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Memorandum

To: The Commission[1]

From: The Acting General Counsel[2]

Subject: Whether to review the Administrative Law Judge's final initial determination finding no violation in Inv. No. 337-TA-750, *Certain Mobile Devices and Related Software.*

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I.   Introduction

The Commission instituted this investigation on November 30, 2010, based on a

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[1] cc: Name of General Counsel, Name of Director of OINV, Name of Investigator, Name of Secretary.

[2] This memorandum was prepared by Name of Attorney (Attorney phone number).

complaint filed by Apple Inc., f/k/a Apple Computer, Inc., of Cupertino, California ("Apple"). 75 *Fed. Reg.* 74081-82. The complaint alleges violations of section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337 ("Section 337"), in the importation into the United States, the sale for importation, and the sale within the United States after importation of certain mobile devices and related software by reason of infringement of certain claims of U.S. Patent Nos. 7,812,828 ("the '828 Patent"); 7,663,607 ("the '607 Patent"); and 5,379,430 ("the '430 Patent") (collectively "the patents-in-suit"). The Commission's notice of investigation named Motorola, Inc. n/k/a Motorola Solutions of Schaumburg, Illinois ("Motorola, Inc.") and Motorola Mobility, Inc. of Libertyville, Illinois ("Motorola") as respondents. The Office of Unfair Import Investigation (Ms. Kattan) ("IA") was named as a participating party. On August 16, 2011, the presiding administrative law judge ("ALJ") (Judge Essex) issued an initial determination ("ID") granting a joint unopposed motion to terminate the investigation as to Motorola, Inc. *See* Order No. 10 (Aug. 16, 2011). The Commission determined not to review Order No. 10. *See* Notice (Aug. 31, 2011).

On January 13, 2012, the ALJ issued his final ID, finding no violation of Section 337. The ID also includes the ALJ's recommended determination ("RD") on remedy and bonding.

On January 30, 2012, Apple filed a petition for review of certain aspects of the final ID.[3] Also on January 30, 2012, Motorola filed a contingent petition for review of certain aspects of the final ID.[4] On February 7, 2012, Motorola filed a response to Apple's petition for review.[5]

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[3] Complainant Apple Inc.'s Petition For Review (Jan. 30, 2012) ("Apple's Pet.").

[4] Respondent Motorola Mobility Inc.'s Contingent Petition For Review (Jan. 30, 2012) ("Motorola's Pet.").

[5] Respondent Motorola Mobility Inc.'s Response To Complainant Apple Inc.'s Petition For Review (continued…)

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Also on February 7, 2012, Apple filed a response to Motorola's contingent petition for review.[6]

Further on February 7, 2012, the IA filed a joint response to both Apple's and Motorola's petitions.[7]

On February 23, Apple filed a post-RD statement on the public interest pursuant to Commission Rule 201.50(a)(4), along with a motion for leave to file the statement out of time.[8] On February 22, 2012, non-party Google Inc. filed a public interest statement in response to the post-RD Commission Notice issued on January 25, 2012.[9] *See* Corrected Notice of Request for Statements on the Public Interest (Jan. 25, 2012).

II. Summary of Recommendations

For the reasons set forth below, we recommend that the Commission determine to review the ID in part, and on review, to affirm the ID's finding of no violation of Section 337.

Specifically, we recommend that the Commission determine not to review the ID's construction of the limitation "mathematically fit(ting) an ellipse to at least one of [the one or more] pixel groups" in claims 1 and 10 of the '828 Patent. We also recommend that the Commission determine not to review the ID's construction of the claim limitation "specifying a

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(...continued)
(Feb. 7, 2012) ("Motorola's Resp.").

[6] Complainant Apple Inc.'s Response To Respondent Motorola Mobility Inc.'s Contingent Petition For Review (Feb. 7, 2012) (Apple's Resp.).

[7] Office Of Unfair Import Investigations' Response To Petitions For Review Of The Initial Determination (Feb. 7, 2012) ("IA's Resp.").

[8] Apple's Statement on the Public Interest (Feb. 22, 2012) ("Apple's PI Statement"); Apple's Unopposed Motion for Leave to File Statement on the Public Interest Out of Time (Feb. 23, 2012) ("Apple's Mot. for Leave").

[9] Submission of Non-Party Google Inc. in Response to the Commission's Request for Submissions on the Public Interest (Feb. 22, 2012).

target hardware or software component search criteria including one or more properties" in claim 1 of the '430 Patent.

