG. 1; APPLE-1005, 3:16-3:19 (illustrating the Zlider's zooming action and the change in appearance of the Vernier in response to the zooming and sliding action); APPLE-1003, ¶58.



APPLE-1004, FIG. 1



APPLE-1005, 3:16



APPLE-1005, 3:19

The combination of the Ramos Paper and the Ramos Video would beneficially inform provision of a widget that allows a user to adjust the level of zoom by modifying the pressure applied to a touch sensitive display, as the Ramos Paper teaches, while further displaying a change in appearance of markings, e.g., of a Vernier, in response to the zoom scale factor, as both Ramos Paper and Ramos Video teach, where at least a portion of the widget is at least semi-transparent to enable viewing of the underlying content, as Ramos Video shows. APPLE-1003,

¶59; APPLE-1004, 1, 3, FIG. 1; APPLE-1005, 0:16-0:21 (showing a change in the appearance of the Vernier markings), 3:16-3:19 (showing a change in the appearance of the Vernier markings, the zoom effect, and at least a portion Zlider widget as semi-transparent), 3:28 (showing at least a portion Zlider widget as semi-transparent). The resulting widget would offer several advantages. First, it would allow for “high precision manipulation” in “touch-sensitive platforms,” for applications not just limited to zooming and panning. APPLE-1004, 2-3; APPLE-1005, 0:07-0:12; APPLE-1003, ¶60. Second, the widget of the combined disclosures would offer a UI widget that is at least partially transparent such that content below is visible, resulting in a widget that is minimally intrusive and reduces the amount of the underlying content that is blocked or not visible. APPLE-1005, 3:16-3:19, 3:28; APPLE-1003, ¶60. Third, the widget would offer a “real-time visual indicator” of the pressure applied to the touchscreen (and thus the amount of zoom) and of the “current scale factor,” as shown by the changing “grid spacing” of the Vernier. APPLE-1004, 3; APPLE-1005, 0:16-0:21, 0:28-0:41, 3:16-3:19; APPLE-1003, ¶60.

Additionally, as the Ramos Paper and Ramos Video offer limited detail on how to implement a widget in a particular device (e.g., including hardware and software components), a POSITA would have naturally looked to prior art references, such as Ording, that also are directed to touch screen devices with user

interfaces for user interaction and that have applications that necessitate precise parameter manipulation, as Ording provides. APPLE-1003, ¶61. Ording describes a “portable device with a touch screen display [that] detects a contact area of a finger with the touch screen display.” APPLE-1006, Abstract. Ording further describes the hardware and software components included in such a devices (e.g., memory, processors, camera modules, peripherals interfaces). APPLE-1006, [0030], [0047]. Ording additionally teaches the use of semitransparent widgets (e.g., click wheel) for use as an input control device. APPLE-1006, [0045]. It further describes the use of various applications, including digital camera applications that benefit from precise parameter application, including for use with zoom. APPLE-1006, [0027], [0047]; APPLE-1003, ¶62.

The combined disclosures of the Ramos Paper, Ramos Video, and Ording would have amply motivated a POSITA to implementation of a widget in a “multifunctional device,” e.g., the device taught in Ording, which includes various software and hardware components and additionally provides semitransparent user input control devices, resulting in the Ramos Paper-Ramos Video-Ording device (“RROD”). APPLE-1003, ¶63. A POSITA would have found obvious that combining the teachings of the Ramos Paper, Ramos Video, and Ording would introduce multiple advantages. *Id.* First, Ording offers foundational hardware (including processor and memory) for implementing a widget, where such

components were well-known by the Critical Date and a POSITA would have understood those components were present in known devices configured to implement widgets, e.g., the Zlider. APPLE-1006, [0030], [0047]; APPLE-1003, ¶64. Second, Ording teaches the use of various applications configured to use a widget in the RROD, including “an e-mail application,” “a photo management application, a digital camera application, a digital video camera application, a web browsing application,” and “a digital video player application.” APPLE-1006, [0027]. A POSITA would have understood that any one of these applications would benefit from the resulting widget, and indeed, Ramos Paper and Ramos Video both at least contemplate the use of these types of applications. APPLE-1003, ¶65; APPLE-1004, 2-3 (“Graphic applications,” “Browsing on ZUIs,” “Integrated scale and parameter manipulation”); *see, generally* APPLE-1005 (showing the Zlider used with still images and moving images). Moreover, a POSITA would have recognized, for example, that an application such as a digital camera application would particularly benefit from the precise parameter manipulation that the widget offers when adjusting various parameters in addition to zoom (e.g., saturation, contrast, ISO, brightness, focal length, depth of field, etc.). APPLE-1003, ¶65. Third, Ording further explicitly teaches providing “user interfaces that are intuitive and transparent,” such as a “virtual click wheel” that can be a “semitransparent object.” APPLE-1006, [0028], [0045]; APPLE-1003,

¶66. A POSITA would have recognized the benefits of transparent or semitransparent UI objects that are minimally intrusive to the user. APPLE-1003, ¶66. Moreover, Ramos Paper, Ramos Video, and Ording are complementary references that describe similar—or in the case of the Ramos Paper and Video, the same—technology. *Id.* Given the similarities among the references and their complementary nature, a POSITA would have reasonably expected success in the combination. *Id.*

Implementing the Zlider described in the Ramos Paper and Ramos Video in a device, as taught by Ording, would have required only routine knowledge well within the skill of a POSITA prior to the Critical Date. APPLE-1003, ¶67. Notably, the Ramos Paper describes a widget that is compatible with input from a finger. APPLE-1004, 9 (“it is possible to estimate the contact area of a touching finger, thus estimating the applied pressure”). Moreover, Ording further discloses determining pressure from a finger making contact with a touch screen. APPLE-1006, [0146] (“when a finger is in physical contact with the touch screen display, the finger has to press the display with the pressure varying from one position to another position within the contact area”). Indeed, a POSITA would have amply understood that techniques for determining pressure applied by a finger input on a touch screen were well-known by the Critical Date. APPLE-1003, ¶67 (citing APPLE-1027, APPLE-1028, APPLE-1024). Moreover, the change would have

amounted to nothing more than the use of a known technique to improve similar devices – in each instance having a touch screen display – in a similar way, and combining prior art elements according to known methods to yield the predictable results described above. *KSR v. Teleflex*, 550 U.S. 398, 417 (2007); APPLE-1003, ¶67.

5. Claim 1

[1.pre]

To the extent the preamble is limiting, the RROD renders obvious [1.pre]. APPLE-1003, ¶68. The Ramos Paper teaches use of its methods and control using “capacitive touchpads.” APPLE-1004, 10. The Ramos Paper further explicitly discusses the use of PDAs and tabletPCs “with small screens and input space” in its discussion of “Motivation and Goals.” APPLE-1004, 2. Additionally, the Ramos Video shows the widget being used on a device having a touch screen. *See, generally*, APPLE-1005.

Such mobile devices (e.g., PDAs, tabletPCs, and devices with capacitive touchpads) were well known to include a camera by the Critical Date. APPLE-1003, ¶69. For implementation details of the Ramos Paper and Ramos Video’s methods in a portable device, as both contemplate, a POSITA would have naturally looked to similar such devices. *Id.* For instance, Ording teaches a “portable device with a touch screen display” that can further include “an imaging module

143 (also called a camera module)” and an “optical sensor 164” used with the imaging module to “capture still images or video.” APPLE-1006, Abstract, [0047], FIG. 2. A POSITA would have found it obvious to implement the a widget, such as the Zlider described in Ramos Paper and Ramos Video, in a “portable device with a touch screen display,” as taught by Ording, given the complementary functionality of the disclosure relating to the Ording device and the Zlider. APPLE-1003, ¶69.

[1.a]

The RROD renders obvious [1.a]. APPLE-1003, ¶70. In particular, Ording teaches that its device includes memory. APPLE-1006, [0030] (“The device 100 may include a memory 102 (which may include one or more computer readable storage mediums)...”), [0032]-[0033], FIG. 1B. Ording further states that “[m]emory 102 may include high-speed random access memory and may include non-volatile memory, such as one or more magnetic disk storage devices, flash memory devices, or other non-volatile solid-state memory devices.” APPLE-1006, [0032]. A POSITA would have understood that “non-volatile memory” is memory that retains storage even after power is removed, which is non-transitory memory. APPLE-1003, ¶70; APPLE-1011, 3 (“a storage medium or memory that retains data even when the power has been switched off”); APPLE-1012, 3 (“A form of computer memory that will store information for an indefinite period of time with

no power applied.”); APPLE-1013, 3 (“Computer memory which retains its content when the power is interrupted or turned off.”); APPLE-1014, 3 (“A type of memory whose contents are not lost when power to the memory is removed.”); APPLE-1015, 3 (“A type of memory whose contents are not lost when the power supply to the memory is switched off.”). Moreover, Figure 1B of Ording shows that memory 102 includes a number of components, such as “operating system 126,” “graphics module 132,” and various applications 136 (e.g., contacts, telephone, video conference, e-mail, instant messaging, blogging, camera, image management, video and music player, notes, map, browsing). APPLE-1006, FIG. 1B. A POSITA would have thus further understood that the memory 102 would be non-transitory memory that retains storage of these components of the device even after power is removed. APPLE-1003, ¶70.

[1.b]

The RROD renders obvious [1.b]. APPLE-1003, ¶71. In particular, Ording teaches that its device includes a touch screen. APPLE-1006, [0026], [0030] (“portable multifunction devices 100 with touch-sensitive displays 112 ... sometimes called a “touch screen”), [0037], [0038] (“The touch-sensitive touch screen 112 provides an input interface and an output interface between the device and a user.”), [0039], FIG. 1B.

[1.c]

The RROD renders obvious [1.c]. APPLE-1003, ¶72; §IV.A.4. In particular, Ording teaches that its device includes a camera. APPLE-1006, [0027], [0047] (“In conjunction with an imaging module 143 (also called a camera module), the optical sensor 164 may capture still images or video.”), FIG. 1B.

[1.d]

The RROD renders obvious [1.d]. APPLE-1003, ¶73. In particular, Ording teaches that its device includes “one or more processors 120” that “run or execute various software programs and/or sets of instructions stored in memory 102 to perform various functions for the device 100 and to process data” in addition to controllers (controller 122, display controller 156, and other input controller(s) 160) that further execute instructions stored in memory. APPLE-1006, [0033], [0039] (“touch screen 112 and the display controller 156 (along with any associated modules and/or sets of instructions in memory 102) detect contact (and any movement or breaking of the contact) on the touch screen”), [0045] (“User commands and navigation commands provided by the user via the click wheel may be processed by an input controller 160 as well as one or more of the modules and/or sets of instructions in memory 102.”), FIG. 1B. Figure 1B further shows that the processors 120 (cyan) are in communication with the memory 102 (green), the touch screen 112 (red), and the camera 143/164 (yellow). APPLE-1006, FIG.

1B.

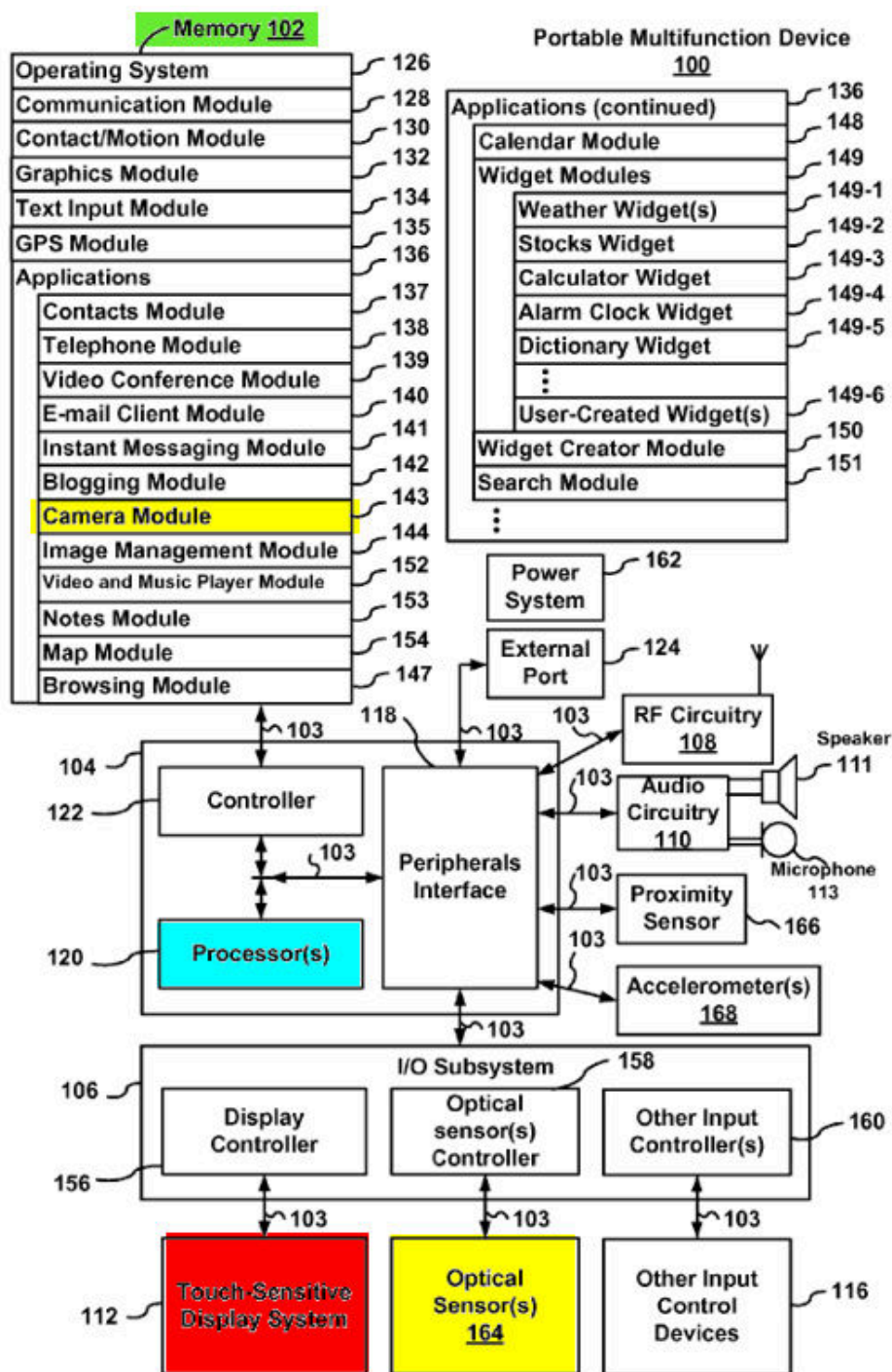
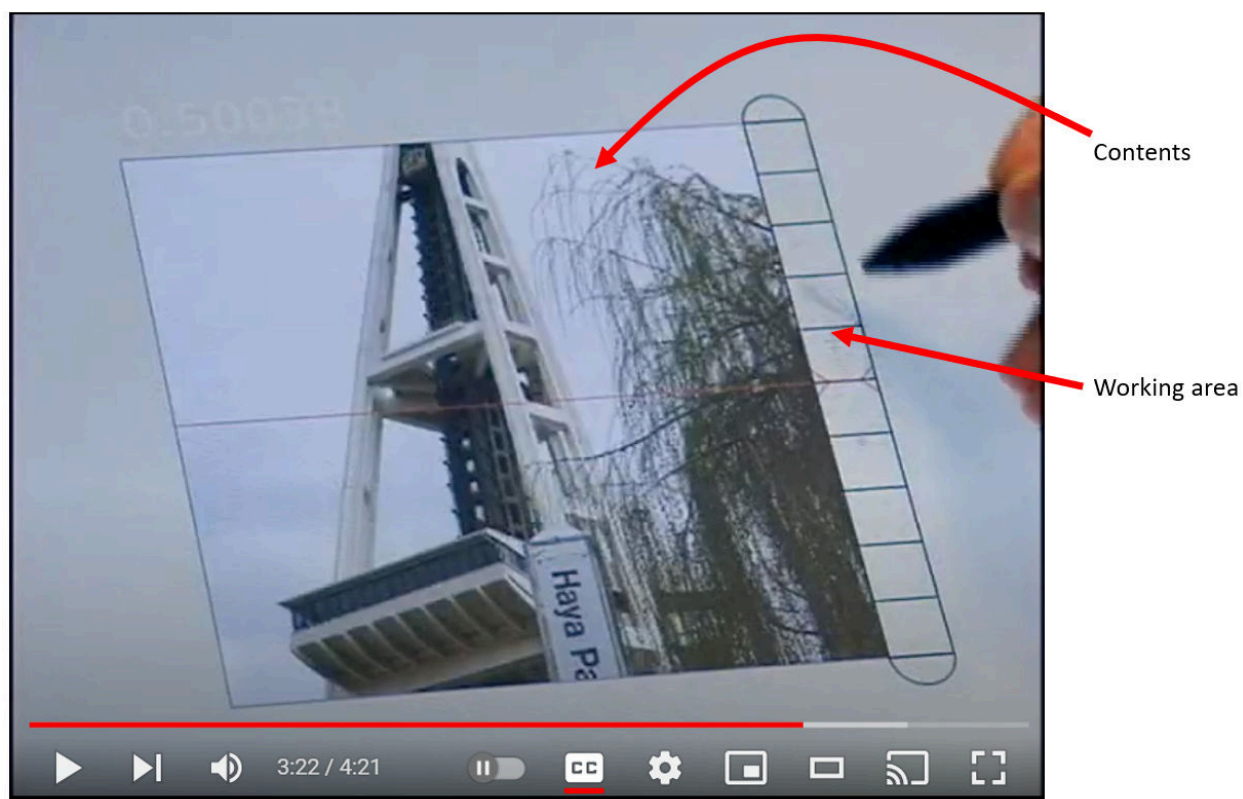


Figure 1B

APPLE-1006, FIG. 1B (highlighted)

[1.e]

The RROD renders obvious [1.e]. APPLE-1003, ¶74. The Ramos Video shows several examples of contents displayed on a first virtual display layer (e.g., behind a working area) of a touch screen. APPLE-1003, ¶74.



APPLE-1005, 3:22 (annotated)



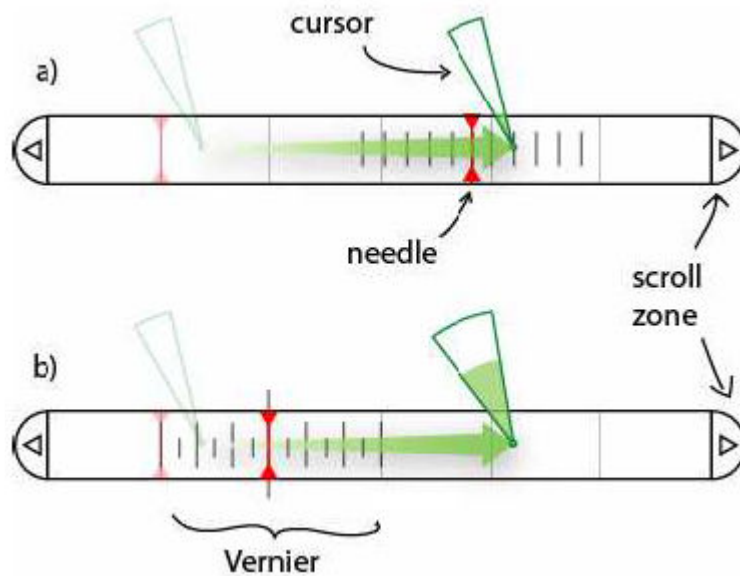
APPLE-1005, 0:03 (annotated)

Ording similarly teaches that its touch screen device displays contents. For example, Ording teaches that its “touch screen display may be used as a viewfinder for either still and/or video image acquisition” such that the touch screen displays “contents.” APPLE-1006, [0047]. In another example, Ording explains that “information is displayed on the touch screen display in a portrait view or a landscape view,” illustrating again contents displayed on the touch screen. APPLE-1006, [0049]. A POSITA would have understood that the displayed contents in each of these examples are displayed on a first virtual layer because they all appear on the same single virtual surface. APPLE-1003, ¶75. In the

combination, the RROD includes a touch screen, such as Ording's touch screen, that displays various types of contents (e.g., information and images, as taught by Ramos Video and Ording) on a first virtual display layer behind the widget's working area. *Id.*

[1.f]

The RROD renders obvious [1.f]. APPLE-1003, ¶76. The Ramos Paper explains that its “Zlider widget (Figure 1) consists of a rectangular working area that the user can scrub in order to adjust a parameter,” where “the user taps and drags its pointer across the working area until the desired value is reached or effect is achieved.” APPLE-1004, 3. Figure 1 (below) shows the “working area” in two examples (a) and (b) where a “pressure cursor” provides “users with a real-time indicator of the pressure they are applying with the input transducer.” APPLE-1004, 1, 3, FIG. 1. “The pressure cursor has a wedge-like shape that changes its aperture with the amount of pressure applied,” and the “wedge’s area fills as the pressure increases, until completely filled when the pressure reaches the maximum level the device can sense.” APPLE-1004, 3, FIG. 2.



APPLE-1004, 1 (FIG. 1)

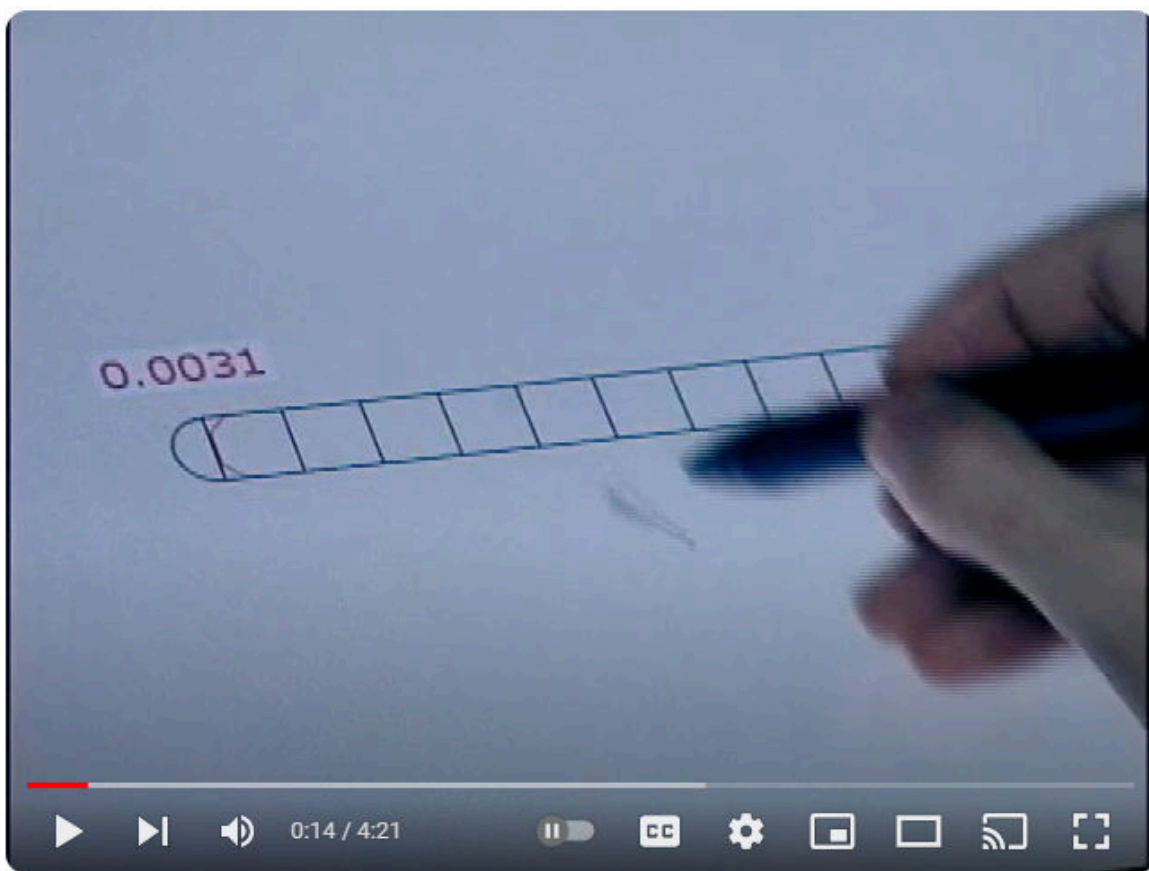
The Ramos Video further discloses displaying at least one user interface element (working area) on the touch screen, as shown above in [1.e]. *See, e.g.*, APPLE-1005, 0:03, 3:22; APPLE-1003, ¶77. Moreover, Ording teaches “the device has a touch-sensitive display” where “the user interacts with the GUI primarily through finger contacts and gestures on the touch-sensitive display.” APPLE-1006, [0008]. For instance, Ording discloses a “virtual click wheel as an input control device,” that a user can use to “navigate among and interact with one or more graphical objects ... displayed in the touch screen 112 by rotating the click wheel or by moving a point of contact with the click wheel.” APPLE-1006, [0045].

In the combination, the RROD’s touch screen (per Ording) displays one or

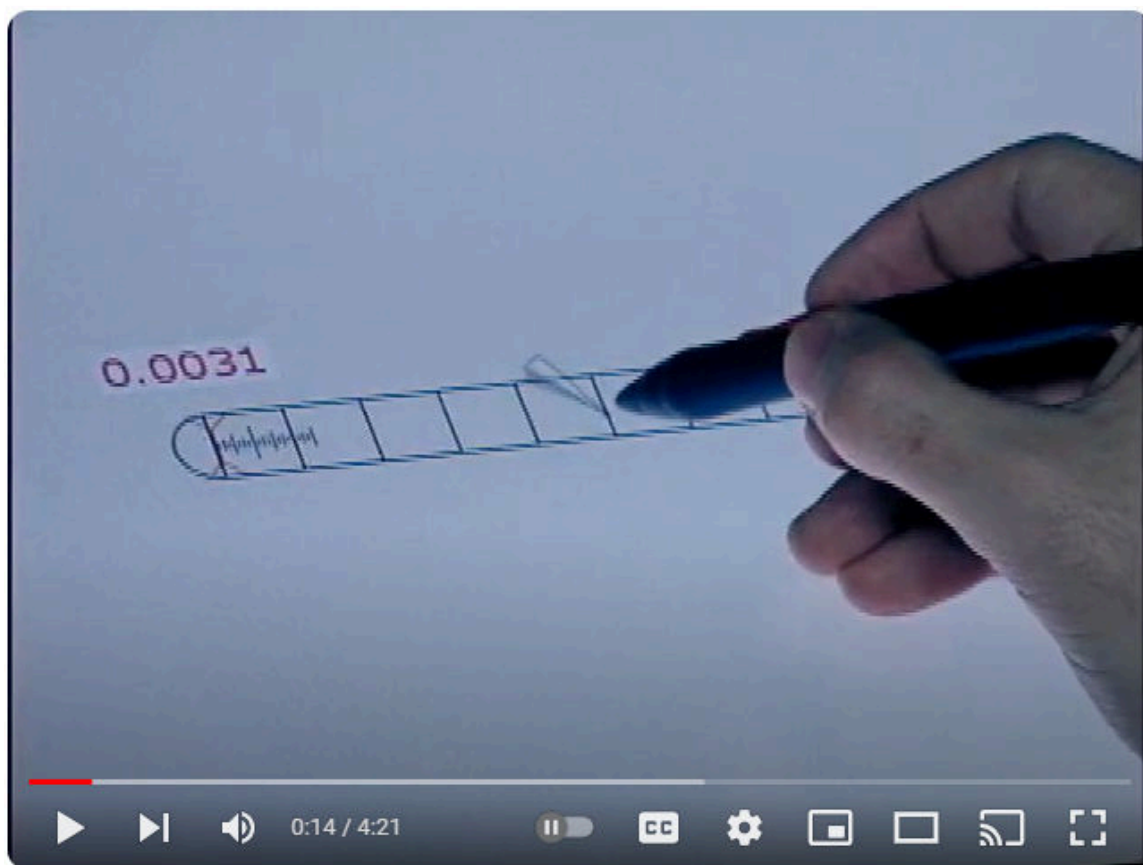
more GUIs (user interface element) that the user can interact with, per Ording, including the widget (or simply the working area of the widget), per Ramos Paper and Ramos Video. APPLE-1003, ¶78. In particular, as discussed above, a POSITA would have found it obvious to implement the widget, as described in Ramos Paper and Ramos Video, in a device, such as the device described in Ording, such that the widget is provided as a user interface element for precise parameter manipulation. *Id.*; §IV.A.4.

[1.g]

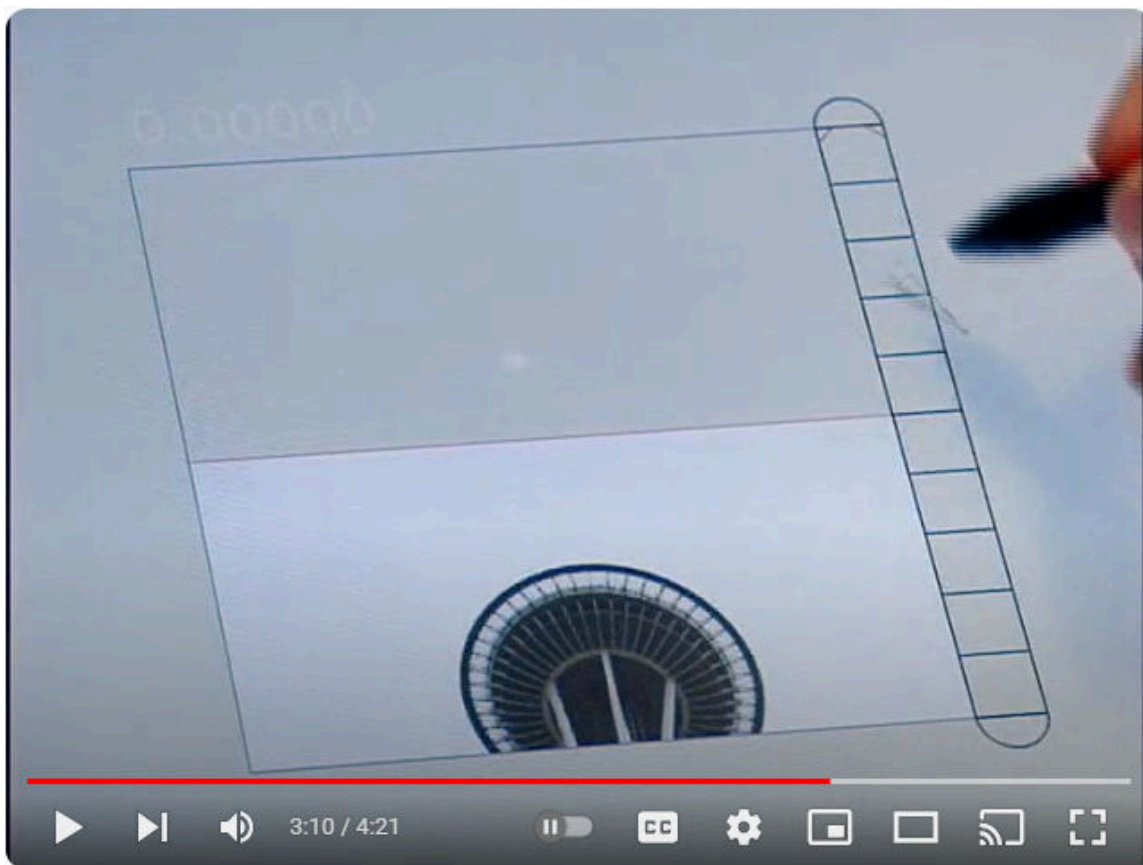
The RROD renders obvious [1.g]. APPLE-1003, ¶79. The Ramos Paper explains that, “[t]o operate the Zlider the user taps and drags its pointer across the working area until the desired value is reached or effect is achieved.” APPLE-1004, 3. The Ramos Video further shows several examples of the device detecting at least a portion of a touch on the working area (at least one user interface element) displayed on the touch screen, as evidenced by the “before” and “after” of the displays, shown below. *See, generally*, APPLE-1005.



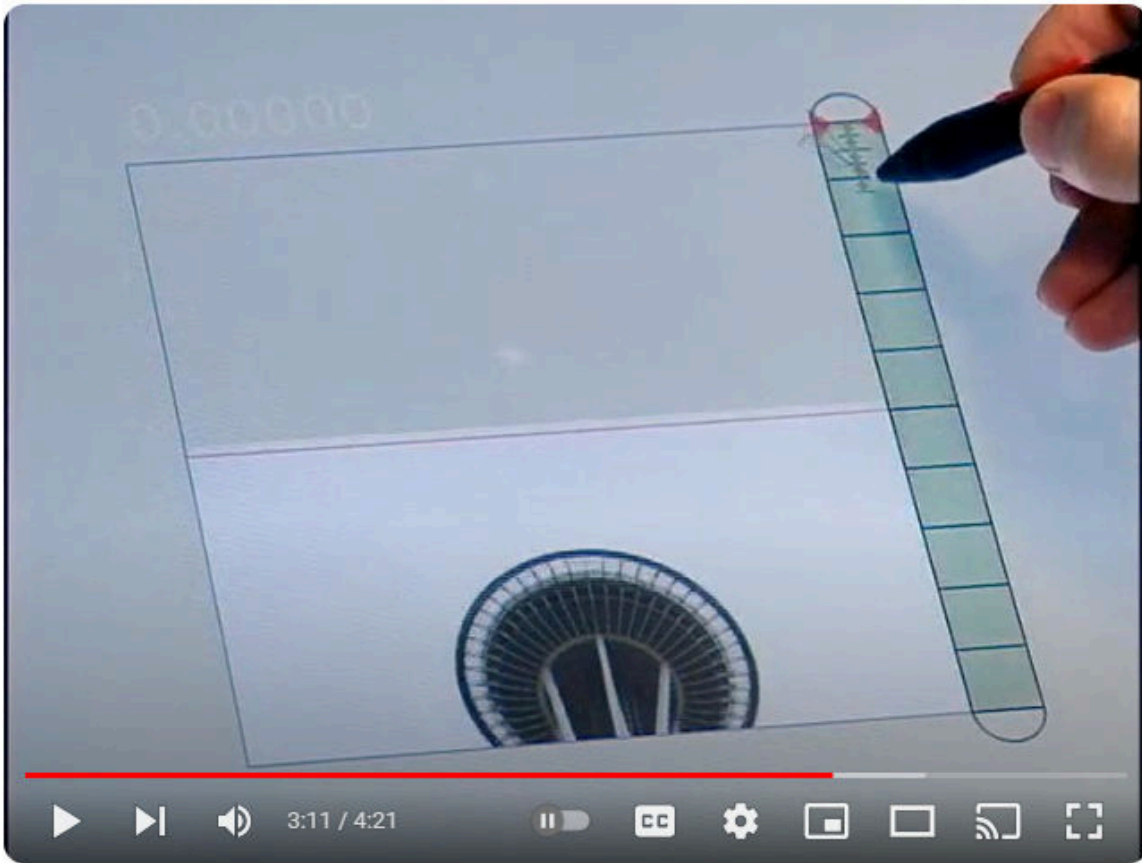
APPLE-1005, 0:14 (displaying the touch screen before a touch is detected on the working area)



APPLE-1005, 0:14 (displaying the touch screen after a touch is detected, as evidenced by the appearance of the Vernier on the working area)



APPLE-1005, 3:10 (displaying the touch screen before a touch is detected on the working area)



APPLE-1005, 3:11 (displaying the touch screen after a touch is detected on the working area, as evidenced by the appearance of the Vernier on the working area)

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. APPLE-1003, ¶80. Indeed, the '580 Patent explains that “contact pressure level may be represented by a touch state,” which “refers to a predefined subset of the range of measurable contact pressures,” where the “lowest touch state may require some form of proximity.” APPLE-1001, 17:22-36; *see also* APPLE-1006, [0141] (“A finger contact with the touch screen display (e.g., a finger tap) is a process involving multiple actions

including the finger approaching the display...”); APPLE-1017, FIG. 59E. Thus, The RROD teaches and/or renders obvious detecting at least a portion of a touch (e.g., proximity). APPLE-1003, ¶80.