We further recommend that the Commission determine not to review the ID's finding of non-infringement with respect to asserted claims 1, 2, 10, and 11 of the '828 Patent. We do recommend, however, that the Commission determine to review the ID for the limited purpose of clarifying that the ALJ also found claims 24-26, and 29 not infringed, and on review, to affirm this finding with clarification.

We also recommend that the Commission determine not to review the ID's finding that the asserted claims of the '607 Patent are anticipated under 35 U.S.C. § 102(e). We further recommend that the Commission determine not to review the ID's finding that the asserted claims of the '430 Patent are anticipated under 35 U.S.C. § 102(e).

We recommend that the Commission determine to review the ID's finding that the asserted claims of the '607 Patent are obvious under 35 U.S.C. § 103, and on review, to take no position on the issue. Finally, we recommend that the Commission issue the attached *Federal Register* notice.

III. Background

A. Procedural History

This investigation was instituted to consider alleged violations of Section 337 with regard to claims 1, 2, 10, 11, 24-26, and 29 of the '828 Patent, claims 1-7 and 10 of the '607 Patent, and claims 1, 3, and 5 of the '430 Patent. On July 28, 2011, the parties filed a joint motion to terminate the investigation as to Motorola, Inc. pursuant to Commission Rule 210.21(a)(1) (19 C.F.R. § 210.21(a)(1)) based on withdrawal of infringement allegations against

Motorola, Inc. On August 16, 2011, the ALJ issued an ID granting the motion. *See* Order No. 10 (Aug. 16, 2011). On August 31, 2011, the Commission issued a notice determining not to review Order No. 10. Notice (Aug. 31, 2011).

On August 28, 2011, Apple filed a motion for summary determination that it has satisfied the economic prong of the domestic industry requirement based on all three subsections of 19 U.S.C. § 1337(a)(3). On September 15, 2011, the ALJ issued an ID granting Apple's motion for summary determination with respect to 19 U.S.C. § 1337(a)(3)(C), but denied Apple's motion as to 19 U.S.C. § 1337(a)(3)(A) and (B). *See* Order No. 14 (Sept. 15, 2011). On October 14, 2011, the Commission issued a notice determining not to review Order No. 14. Notice (Oct. 14, 2011). On September 16, 2011, Apple and Motorola stipulated that Motorola has satisfied the importation requirement of 19 U.S.C. § 1337(a)(1)(B).

The ALJ held an evidentiary hearing on September 26-30, 2011. The ALJ thereafter received post-hearing briefing from the parties.

On January 13, 2012, the ALJ issued his final ID, finding no violation of Section 337. In particular, the ALJ found that the importation requirement of Section 337 is satisfied per the parties' stipulation. The ALJ also found that the accused products literally infringe the asserted claims of the '430 and '607 patents, but that the accused products do not literally infringe the asserted claims of the '828 Patent. The ALJ further found that the accused products do not infringe any of the asserted claims of the patents-in-suit under the Doctrine of Equivalents ("DOE"). The ALJ also found that the asserted claims of the '828 Patent are not invalid for anticipation under 35 U.S.C. § 102 or obviousness under 35 U.S.C. § 103. The ALJ further found that the asserted claims of the '430 Patent and the '607 Patent are invalid for anticipation

under 35 U.S.C. § 102. The ALJ also found that the asserted claims of the '607 Patent are invalid

for obviousness under 35 U.S.C. § 103. The ALJ further found that the asserted claims of the

'430 Patent are not invalid for failing to meet the requirements of written description,

enablement, indefiniteness, or best mode under 35 U.S.C. § 112. The ALJ also found that Apple

has standing to assert the '430 Patent and that Motorola is not licensed to practice the '430

Patent. The ALJ further found that Apple has satisfied the technical prong of the domestic

industry requirement pursuant to 19 U.S.C. § 1337 (a)(2) for all of the patents-in-suit.

The ALJ also issued a RD, recommending that the appropriate remedy is a limited

exclusion order barring entry of infringing mobile devices and related software and a cease and

desist order against Motorola. The ALJ also recommended that Motorola be required to post a

bond of no more than $200 per entered product that is covered under the '828 and/or '607

patents and 4.5% percent of the entered value of any accused product that is covered under

the '430 Patent that it seeks to import during the period of Presidential review.

On January 30, 2012, Apple filed a petition for review of certain aspects of the final ID.