Moreover, Ording teaches that a user can use its virtual click wheel to “navigate among and interact with one or more graphical objects ... displayed in the touch screen 112 by rotating the click wheel or by moving a point of contact with the click wheel.” APPLE-1006, [0045]. In Ording’s example, the touch input on the touch screen comprises at least a portion of a touch. APPLE-1003, ¶81. In particular, Ording further explains various contact a user may make on the device, including, for example, “a gesture, such as one or more taps, one or more swipes (from left to right, right to left, upward and/or downward) and/or a rolling of a finger (from right to left, left to right, upward and/or downward) that has made contact with the device 100.” APPLE-1006, [0096].

In the combination, the RROD detects, on the touch screen, at least a portion of a touch on the touch screen, as taught or suggested by Ramos Paper, Ramos Video, and/or Ording, on a GUIs (e.g., the working area of the Zlider, as taught by Ramos Paper and Ramos Video). APPLE-1003, ¶82. The contact may be made “using any suitable object or appendage, such as a stylus, a finger, and so forth.” APPLE-1006, [0043].

[1.h]

The RROD renders obvious [1.h]. APPLE-1003, ¶83. As discussed above for [1.g], at least a portion of a touch includes contact on the touch screen (e.g., with a stylus or a finger), as Ording teaches, and meeting a threshold (e.g., a threshold proximity (hover threshold) between the stylus and the touch screen), as Ramos Paper and Ramos Video teach and/or suggest. *Id.* Ording further suggests an aspect of a touch surpassing a threshold. *Id.* In particular, Ording explains that “inadvertent contact with a graphic may not select the graphic. For example, a swipe gesture that sweeps over an application icon may not select the corresponding application when the gesture corresponding to selection is a tap.” APPLE-1006, [0096].

A POSITA would have recognized or at least found obvious, based on Ording, that a gesture includes at least a duration and a length that are used to recognize the type of gesture (e.g., a tap or a swipe). APPLE-1003, ¶84. Indeed, use of such thresholds was well-known by the Critical Date and would have at least been obvious to include in Ording to distinguish between an intentional touch and an unintentional touch, or various types of intentional gestures. *Id.*; see APPLE-1006, [0141]; APPLE-1020, [0031], [0033] (“ignore or reject any touches that have a duration that is less than a predetermined minimum amount of time, to ignore or reject touches that do not traverse a predetermined minimum portion of

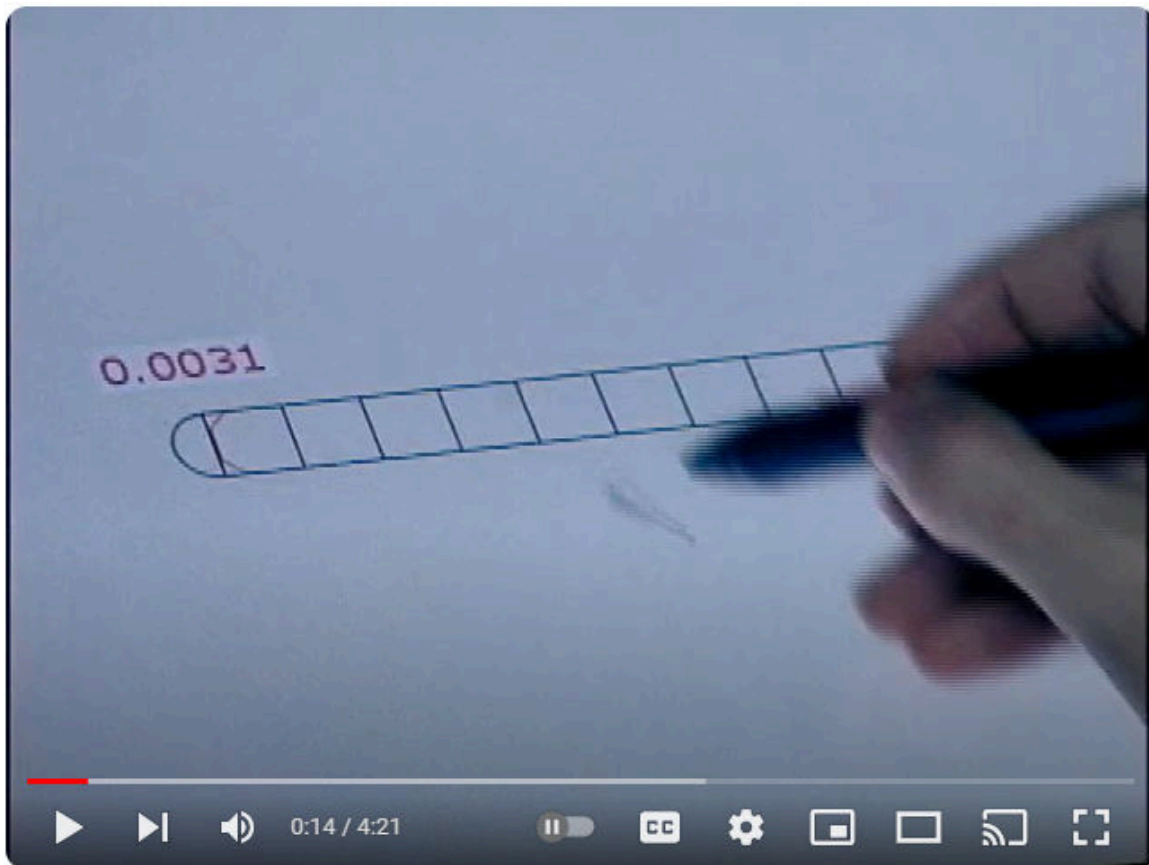
the touch element”); APPLE-1023, [0019], [0060]-[0062]; *see also* APPLE-1003, ¶84 (citing APPLE-1023). That is, when an aspect of the touch (e.g., its duration or its length) is detected to surpass a threshold (e.g., a threshold time or threshold distance), the touch is determined to be a particular gesture that invokes a particular function. APPLE-1003, ¶85; *see, e.g.*, APPLE-1006, [0136] (“activating the desired application (e.g., by a tap or other finger gesture on the icon corresponding to the application)”). As discussed above for [1.g], Ramos Paper and Ramos Video similarly teach or suggest the use of a threshold associated with a detected aspect of a touch: when an aspect of the touch is detected to surpass a threshold (i.e., the signals associated with the hover threshold described further below) when using the Zlider, the Vernier is displayed on the touchscreen. APPLE-1003, ¶85; *see, e.g.*, APPLE-1005, 0:14, 3:10-3:11.

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 widget, as taught by Ramos Paper and Ramos Video, is displayed on the touch screen. APPLE-1003, ¶86. As shown in both the Ramos Paper and Ramos Video, the Vernier comprises a plurality of markings. APPLE-1004, 3 (“The Zlider also displays a Vernier ... the Vernier in our Zlider adapts its grid spacing depending on the widget’s current scale factor.”), FIG. 1; *see, generally*,

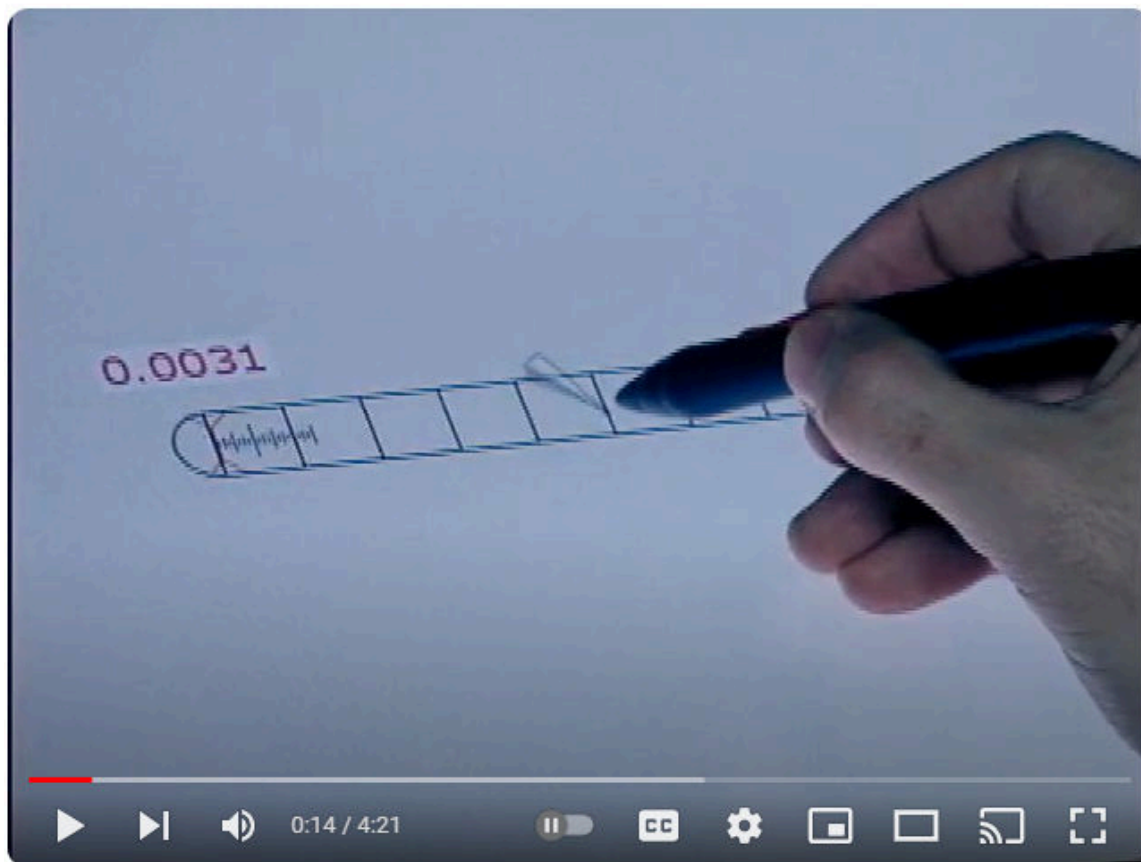
APPLE-1005.

In the combination, the plurality of markings are displayed on a second virtual layer that appears to have a lesser depth than the first virtual layer in response to the touch, as taught by Ramos Paper and Ramos Video, and at least a portion of the second virtual layer is at least partially translucent, as taught or suggested by Ramos Paper, Ramos Video, and Ording. APPLE-1003, ¶87.

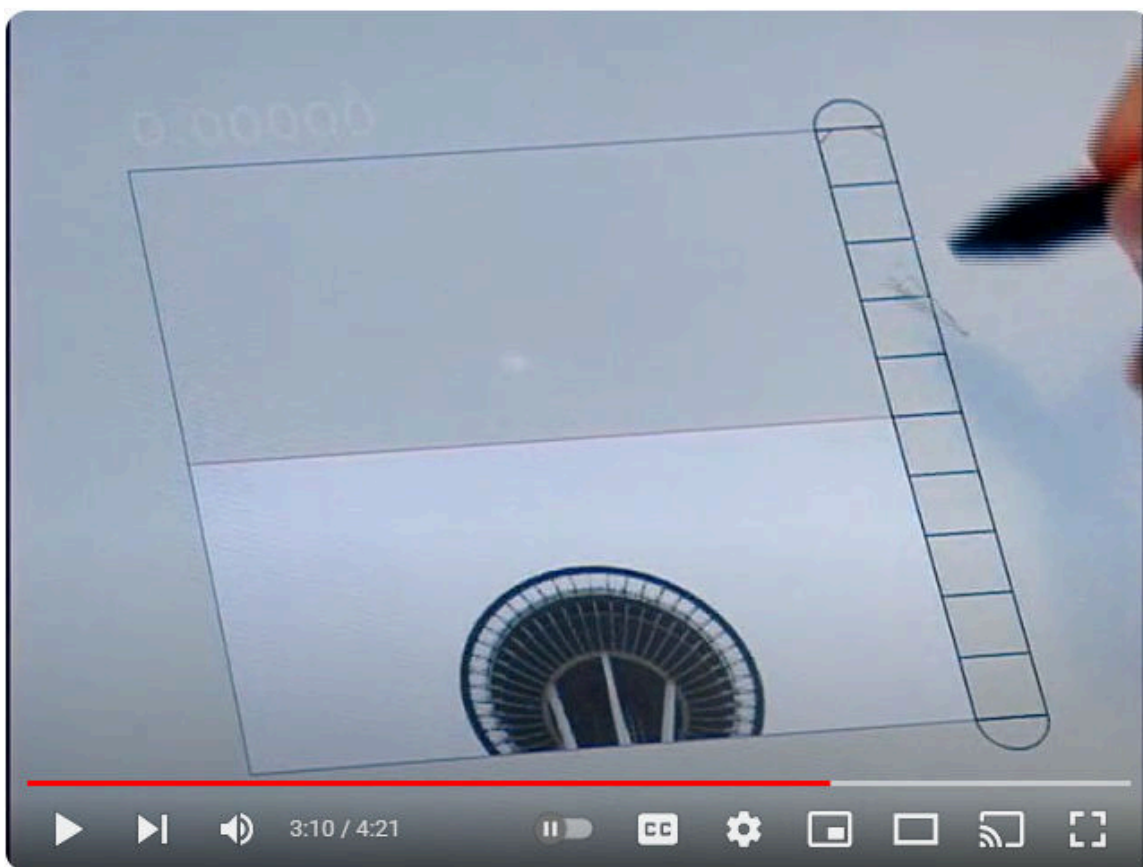
First, the Ramos Video shows how a plurality of markings appear in the working area in response to the touch on the touch screen. *See, e.g.*, APPLE-1005, 0:14, 3:10-3:11; APPLE-1003, ¶88.



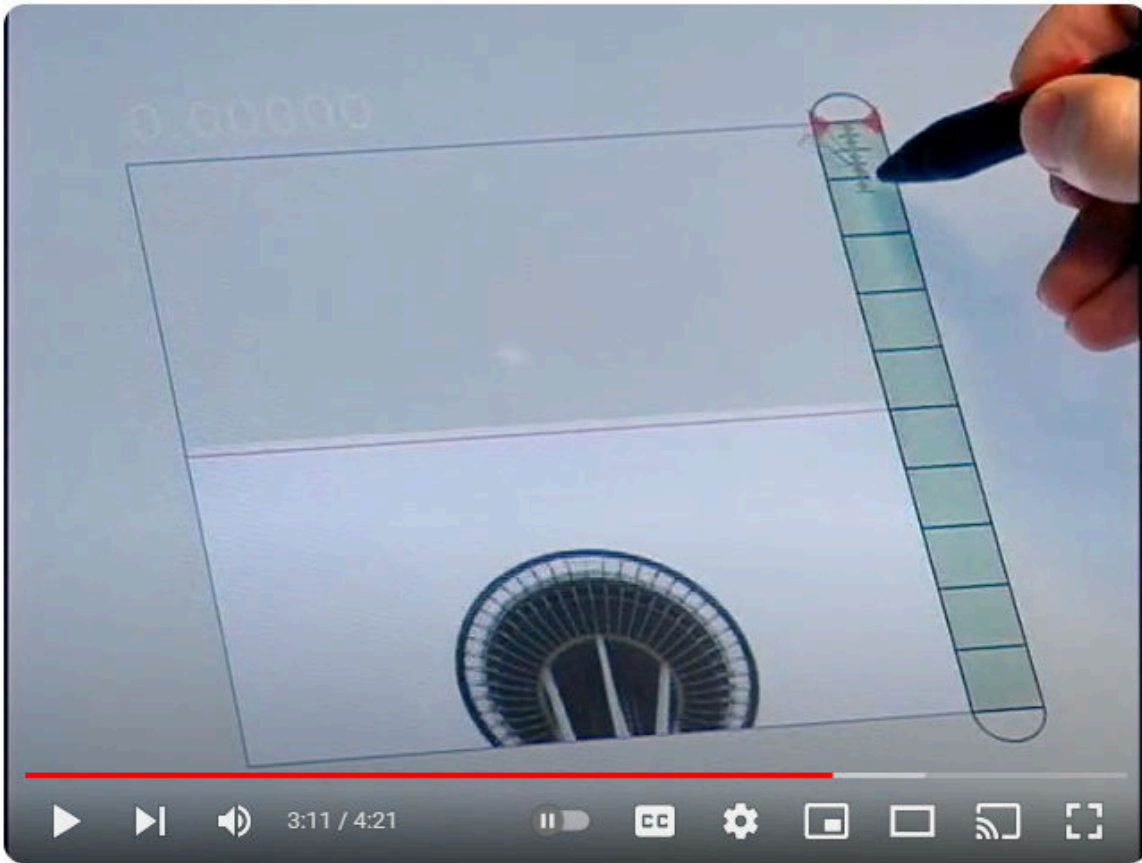
APPLE-1005, 0:14 (displaying the touch screen before a touch is detected on the working area)



APPLE-1005, 0:14 (displaying the touch screen after a touch is detected (i.e., surpassing the hover threshold), as evidenced by the appearance of the Vernier on the working area)

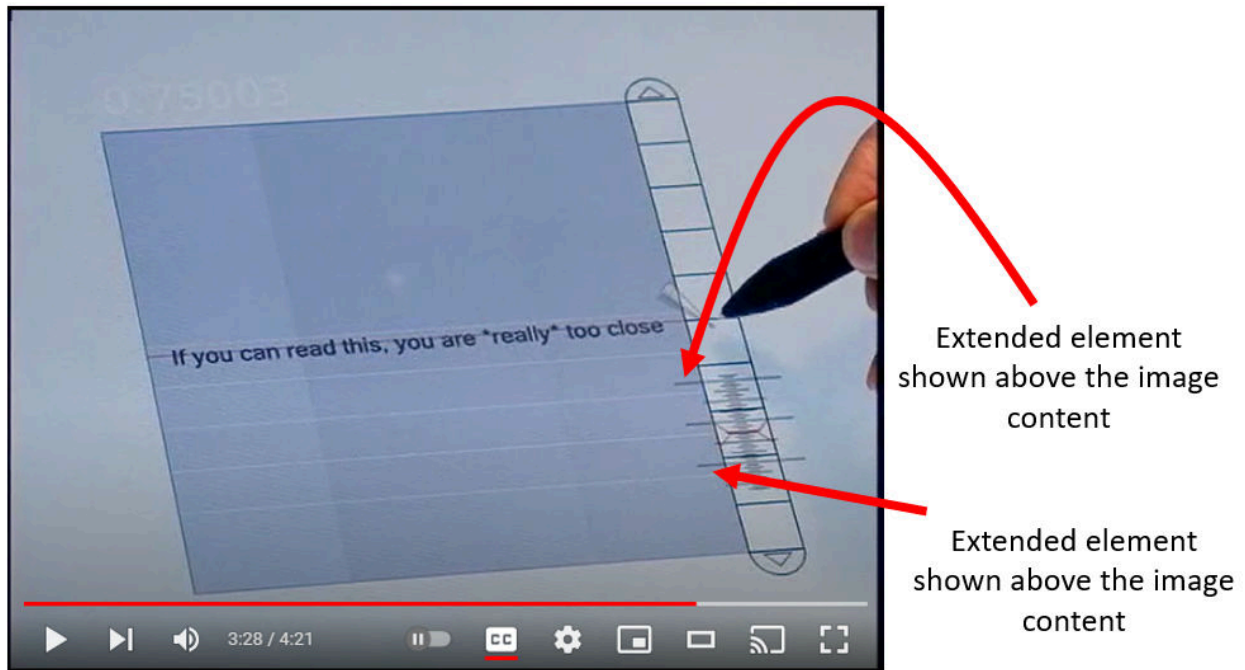


APPLE-1005, 3:10 (displaying the touch screen before a touch on the working area is detected)



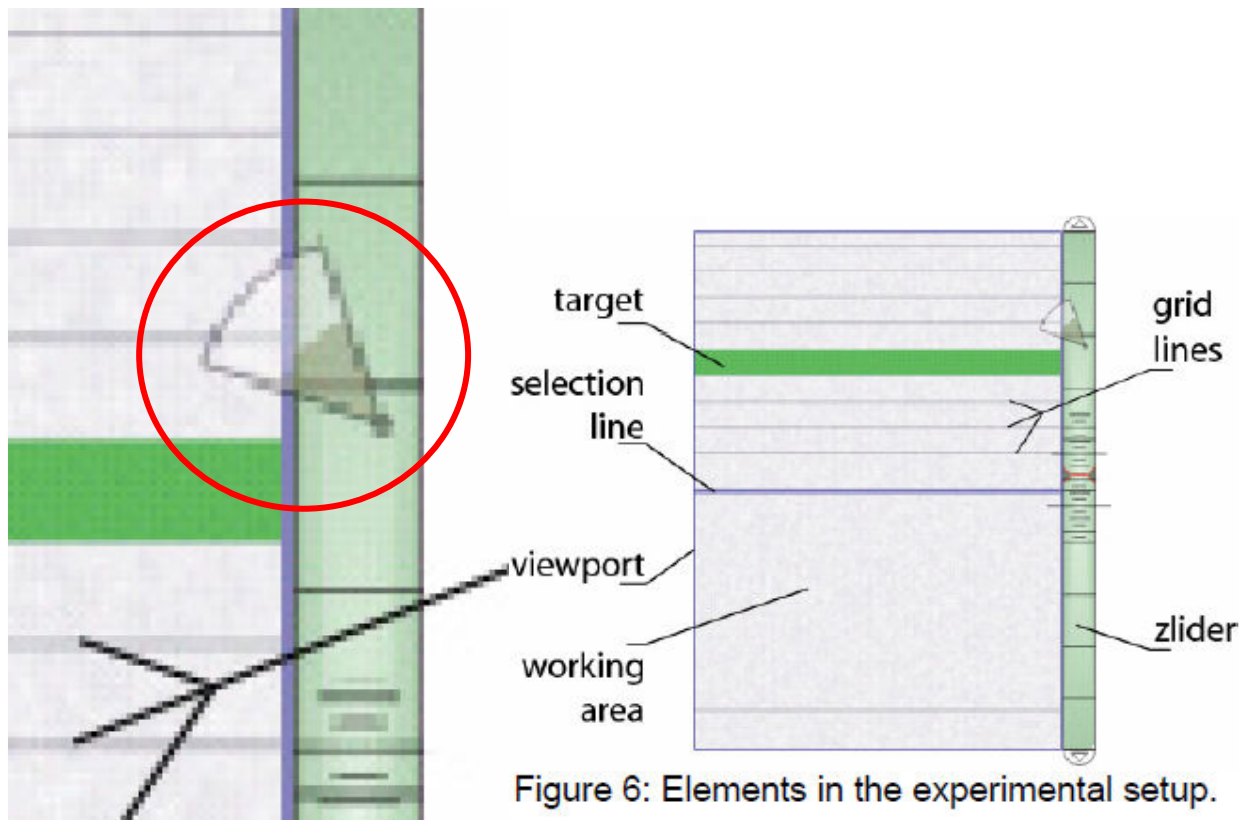
APPLE-1005, 3:11 (displaying the touch screen after a touch on the working area is detected (i.e., surpassing the hover threshold), as evidenced by the appearance of the Vernier on the working area)

The Ramos Video further shows that the Vernier is displayed *over* the image, so a POSITA would have understood the Vernier is in a second virtual display layer that appears to have lesser depth than the first virtual display layer in which the image content is located. APPLE-1003, ¶89; APPLE-1005, 0:14, 3:10-3:11. This is further evidenced, for example, by the appearance of extended elements of the Vernier that appear when the scale is greater than one, as shown below. APPLE-1005, 3:28.



APPLE-1005, 3:28 (annotated)

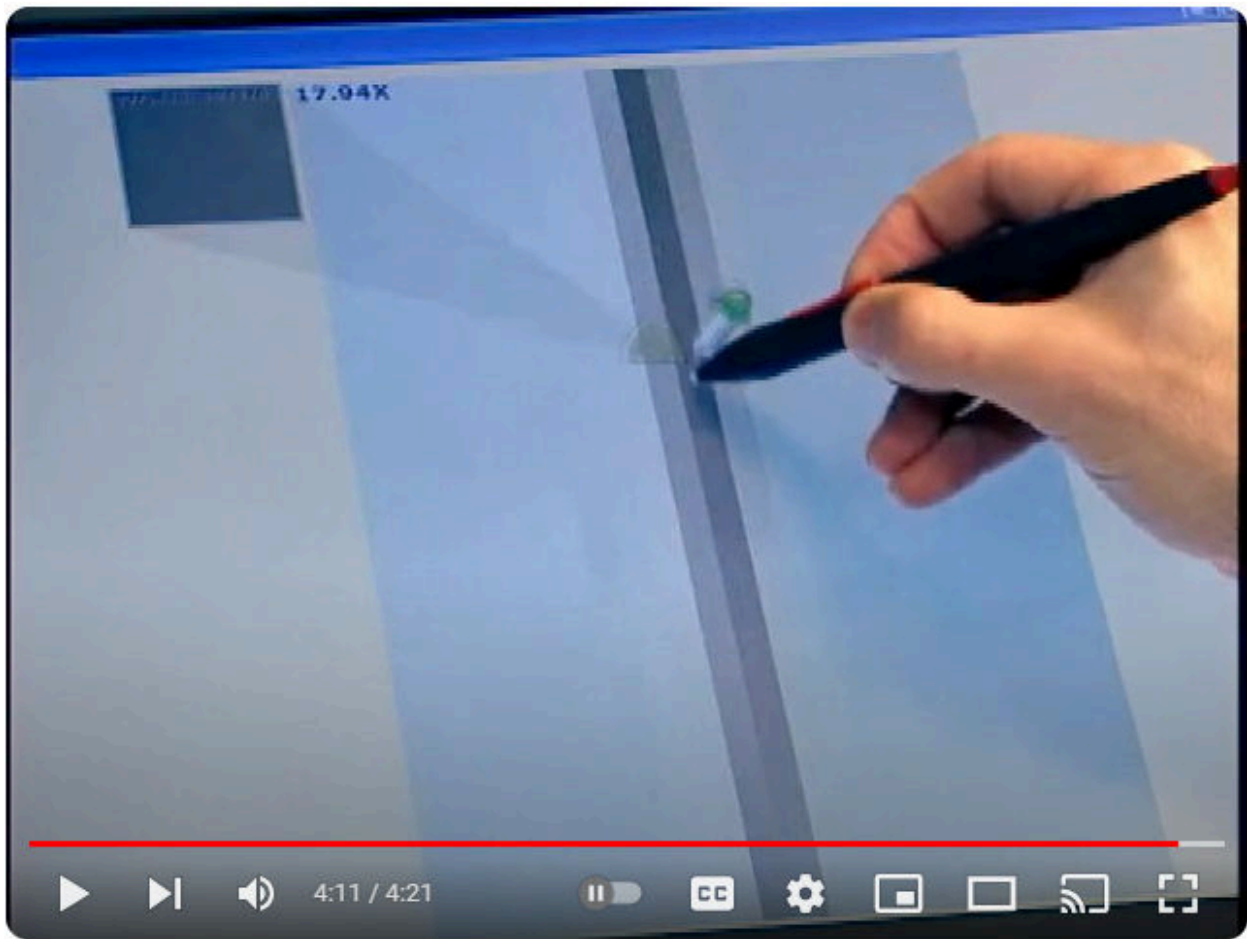
The Ramos Paper teaches or suggests that the Zlider is at least partially translucent, showing an example Zlider in Figure 6 (below) where its “pressure cursor” (circled below in red) is semi-transparent, as evidenced by the grid lines visible through the cursor. APPLE-1004, 6, FIG. 6; APPLE-1003, ¶90.



APPLE-1004, 127 (Figure 5-16) (annotated, zoomed in on left)

As shown in Figure 6, the “pressure cursor” of the Zlider is displayed in a second layer (i.e., it is always above, for example, the image being displayed and manipulated by the Zlider) along with the other components of the Zlider (e.g., working area and Vernier). APPLE-1004, FIG. 6; APPLE-1003, ¶91.

Additionally, the Ramos Video at 3:57-4:15 also shows an alternative Zlider in which translucent markings (a wedge connecting the cursor location with a box top-left) appear on a second layer in response to an aspect of touch. APPLE-1005, 3:57-4:15.

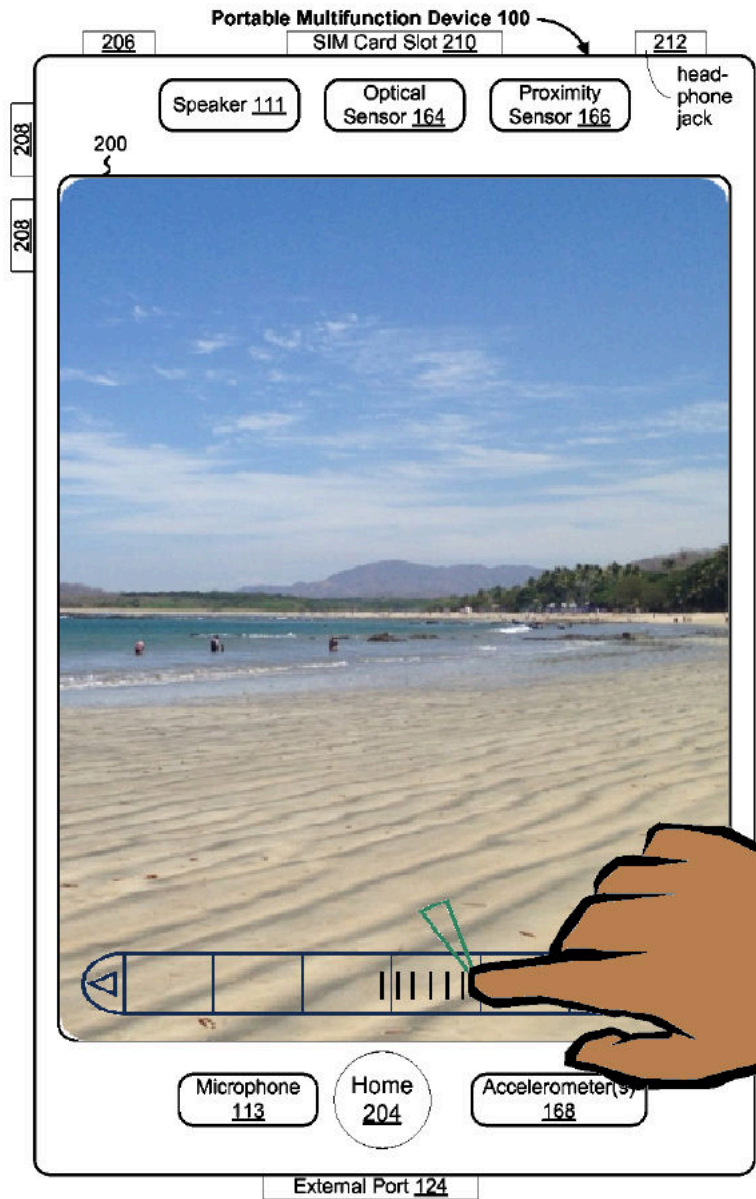


APPLE-1005, 4:11

From the Ramos Paper and Ramos Video, a POSITA would have understood that there are two options: either the Zlider is shown to the side of the underlying image, or the Zlider is shown on top of the underlying image (i.e., on a second layer). APPLE-1003, ¶92. As such, a POSITA would have found it obvious to try this finite number of identified, predictable solutions, with a reasonable expectation of success. *Id.*

Moreover, Ording discloses presentation of a “semitransparent object.”

APPLE-1006, [0045] (“User commands and navigation commands provided by the user via the click wheel may be processed by an input controller 160 as well as one or more of the modules and/or sets of instructions in memory 102.”), [0094] (“This device moves a gridded palette of tools, commonly presented as a transparent overlap, on the user’s desktop.”). Thus, a POSITA would have found it obvious to implement a widget, per the Ramos Paper and Ramos Video, using the well-known approach to provide UI objects as “semitransparent,” per *Ording*. APPLE-1003, ¶93. Indeed, such an implementation of the widget would have the benefit of providing a less intrusive UI element that permits a user to use the widget while minimizing the obstruction on the image content caused by the UI element. *Id.* An example of the RROD with the semitransparent widget is shown below. *Id.*

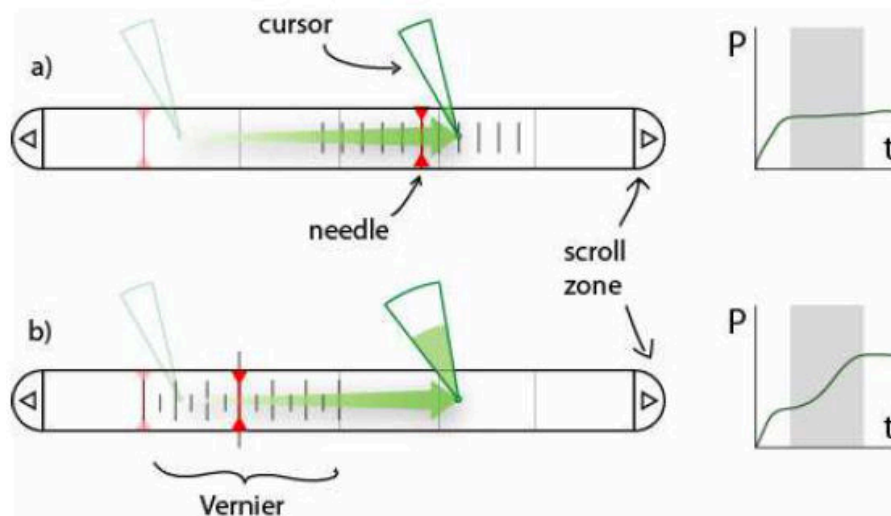


APPLE-1006, FIG. 2 (modified) with Ramos Zlider; APPLE-1003, ¶93

[1.i]

The RROD renders obvious [1.i]. APPLE-1003, ¶94. The Ramos Paper shows an example of a touch movement that occurs on the markings, as indicated by the cursor on the markings and the green arrow that represents a sliding motion.

APPLE-1004, 1, FIG. 1; *see also id.*, 3 (“The Zlider widget (Figure 1) consists of a rectangular working area that the user can scrub in order to adjust a parameter $v \in [low, high]$, where *low* and *high* are arbitrary limit values. There is no particular handle the user needs to grab to use the zlider widget. To operate the Zlider the user taps and drags its pointer across the working area until the desired value is reached or effect is achieved.”).



APPLE-1004, 1 (Figure 1)

The Ramos Video also shows examples of a touch movement occurring on the plurality of markings. In the combination, the RROD detects, for example, a

touch movement in the form of a user touching the Vernier (markings) displayed on the touch screen and sliding and/or changing the amount of pressure applied on the screen, as Ramos Paper and Ramos Video teach. APPLE-1003, ¶95. Indeed, the mobile device can receive and process either a sliding or a changing pressure touch movement on its touch screen, per Ording, so the combination could be implemented with the widget, requiring only routine programming knowledge well within the skill of a POSITA prior to the Critical Date. APPLE-1003, ¶95; APPLE-1006, [0146] (“finger has to press the display with the pressure varying...”), FIG. 3 (“slide to unlock”).



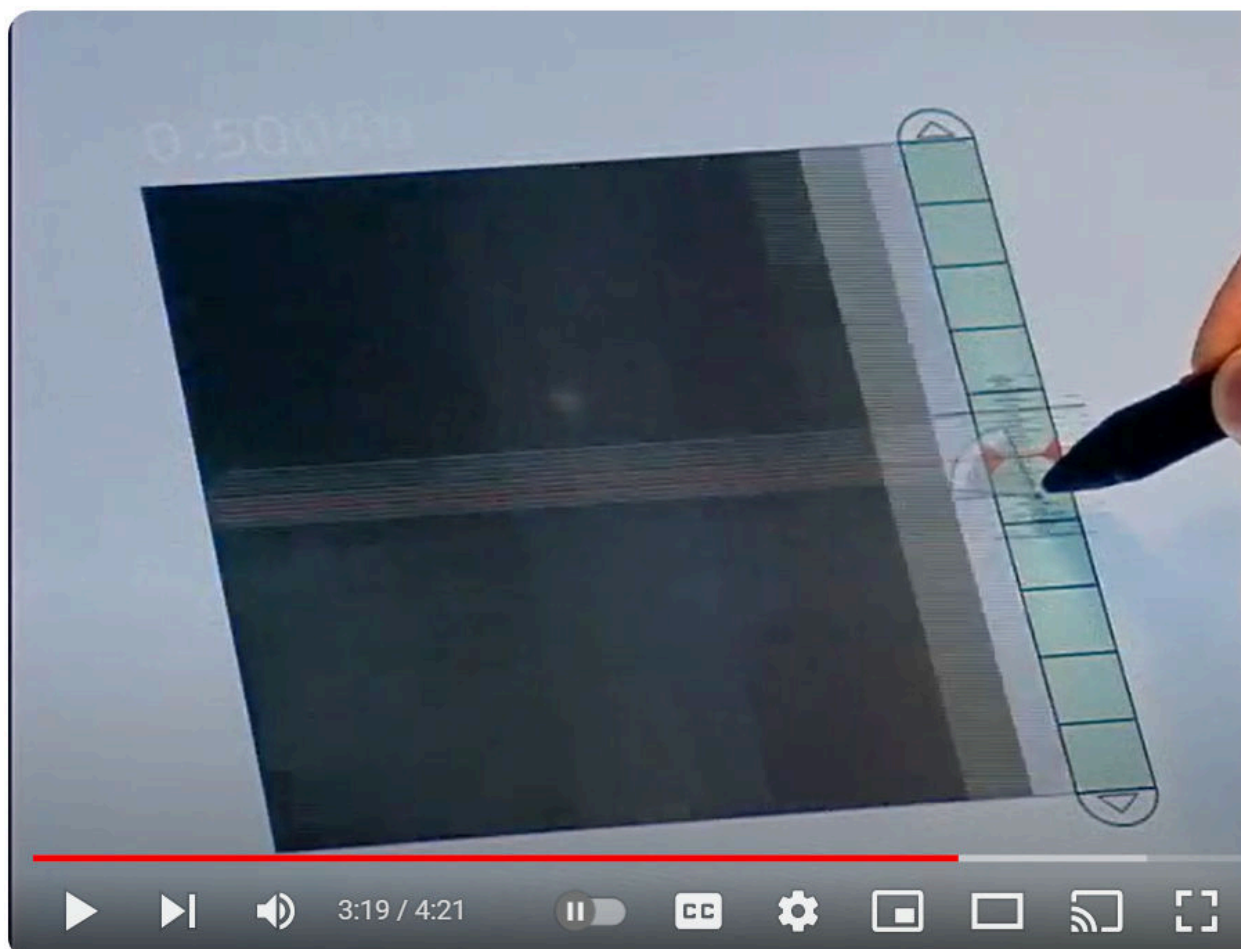
APPLE-1005, 3:16

[1.j]

The RROD renders obvious [1.j]. APPLE-1003, ¶96. The Ramos Video shows that touching the markings and pressing on the touch screen with different pressure causes the markings to move, relative to one another. APPLE-1005, 3:07-3:32; *see also id.*, 0:14-0:27. This is further illustrated below in the Ramos Video at 3:16 and 3:19.

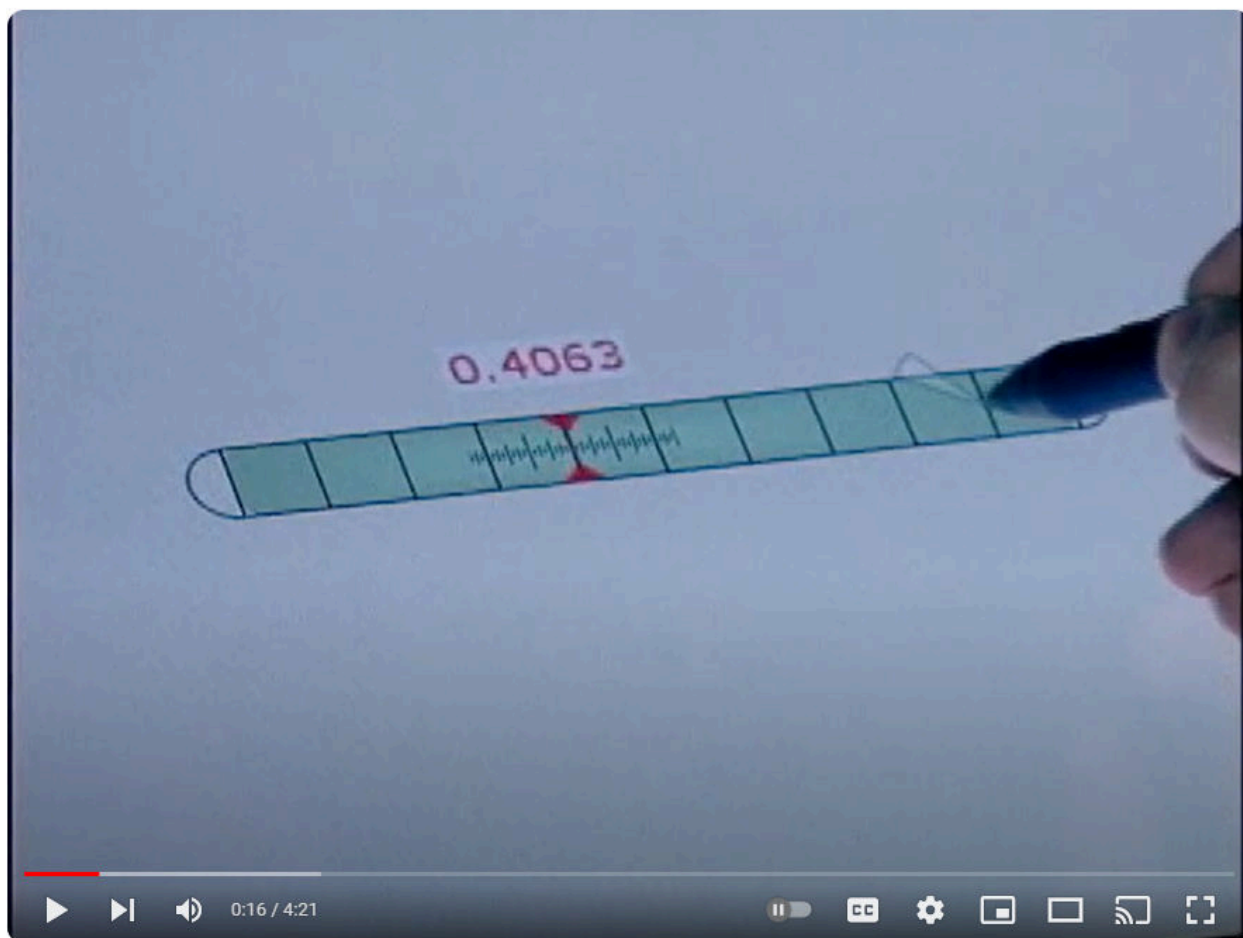


APPLE-1005, 3:16

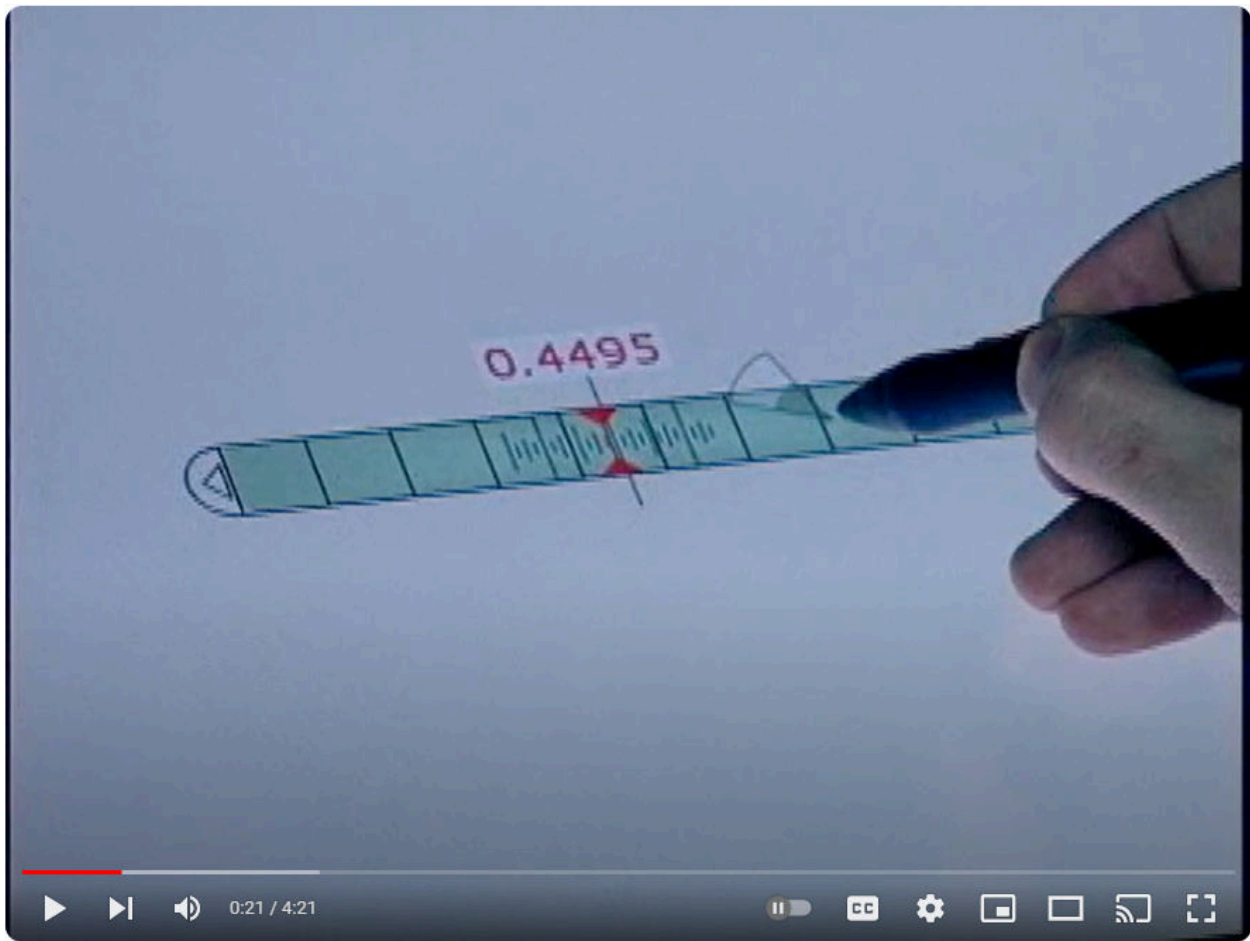


APPLE-1005, 3:19

In a more generic demonstration of the Zlender device, the Ramos Video further illustrates how changing the pressure applied to the touch screen (as indicated by the pressure cursor) causes movement of the plurality of markings relative to one another, illustrated below. APPLE-1005, 0:14-0:27; APPLE-1003, ¶97.



APPLE-1005, 0:16 (pressure cursor indicating little to no pressure applied)

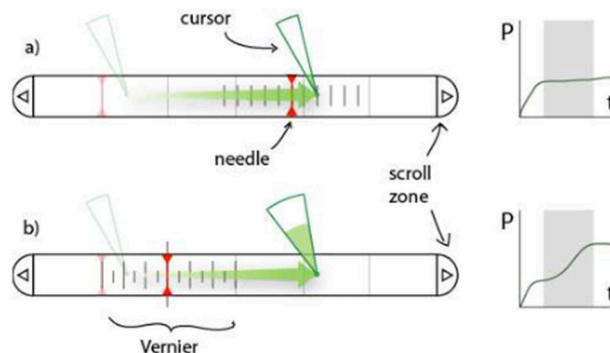


APPLE-1005, 0:21 (pressure cursor indicating a medium level of pressure applied)

The Ramos Paper explains that “the Vernier in our Zlider adapts its *grid spacing depending on the widget’s current scale factor*.” APPLE-1004, 3 (emphasis added). That is, when a user touches the markings and presses down (changing the pressure applied to the touch screen), the scale factor for zoom changes, causing the one or more markings to move in the second virtual display layer. APPLE-1003, ¶98. In this way, the markings in the Vernier displayed in the second virtual display layer are moved as a function of the pressure applied in the

touch movement. *Id.*; APPLE-1004, 3.

Additionally, the Ramos Video shows that touching the markings and moving the cursor along the working area (without changing pressure) causes the Vernier's markings to move in correspondence with the cursor's movement, and thus the Vernier moves as a function of the cursor's movement. APPLE-1005, 3:10-3:15; APPLE-1003, ¶99. The Ramos Video also shows that if the user moves the cursor along the working area while *concurrently* adjusting pressure, then the Vernier's markings move as a function of both the movement of the cursor along the working area and as a function of the pressure. APPLE-1005, 3:16-3:21; APPLE-1003, ¶99. The movement of the Vernier as a function of both the cursor's movement and of pressure is also conveyed in Figure 1 of the Ramos Paper:



APPLE-1004, FIG. 1.

In the combination, during the touch movement (e.g., sliding and/or

changing the amount of pressure applied to the touch screen), the RROD displays, on the touch screen, movement of the markings in the Vernier in the second virtual display layer, as Ramos Paper and Ramos Video teach. APPLE-1003, ¶100.

Additionally, as Ramos Paper and Ramos Video teach or suggest, the movement of the markings in the Vernier is a function of the touch movement (e.g., the amount of pressure applied to the touch screen or the amount of sliding on the touch screen). *Id.*

[1.k]

The RROD renders obvious [1.k]. APPLE-1003, ¶101.

The Ramos Video at 3:24 shows that pressing down on the markings (Vernier) causes the zoom scale factor to change, thus changing the “grid spacing,” as the Ramos Paper explains, which causes movement of the plurality of markings. APPLE-1005, 3:24. The change in scale of the Vernier causes a corresponding change in the zoom level in the displayed content of the first virtual display layer (e.g., making content appear larger). APPLE-1003, ¶101. The zoom operation on the contents disclosed in the Ramos Video is an image magnification function that is applied equally on two dimensions (x and y). *Id.*

The Ramos Video thereby discloses an image magnification function (i.e., a zoom operation) on an image, where the zoom corresponds with the scale of the Vernier. APPLE-1005, 3:07-3:32; APPLE-1003, ¶102. In addition, a POSITA

would have understood that, in the Ramos Video, the zoom operation applied to the content is not performed on the Vernier for at least two reasons. APPLE-1003, ¶102.

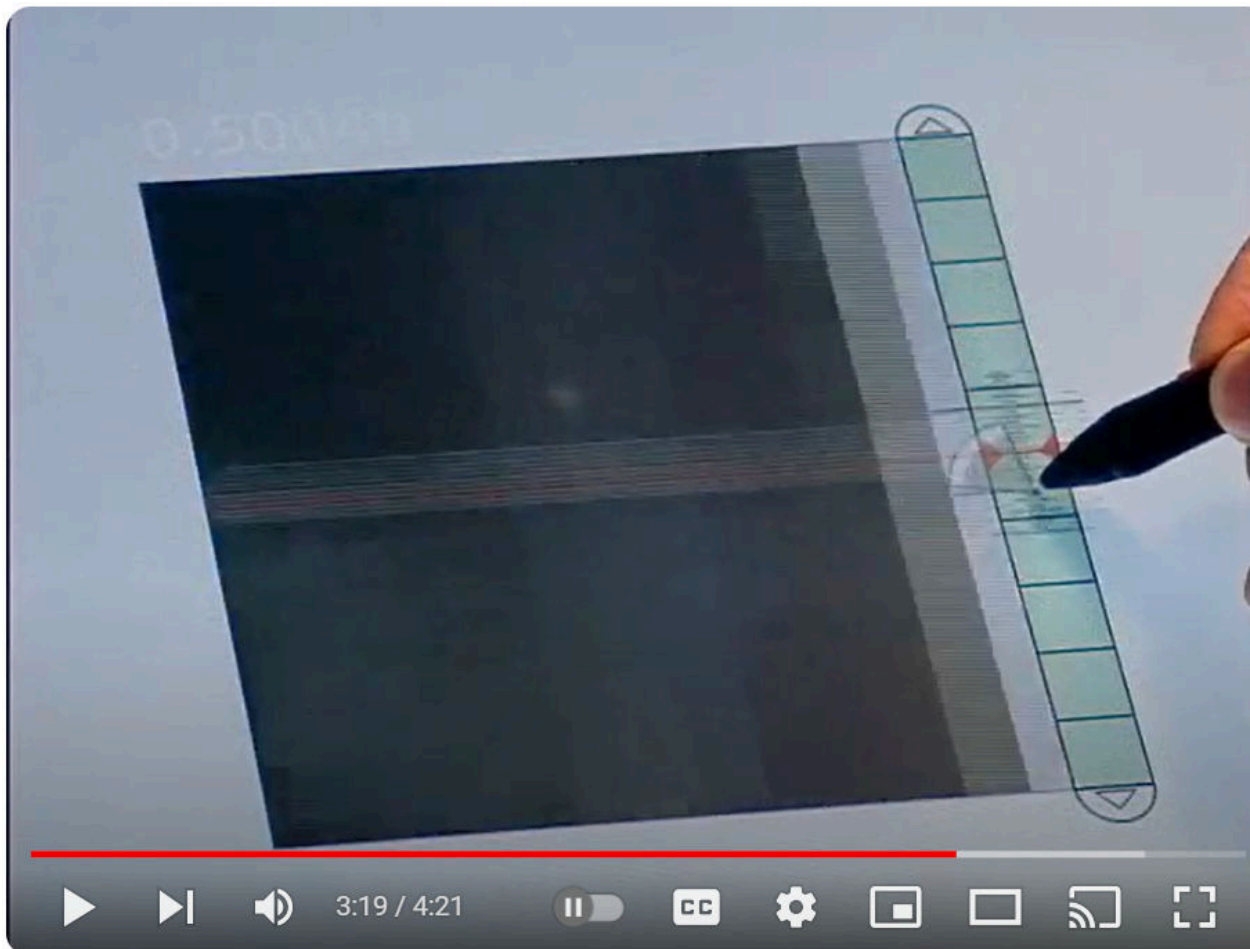
First, the Vernier in the Ramos Video is a widget that is composed of a grid of lines, where the grid spacing is adapted according to the current precision level: “the Vernier adapts its grid spacing depending on the widget’s current precision.” APPLE-1005, 0:55-1:00. Thus, as the pressure is varied, the grid spacing is varied, but the grid lines comprising the Vernier are not magnified – they remain the same thickness throughout. APPLE-1003, ¶103. The two-dimensional image magnification function applied to the image in the Ramos Video is not applied to the Vernier. *Id.*; *see, generally*, APPLE-1005. The Ramos Paper also confirms that “the Vernier in our Zlider adapts its grid spacing depending on the widget’s current scale factor.” APPLE-1004, 3.

Second, the pressure-based scale precision mechanism disclosed by the Ramos Video is not influenced by any zoom operation applied to the content. APPLE-1003, ¶104. While the scale factor of the Vernier *does* influence the magnification level (a zoom operation) applied to the content, the reverse is not true (i.e., the zoom operation applied to the content is not applied to the Vernier). *Id.*; *see, generally*, APPLE-1005. Rather, in the Ramos Video, the pressure applied to the working area determines the Vernier’s scale factor (also referred to

as “precision” and “granularity.” APPLE-1005, 0:07-0:10, 1:00-1:07. The Vernier’s control of scale precision can be applied to many functions in the content, including variable precision control of location within a video. APPLE-1005, 2:46-3:06. The Ramos Video, therefore, shows the Zlider grid spacing functioning in an identical manner, regardless of whether the content that it controls is zooming an image or “scrubbing” through a video that displays no zooming at all. *Id.*; APPLE-1003, ¶104. Thus, any change in scale of the Vernier is not the “zooming” function applied to the content. *Id.* Similarly, the Ramos Paper describes the Zlider as a broadly applicable strategy for “high precision parameter manipulation,” rather than a widget control that is functionally bound to two-dimensional image magnification. APPLE-1004, Title, 1, 3, 9.



APPLE-1005, 3:16 (showing the contents before the user increases pressure on the touchscreen)



APPLE-1005, 3:19 (showing the enlarged size of the content (image) after the user increases pressure on the touchscreen, as indicated by the pressure cursor, and the plurality of markings of the Vernier moving closer together)

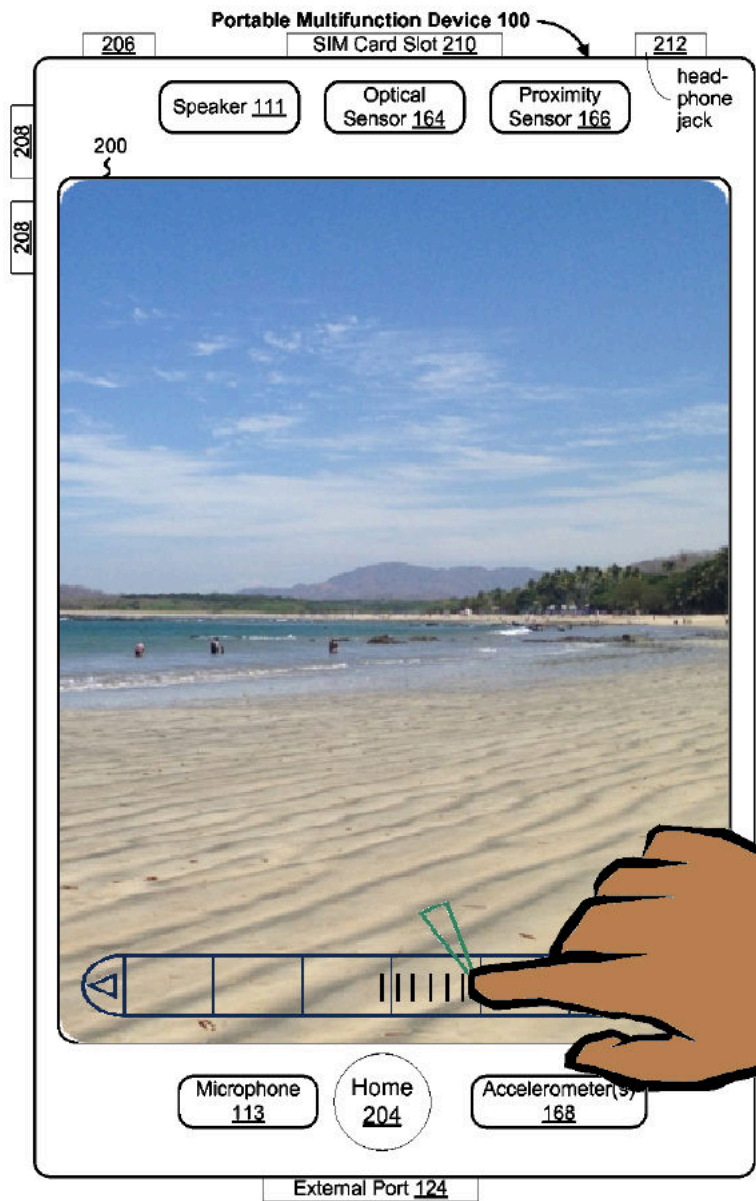
6. Claim 2

[2]

The RROD renders obvious [2]. APPLE-1003, ¶105. As discussed above in §IV.A.4, the RROD includes the Zlider widget of Ramos Paper and Video implemented in Ording’s device, which includes a camera. APPLE-1003, ¶105. Specifically, the RROD includes “an imaging module 143 (also called a camera module)” and an “optical sensor 164” used with the imaging module to “capture

still images or video,” as Ording teaches. APPLE-1006, [0047], FIG. 2.

With the camera module and optical sensor, the “touch screen display” of the RROD can “be used as a viewfinder for either still and/or video image acquisition.” APPLE-1006, [0047] The widget, consistent with the teachings of the Ramos Paper and Ramos Video, is further provided in the RROD in various applications where an “integrated input device for fluid zooming” would be desirable, such as a “[g]raphic application” or any application that displays “a high resolution image.” APPLE-1004, 1, 2, 3. A POSITA would have understood that the “camera module 143” (Application) is a graphic application that displays high resolution images (e.g., live images shown on the touchscreen as it acts as a viewfinder, or images that the camera has captured) so it would have been obvious to provide the widget, as taught by the Ramos Paper and the Ramos Video, as a UI element from which users could benefit. APPLE-1003, ¶106; APPLE-1006, [0082] (“camera module 143 may be used to capture still images or video (including a video stream) and store them into memory 102, modify characteristics of a still image or video, or delete a still image or video from memory 102”), FIG. 2A (reference numbers 136, 143). Moreover, in use, the camera module of the RROD would display the live images on the touchscreen (acting as a viewfinder) in a first virtual display layer and further display the widget in a second virtual display layer over the live images, as illustrated below. APPLE-1003, ¶106.



APPLE-1006, FIG. 2 (modified) with Ramos Zlider; APPLE-1003, ¶106

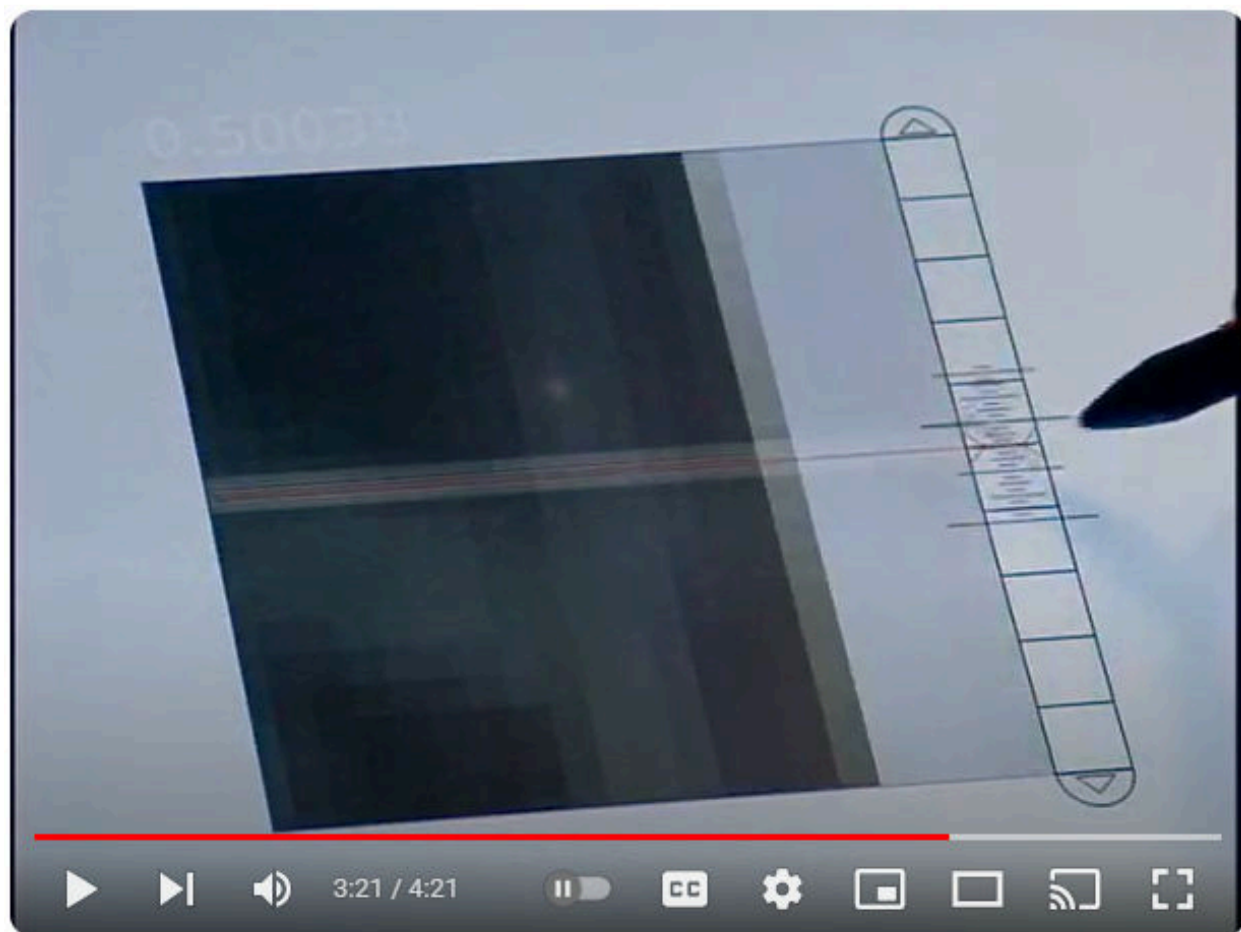
7. Claim 3

[3]

The RROD renders obvious [3]. APPLE-1003, ¶107.

The Ramos Video shows that the plurality of markings persist on the touch

screen display for a small period of time, even after cessation of the touch, before no longer being displayed. APPLE-1005, 3:21-3:22; APPLE-1003, ¶107.



APPLE-1005, 3:21 (cessation of touch but markings remain)



APPLE-1005, 3:22 (cessation of touch; no display of markings)

8. Claim 4

[4]

The RROD renders obvious [4]. APPLE-1003, ¶108.

The Ramos Paper explains that the Zlider can be implemented as a “Zliding Wheel,” which “operates by the same principle as a knob control with the exception that one can control the granularity of the wheel’s increments.” APPLE-1004, 9, FIG. 13. The Zliding Wheel shows a plurality of markings in the area labeled “scale ring,” in Figure 13 below. *Id.*; APPLE-1003, ¶108.

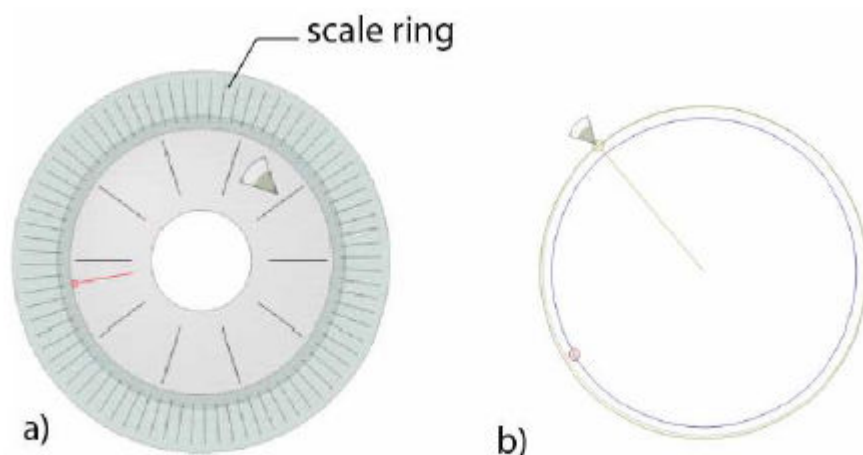


Figure 13: Sliding Wheels.

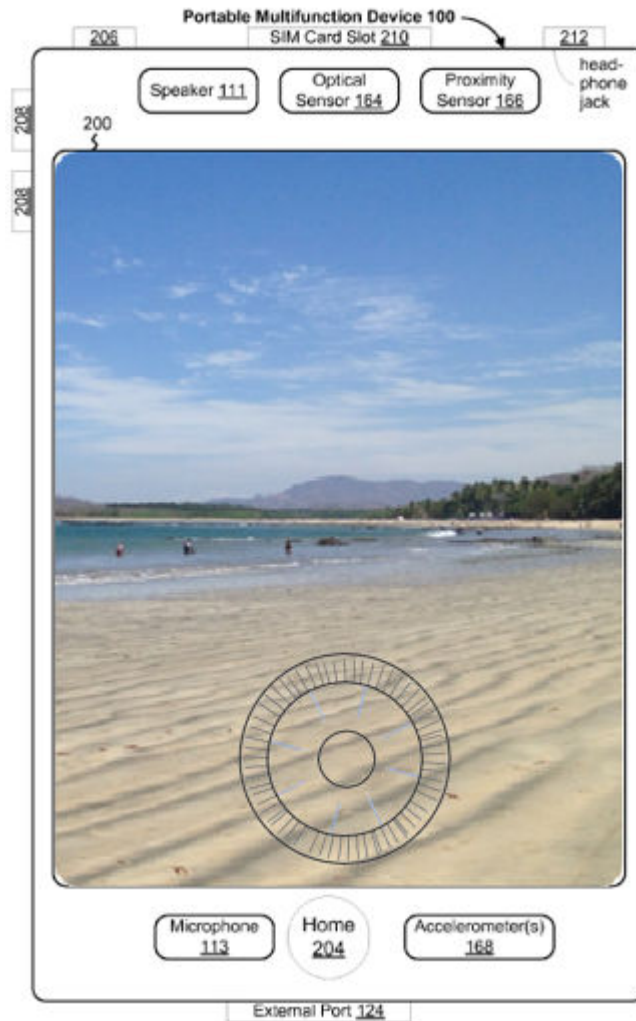
APPLE-1004, FIG. 13

The Ramos Video also shows that the Zlider can be implemented as a virtual dial with a plurality of markings. APPLE-1005, 3:36 (“here we see an example of a sliding wheel”). APPE-1003, ¶109.



APPLE-1005, 3:36

Ording further teaches the use of “a virtual click wheel as an input control device 116.” APPLE-1006, [0045]. Thus, it would have been obvious to implement the widget as a sliding wheel, as Ramos Paper, Ramos Video, and Ording teach, according to the combination discussed with respect to claim 1 (i.e., in a second virtual layer, semitransparent, etc.). APPLE-1003, ¶110. An example of the combination is shown below. *Id.*



APPLE-1006, FIG. 2 (modified) with transparent widget wheel; APPLE-1003,

¶110

9. Claim 6

[6]

The RROD renders obvious [6]. APPLE-1003, ¶111. The Ramos Video shows several touches that cause the Vernier to be displayed on the touch screen, including touches that are dynamic (i.e., involve movement). APPLE-1005, 0:007-

0:08, 0:14-0:26, 0:41-1:07, 1:09-1:13, 3:07-3:31. Additionally, Ording teaches various types of user inputs, including ones that involve movement: “one or more swipes (from left to right, right to left, upward and/or downward) and/or a rolling of a finger (from right to left, left to right, upward and/or downward) that has made contact with the device.” APPLE-1006, [0096]. In the combination, valid touches that cause the Vernier to be displayed on the RROD include any number of touches, including the moving touches shown in the Ramos Video and the movement touches described in Ording, all of which a POSITA would have understood as having at least a portion as being dynamic. APPLE-1003, ¶111; APPLE-1001, 59:59-63 (“a dynamic gesture is a gesture that requires movement across or in proximity to an interaction surface”).

10. Claim 7

[7]

The RROD renders obvious [7]. APPLE-1003, ¶112. The Ramos Video shows the user making a single continuous touch movement that includes the user moving a stylus within proximity of the touch screen (causing display of the Vernier on the working area), and continue moving on the touchscreen along the Zlider and during the continuous touch movement, both the markings are displayed and the zoom operation is performed, as discussed with respect to [1.h] and [1.j]-[1.k]. APPLE-1003, ¶112; APPLE-1005, 3:07-3:22.

11. Claim 8

[8]

The RROD renders obvious [8]. APPLE-1003, ¶113. In addition to showing how the touch can be part of the touch movement discussed in [7], the Ramos Video further shows how the plurality of markings can be made to appear in a separate touch (with a cessation between touches) from the touch movement (e.g., another touch) that causes the zoom operation. APPLE-1003, ¶113; APPLE-1005, 3:11-3:30.

12. Claim 9

[9]

The RROD renders obvious [9]. APPLE-1003, ¶114.

As further discussed above for [1.h], a POSITA would have found recognized or at least found obvious, based on *Ording*, that a touch has at least a duration and a length that are used to determine whether the touch is intentional and identify the type of gesture. APPLE-1003, ¶114; §IV.A.5. Indeed, *Ording* recognizes a “time period” associated with a finger’s contact with a touch screen, and using such information to identify a touch was well known by the Critical Date. APPLE-1003, ¶114; APPLE-1004, [0141]; *see* APPLE-1020, [0033] (“ignore or reject any touches that have a duration that is less than a predetermined minimum amount of time”). In the RROD, the touch includes a duration aspect

that is used to determine the type of touch (e.g., tap or swipe) and/or whether it is valid (e.g., intentional). APPLE-1003, ¶114; APPLE-1004, [0141]; *see* APPLE-1020, [0033], [0048]; §IV.A.5.

13. Claim 10

[10]

The RROD renders obvious [9]. APPLE-1003, ¶115.

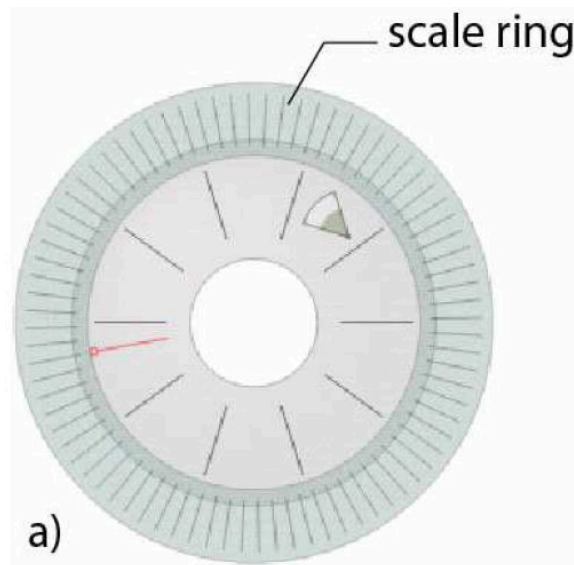
As further discussed above for [1.h], a POSITA would have found recognized or at least found obvious, based on *Ording*, that a touch has at least a duration and a length that are used to determine whether the touch is intentional and identify the type of gesture. APPLE-1003, ¶115; §IV.A.5. Indeed, *Ording* recognizes gestures that involve movement between an initial position and a final position (e.g., “one or more swipes (from left to right, right to left, upward and/or downward), and using such information to identify a touch was well known by the Critical Date. APPLE-1003, ¶115; APPLE-1004, [0096]; *see* APPLE-1020, [0033] (“ignore or reject touches that do not traverse a predetermined minimum portion of the touch element”). In the RROD, the touch includes a distance aspect that is used to determine the type of touch (e.g., tap or swipe) and/or whether it is valid (e.g., intentional). APPLE-1003, ¶115; APPLE-1004, [0096]; *see* APPLE-1020, [0033], [0048]; §IV.A.5.

14. Claim 17

[17]

The RROD renders obvious [17]. APPLE-1003, ¶116.

The Ramos Paper teaches that the Zlider can be implemented as a Zliding wheel. APPLE-1004, 9; APPLE-1003, ¶116. It explains that a “scale ring is displayed above the wheel when its scale factor > 1 , and provides a ‘gear-like feedback’, which helps users understand the differences between the wheel’s and the pointer’s absolute motion.” APPLE-1004, 1.



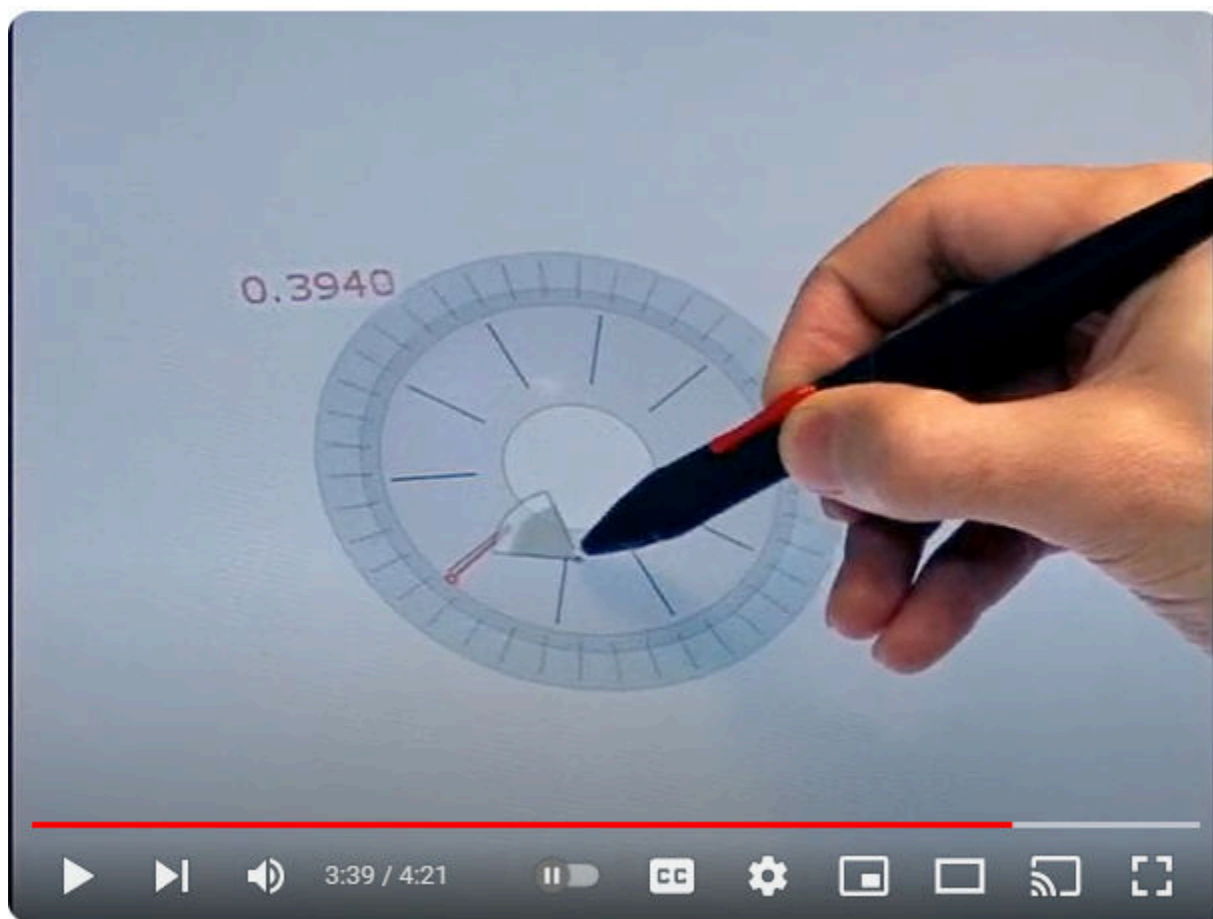
APPLE-1004, 9 (FIG. 13(a))

The Ramos Video further illustrates how the Zlider Wheel operates. APPLE-1003, ¶117. At 3:37, the scale factor < 1 , so the scale ring outside the Zliding wheel is not displayed, as shown below. APPLE-1005, 3:37.



APPLE-1005, 3:37

At 3:39, the scale factor >1 , so the scale ring outside the Zliding wheel is displayed, as shown below. APPLE-1005, 3:39.



APPLE-1005, 3:39

At 3:41, the user gesture has included a rotation movement around the
Zliding wheel (note the change in the stylus's location) so the markings in the scale
ring have correspondingly rotated, as shown below. APPLE-1005, 3:41; APPLE-
1003, ¶119.



APPLE-1005, 3:41

While not shown in the video, the zoom operation varies with the radius of the wheel, which would have been obvious to a POSITA because Ramos Paper and Ramos Video both explain that the Zliding wheel is simply an alternative to the linear Zlider. APPLE-1003, ¶120.

15. Claim 19

[19]

The RROD renders obvious [19]. APPLE-1003, ¶121. The Ramos Paper explains that the “Zlider also displays a Vernier,” which is plurality of markings.

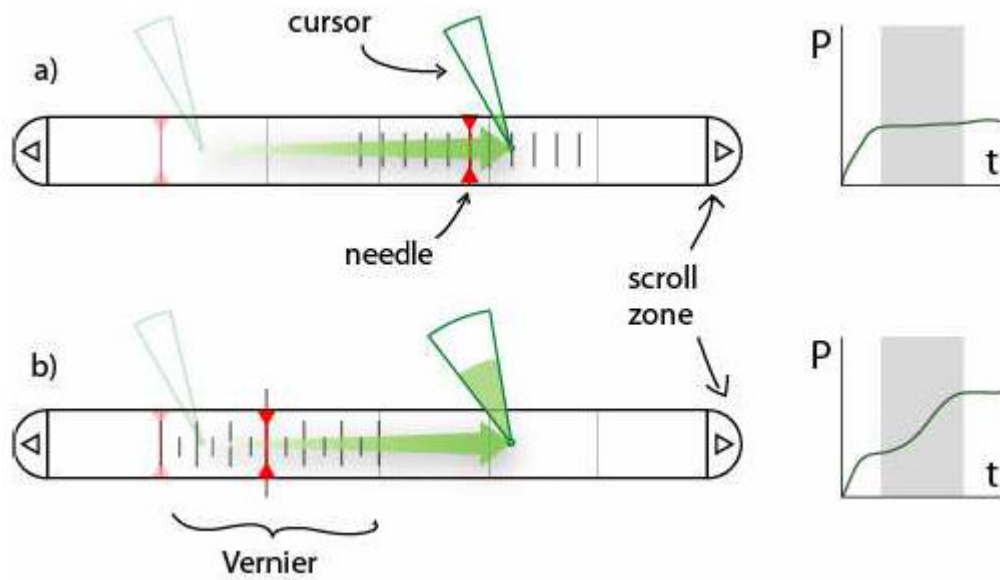
APPLE-1004, 3. The Ramos Paper also explains that the “Zlider widget ... consists of a rectangular working area.” *Id.* Since the Vernier and the working area are both part of the Zlider widget, a POSITA would have understood that the Vernier is displayed on the same (second) virtual layer as the working area (user interface element) because they are components of the same widget. APPLE-1003, ¶121.

16. Claim 22

[22.pre]

To the extent the preamble is limiting, the RROD renders obvious [22.pre]. APPLE-1003, ¶122; §§IV.A.4-5. In particular, the Ramos Paper describes “Zoom Sliding, or *Zliding*, for fluid integrated manipulation of scale (zooming) via pressure input while parameter manipulation within that scale is achieved via x-y cursor movement (sliding).” APPLE-1004, 1 (Abstract) (“input techniques for use with the Zlider”). It further describes a method “in which users use the pressure modality to fluidly and explicitly *zoom* or adjust the granularity of the parameter space, while *sliding* or dragging the input device to perform high pressure parameter manipulation within that zoomed parameter space.” *Id.*, 1. As shown in Figure 1 (below), “Zliding on the Zlider widget” can involve a “user manipulat[ing] a parameter at a coarse granularity by sliding through the control while applying low pressure with the transducer,” or “pressing harder [to]

increase[] the granularity of the parameter space.” *Id.*, 1, FIG. 1.



APPLE-1004, FIG. 1

[22.a]

See [1.pre]-[1.d].

[22.b]

See [1.e].

[22.c]

See [1.g].

[22.d]

See [1.h].

[22.e]

See [1.i]. The “touch movement” of [1.i] corresponds to “another touch.”

APPLE-1003, ¶127.

[22.f]

See [1.j].

[22.g]

See [1.k].

17. Claim 23

[23]

See [2].

18. Claim 24

[24]

See [3].

19. Claim 25

[25]

See [4].

20. Claim 26

[26]

The RROD renders obvious [26]. APPLE-1003, ¶133. The Ramos Paper shows the plurality of markings as part of a slider (i.e., “Zlider”). APPLE-1004, 1 (“introduces the notion of Zoom Sliding, or *Zliding*”), 4 (“consistent with the behavior of regular slider controls”), FIG. 1.

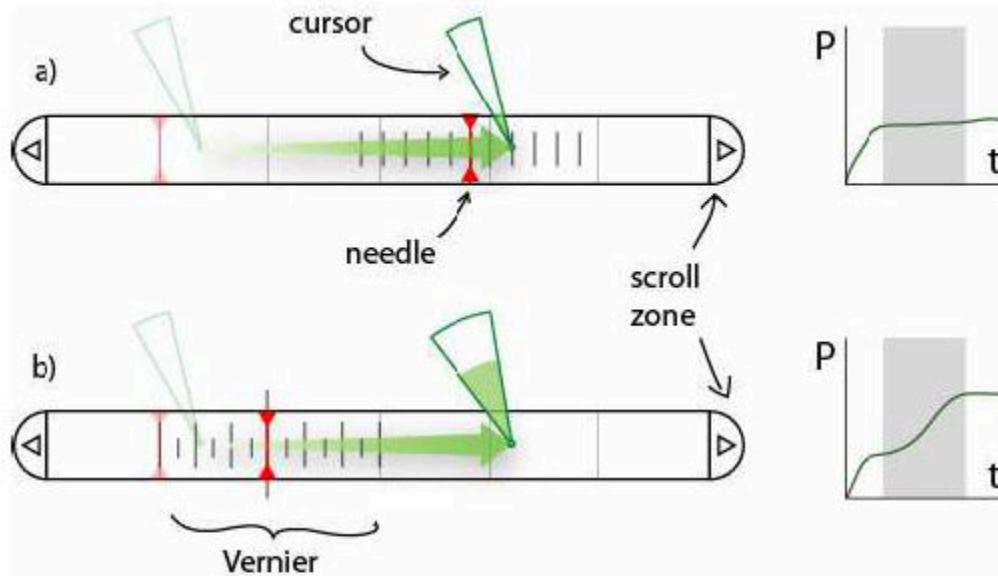


Figure 1: Zliding on the Zlider widget. a) A user manipulates a parameter at coarse granularity by sliding through the control while applying low pressure with the pressure transducer. b) The same x-y sliding action while pressing harder increases the granularity of the parameter space, allowing for more precise parameter manipulation when desired. The graphs on the right plot pressure over time, with the interval when the sliding occurs highlighted.

APPLE-1004, FIG. 1

21. Claim 28

[28]

See [6].

22. Claim 29

[29]

See [7].

23. Claim 30

[30]

See [8].

24. Claim 32

[32]

See [9].

25. Claim 33

[33]

See [10].

26. Claim 36

[36]

See [1.g].

27. Claim 41

[41]

See [17].

28. Claim 58

[58.pre]

See [1.pre], [1.a], [1.d], [22.pre].

[58.a]

See [1.pre]-[1.d].

[58.b]

See [1.e].

[58.c]

See [1.g].

[58.d]

See [1.h].

[58.e]

See [1.i]. The “touch movement” of [1.i] corresponds to “another touch.”

APPLE-1003, ¶146.

[58.f]

See [1.j].

[58.g]

See [1.k].

29. Claim 59

[59]

See [2].

30. Claim 60

[60]

See [3].

31. Claim 61

[61]

See [4].

32. Claim 62

[62]

See [26].

33. Claim 64

[64]

See [6].

34. Claim 65

[65]

See [7].

35. Claim 67

[67]

See [8].

36. Claim 69

[69]

See [9].

37. Claim 70

[70]

See [10].

38. Claim 73

[73]

See [37].

39. Claim 77

[77]

See [17].

40. Claim 82

[82]

See [46].

41. Claim 83

[83]

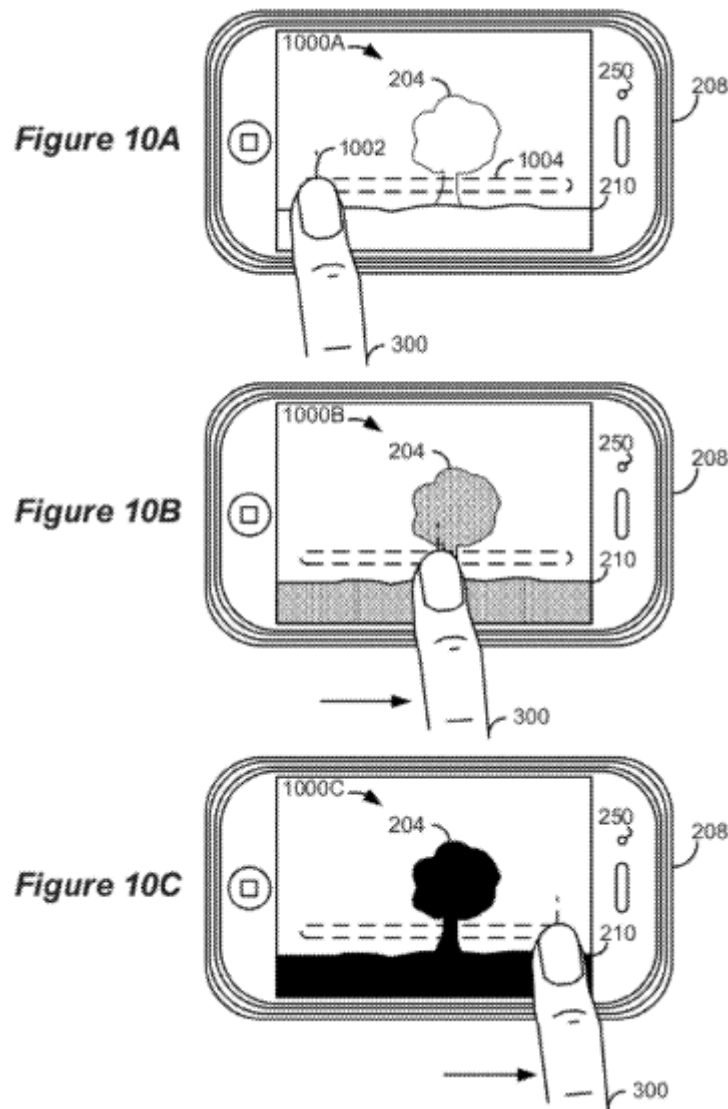
See [47].

B. [GROUND 1B] – The Ramos Paper-Ramos Video-Ording-Hayward Combination renders obvious claim 48

1. Hayward

Hayward is directed to “mapping particular user interactions, e.g., gestures, to the input parameters of various image processing routines.” APPLE-1004, Abstract; APPLE-1003, ¶162.

With reference to Figures 10A-10C (below), Hayward describes “logical slider 1004 ... in dashed lines on device 208 with logical handle 1002 also shown in dashed lines on device 208 and representing the current location of the user 300’s finger with respect to where the gesture was initiated.” APPLE-1016, [0067]; APPLE-1003, ¶163.



APPLE-1016, FIGS. 10A-10C

As shown in Figure 10B, “the user 300’s finger has moved roughly halfway across the width of touch screen 210, and, accordingly, scene 1000B comprising tree 204 shows a higher level of contrast between the tree 204 and the background sky than scene 1000A.” APPLE-1016, [0067]. “As shown in Figure 10C, the user 300’s finger has moved all the way to the right hand side of touch screen 210,

indicating that the user wishes the image filter to apply the maximum allowable amount of contrast to the captured image data, and, accordingly, scene 1000C comprising tree 204 shows the highest level of contrast between the tree 204 and the background sky, when compared to scenes 1000A and 1000B.” *Id.*, [0067]; APPLE-1003, ¶164.

While these disclosures in Hayward refer to input gestures that are performed with the finger, Hayward also states that “[t]he user 300 may make contact with the touch screen 210 using any suitable object or appendage, such as a stylus, a finger, and so forth.” APPLE-1016, 6:49-54; APPLE-1003, ¶165.

2. The Ramos Paper-Ramos Video-Ording-Hayward Combination

As discussed above in §IV.A.4, the RROD includes a widget implemented in a “multifunctional device” based on the teachings of Ording, which includes various software and hardware components, including various applications for using a widget like Zlider and a camera. APPLE-1003, ¶166; *see* §IV.A. A POSITA would have found it obvious to improve RROD by using its slider to modify parameters, such as the contrast in an image. APPLE-1003, ¶166. Indeed, Ramos Paper identifies “[e]xample scenarios where users may need to fluidly adjust the scale of the parameter space in order to make precise parameter adjustments,” including “[g]raphic applications.” APPLE-1004, 2. More,

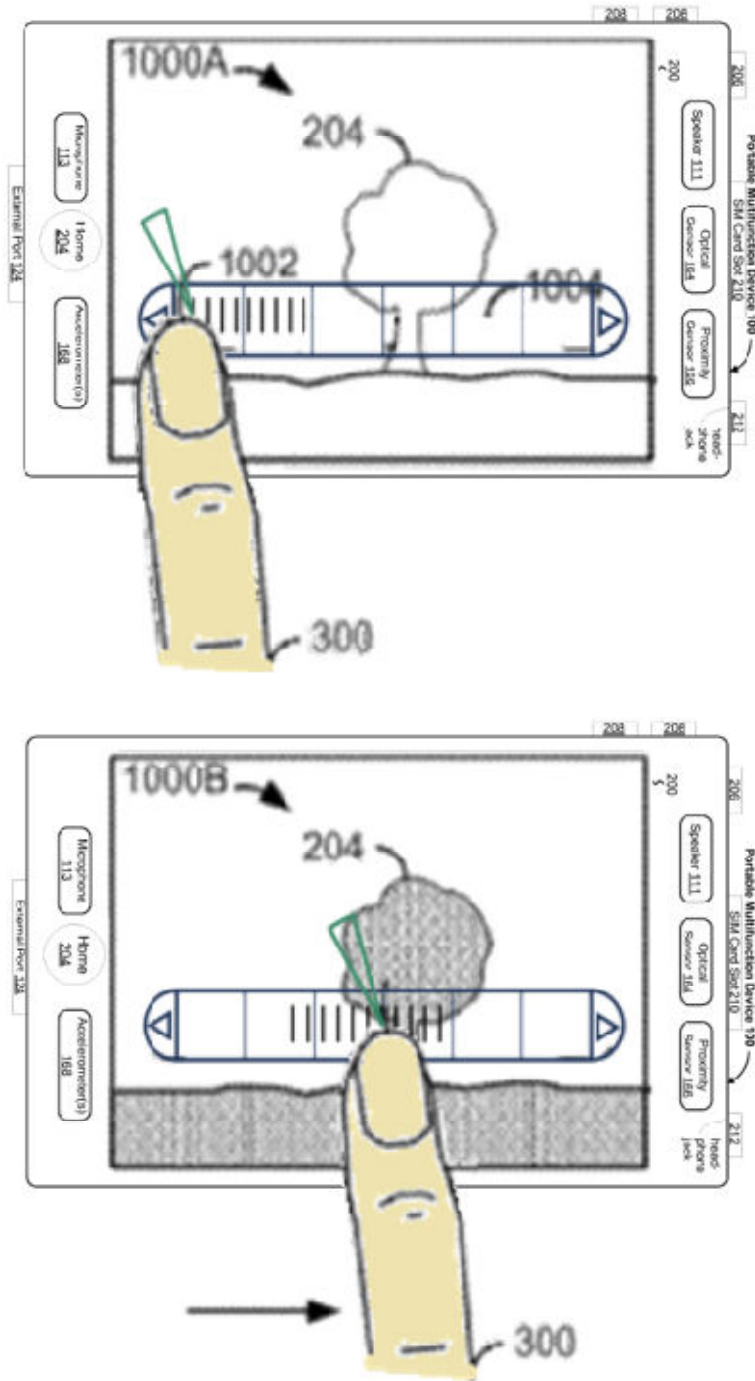
Hayward teaches the use of a slider for adjusting the level of contrast in a scene.

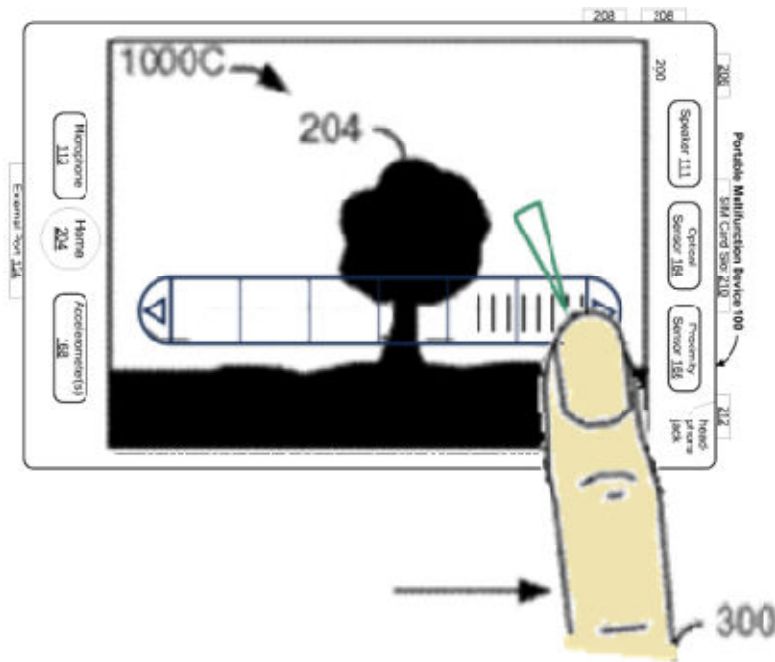
APPLE-1016, [0067], FIGS. 10A-10C. And, Ording additionally describes the use of its device's "camera module" for "still and/or video image acquisition" using a "digital camera application" and/or a "digital video camera application." APPLE-1006, [0027], [0047].

A POSITA would have found it obvious to modify the RROD with Hayward's teachings to include a separate widget (as taught by Ramos Paper and Ramos Video) for use in adjusting exposure levels (as taught by Hayward) when using a camera applications/camera module, as described in Ording. APPLE-1003, ¶167; §IV.B.2. Doing so would result in a device that allows for "precise[] adjust[ment] of a value controlling a visual feature"—that is, contrast levels when acquiring digital images—for which Ramos teaches its Zlider can be applied. APPLE-1003, ¶167; APPLE-1004, 2.

In the Ramos Paper-Ramos Video-Ording-Hayward device ("RROHD"), a Zlider, as taught by Ramos Paper and Ramos Video, would be provided as a semitransparent widget, as suggested by Ramos Video and taught by Ording, in a multifunctional device, as Ording teaches—and, in particular, for use with its digital camera applications—as a mechanism for receiving user inputs to adjust the contrast of a scene, as taught by Hayward. APPLE-1003, ¶168; APPLE-1004, 1, 3, FIG. 1; APPLE-1005; APPLE-1006, [0045], FIG. 2; APPLE-1016, [0067], FIGS.

10A-10C. The composite images below (based on graphics provided within
Ordering of its device, Ramos of its Zlider, and Hayward of its contrast-changing
slider) provide one possible implementation of the RROHD. APPLE-1003, ¶168.





APPLE-1003, ¶168

Deploying a slider within a device (based on Ramos and Ording) for contrast adjustment (as Hayward teaches) would have required only routine programming knowledge well within the skill of a POSITA prior to the Critical Date. APPLE-1003, ¶169. Indeed, the change would have amounted to nothing more than the use of a known technique to improve similar devices – in each instance having a touch screen display – in a similar way, and combining prior art elements according to known methods to yield the predictable results described above. *KSR*, 550 U.S. at 417; APPLE-1003, ¶169.

3. Claim 48

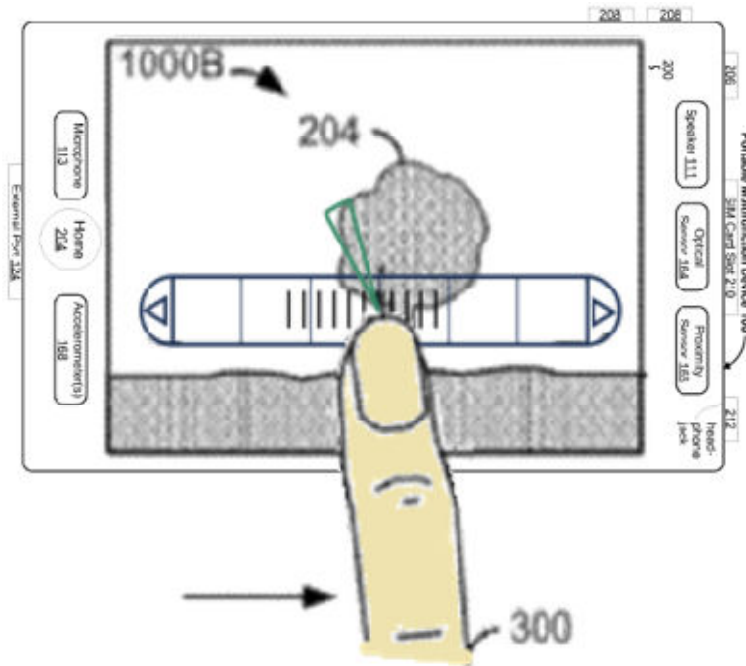
[48]

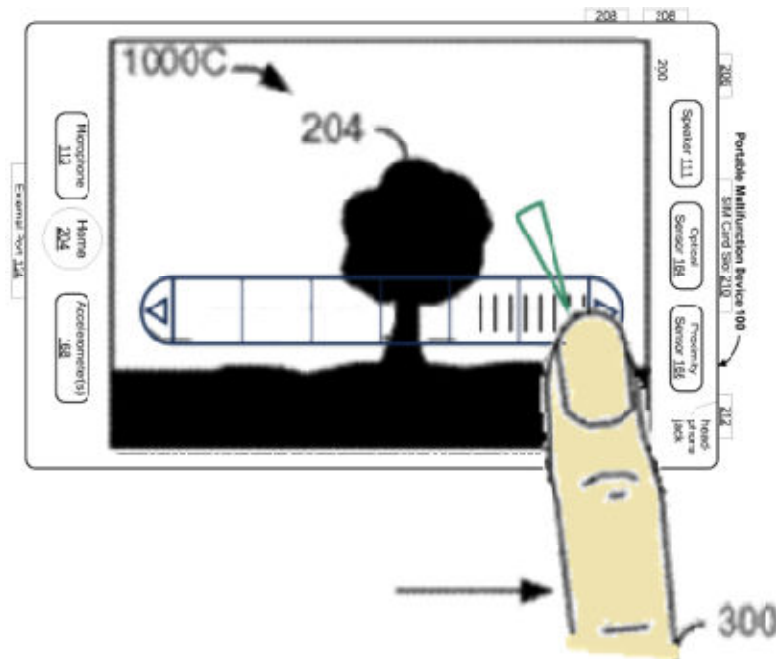
The RROHD renders obvious [48]. APPLE-1003, ¶170.

As discussed above with respect to Ground 1A, the RROD renders obvious claims 22 and 23 on which claim 48 depends. As further discussed above in §IV.B.2, a POSITA would have found it obvious to modify the RROD with Hayward to include a separate widget (as taught by Ramos Paper and Ramos Video) for use in adjusting exposure levels (as taught by Hayward). APPLE-1003, ¶170; APPLE-1016, [0067], FIGS. 10A-10C; §IV.B.2.

A POSITA would have understood or found obvious that a user using the widget of the RROHD would touch the plurality of markings on the RROHD contrast Zlider (as shown in the composite image below) presented in the second virtual display layer, as taught by Ramos Paper and Ramos Video, and slide his/her input along the widget to move the markings to adjust the level of contrast on the scene displayed on the first virtual display layer, for example, when using a digital camera application, as Ording teaches. APPLE-1003, ¶171; APPLE-1016, [0067]; FIGS. 10A-10C. As Hayward explains, when the user's input "has moved roughly halfway across the width of the touch screen," the scene "shows a higher level of contrast," and when the user's input "has moved all the way to the right hand side of the touch screen," "the maximum allowable amount of contrast" is applied to the image data. APPLE-1004, 11:30-42, FIGS. 10A-10C. In this way, the lighting operation (change in contrast) is performed based on a movement of one or more of a plurality of different markings in the second virtual display layer (where the

markings of the widget move in response to the user's finger moving across the touch screen). APPLE-1003, ¶171. Additionally, because the widget is at least partially translucent, as suggested by Ramos Paper and Ramos Video and taught by Ording, the result of the lighting operation (contrast change) on the at least portion of the contents of the first virtual display layer (image data) is visible through the at least portion of the second virtual display layer, illustrated below. APPLE-1003, ¶171; §IV.A.4.





APPLE-1003, ¶171

I. ANALYSIS ON DISCRETION

A. 35 U.S.C. §325(d)—*Advanced Bionics*

The *Advanced Bionics* framework strongly favors institution. None of the prior art relied upon for Grounds 1A-1B were cited among the thousands of references disclosed by Applicant and/or cited by the Examiner. Nor did either the Applicant or Examiner explicitly discuss or consider the combinations presented herein. Thus, neither condition of Part One in the *Advanced Bionics* two-part framework is met.

Further, while there is no need to reach Part Two of the *Advanced Bionics* framework, the record shows that the Challenged Claims were allowed based on a material error by the Examiner at least as illustrated by the Grounds presented

herein. Had the Examiner properly assessed the references relied upon for Grounds 1A-1B and appreciated their teachings in view of the prior art as a whole, the Challenged Claims would not have issued. *See* §IV, *supra*.

B. 35 U.S.C. §314(a) - *Fintiv*

Institution should not be discretionarily denied under §314(a) because no *Fintiv* factors favor denial. Rather, five of the six factors enumerated in *Apple Inc. v. Fintiv, Inc.* weigh against discretionary denial, and the other factor is neutral on the issue. IPR2020-00019, Paper 11 at 2-3 (PTAB “precedential” Mar. 20, 2020) (“*Fintiv*”).

Factor 1 weighs against a discretionary denial. Apple intends to file a motion to stay the parallel litigation. Thus, factor 1 does not favor discretionary denial and, at worst, is neutral.

Factor 2 weighs against a discretionary denial. Director Vidal’s Guidance instructed the Board that “when considering the proximity of the district court’s trial date to the date when the PTAB final written decision will be due, the PTAB will consider the median time from filing to disposition of the civil trial for the district in which the parallel litigation resides.” APPLE-1030, 3, 8. According to the latest published district court statistics, the median time to trial in the Southern District of California (SDCal) is 40.2 months, predicting a trial in November 2027—significantly later than a Final Written Decision would be issued in this

case. APPLE-1029, 69; APPLE-1030, 8 (“A court’s scheduled trial date, therefore, is not by itself a good indicator of whether the district court trial will occur before the statutory deadline for a final written decision.”). For this reason alone, Factor 2 weighs against discretionary denial. Though a pre-trial conference of October 23, 2025 has been scheduled in co-pending litigation, no trial date has been set, and it is uncertain whether the schedule will stick, particularly if Apple’s motion to stay is granted. APPLE-1031, 6.

Factor 3 also weighs against discretionary denial because Petitioner has diligently filed this Petition while the co-pending litigation is still in its early stages. Petitioner filed as soon as practicable following Smith’s election of 200 asserted claims of the over 1000 claims in the asserted patents just weeks before filing. Beyond the service of preliminary infringement contentions, the parties and the District Court have yet to expend significant resources. No invalidity contentions have been served, and discovery is in its infancy.

Factor 4 weighs against discretionary denial. As noted above, no trial date has been scheduled. And even if a pre-trial conference date of October 2025 is used as a reference point, if Apple’s to-be-filed motion to stay is granted, the case schedule is going to change and the trial date will be further delayed. Accordingly, it is likely that a final written decision will be issued before trial. Indeed, no stipulation has been offered given the lack of a trial date, and it otherwise remains

too early to assess the suitability of a stipulation with invalidity contentions still not exchanged.

Factor 5 The parties in the parallel co-pending litigation are the same.

Factor 6 favors institution because the merits of this Petition are compelling, as described in this Petition. Indeed, the grounds presented herein apply, in a straightforward manner, to demonstrate the obviousness of the claims. *See* §IV, *supra*.

II. CONCLUSION AND FEES

The Challenged Claims are unpatentable. Please charge fees to Deposit Account 06-1050.

III. MANDATORY NOTICES UNDER 37 C.F.R § 42.8(a)(1)

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

Apple Inc. is the petitioner and the real party-in-interest.

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

Petitioner is not aware of any disclaimers, reexamination certificates or petitions for inter partes review for the '580 Patent. The '580 patent is the subject of civil action: *Smith Interface Technologies, LLC v. Apple Inc.*, Case No. 3-23-cv-01187 (SDCA), filed June 27, 2023 and *Smith Interface Technologies, LLC v. Samsung Electronics Co., Ltd. et al.*, Case No. 2-22-cv-00290 (EDTX), filed July 29, 2022.

C. Lead And Back-Up Counsel Under 37 C.F.R. § 42.8(b)(3)

Petitioner provides the following designation of counsel.

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D. Service Information

Please address all correspondence and service to the address listed above.

Petitioner consents to electronic service by email at IPR50095-0165IP1@fr.com.

Respectfully submitted,

Dated: June 27, 2024

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CERTIFICATION UNDER 37 CFR § 42.24

Under the provisions of 37 CFR § 42.24(d), the undersigned hereby certifies that the word count for the foregoing Petition for *Inter Partes* Review totals 12,409 words, which is less than the 14,000 allowed under 37 CFR § 42.24.

Dated: June 27, 2024

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CERTIFICATE OF SERVICE

Pursuant to 37 CFR §§ 42.6(e)(4)(i) *et seq.* and 42.105(b), the undersigned certifies that on June 27, 2024, a complete and entire copy of this Petition for *Inter Partes* Review and all supporting exhibits were provided via USPS Priority Express Mail, to the Patent Owner by serving the correspondence address of record as follows:

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