See Apple's Pet. In particular, Apple requests that the Commission review the ID's construction

of the claim term "mathematically fit(ting) an ellipse" and "means for fitting an ellipse" in the

'828 Patent and, also, review the ID's finding of non-infringement with respect to the '828

Patent. Apple further requests that the Commission review the ID's findings that the '607 and

'430 patents are invalid. Also on January 30, 2012, Motorola filed a contingent petition for

review of certain aspects of the final ID. *See* Motorola's Pet.

On February 7, 2012, Motorola filed a response to Apple's petition for review. *See*

Motorola's Resp. Also on February 7, 2012, Apple filed a response to Motorola's contingent

petition for review. *See* Apple's Resp. Further on February 7, 2012, the IA filed a joint response to both Apple's and Motorola's petitions. *See* IA's Resp.

On February 23, Apple filed a post-RD statement on the public interest pursuant to Commission Rule 201.50(a)(4), along with a motion for leave to file the statement out of time. On February 22, 2012, non-party Google Inc. filed a public interest statement in response to the post-RD Commission Notice issued on January 25, 2012. *See* Corrected Notice of Request for Statements on the Public Interest (Jan. 25, 2012).

B.   Patents at Issue

This investigation pertains to two, distinct technologies. The first, concerning the '607 and '828 patents, pertains to touchscreens used, in particular, with modern smartphones and tablets. The second, concerning the '430 Patent, pertains to the ability of a computer system to add new system components without requiring a separate installation program or a system reboot.

The '828 Patent is entitled "Ellipse Fitting For Multi-Touch Surfaces," and is directed to apparatus and methods for simultaneously tracking multiple finger and palm contacts as hands approach, touch, and slide across a proximity-sensing, multi-touch interface. The inventors of the '828 Patent are Wayne Westerman and John G. Elias. The patent is assigned to Apple. The '828 Patent has 35 claims, of which claims 1, 2, 10, 11, 24-26, and 29 are asserted against Motorola.

Asserted claim 1 of the '828 Patent and its asserted dependent claim 2 are directed generally to a method of processing input from a touch-sensitive surface, comprising the steps of receiving one or more proximity images representing a scan of electrodes on the touch-

sensitive surface, segmenting the proximity images into one or more pixel groups that represent the proximity of a distinguishable hand part or other touch object near the touch-sensitive surface, and mathematically fitting an ellipse to at least one of the pixel groups. Asserted claim 10 and its asserted dependent claim 11 are directed generally to a touch-sensing device comprising touch-sensing electrodes arranged on a substrate with electronic scanning hardware adapted to read the electrodes. A calibration module is coupled to the hardware and adapted to construct a proximity images having pixels corresponding to the electrodes. The claimed device also has a contact tracking and identification module which is adapted to segment the pixels into pixel groups representing the proximity of a hand part or touch object and to mathematically fit an ellipse to the pixel groups. Asserted claim 24 and its asserted dependent claim 29 are directed generally to a touch-sensing device comprising means for producing a proximity image of pixels that represent a scan of the electrodes on a touch-sensitive surface, means for segmenting the proximity image into pixel groups, which represent a touch object in proximity to the touch-sensitive surface, and means for fitting an ellipse to the pixel groups.

The '607 Patent is entitled "Multipoint Touchscreen," and is directed to a touch panel that has a transparent capacitive sensing medium configured to detect multiple touches or near touches that occur simultaneously and at different locations on the touch panel. In response to the multiple touches, the sensing medium produces distinct signals representative of the location of the touches on the touch panel. The inventors of the '607 Patent are Steve Hotelling, Joshua A. Strickon, and Brian Q. Huppi. The patent is assigned to Apple. The '607 Patent has 11 claims, of which claims 1-7 and 10 are currently asserted against Motorola.

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Asserted claim 1 of the '607 Patent and its dependent asserted claims 2-7 are directed generally to a touch panel having a transparent capacitive sensing medium configured to detect multiple, co-occurring touches and different locations on the touch panel and to product signals representative of the location of the touches, the touch panel comprising two layers of transparent electrically-isolated conductive lines where the two layers are spatially separated from each other and where the conductive lines in the one layer are positioned transverse to the conductive lines in the other layer, creating an array of intersection points. Capacitive monitoring circuitry is configured to detect changing in the capacitance between the two layers of conductive lines, indicating the location of the multiple touches on the touch panel. Asserted claim 10 of the '607 Patent is directed generally to a display arrangement comprising a display for a graphical user interface ("GUI"), a transparent touch panel having a multipoint sensing arrangement configured to recognize multiple, co-occurring touches at different locations on the touch panel by sensing a resulting change in capacitive coupling associated with the touches and of outputting this information to a host device to form a pixilated image. The touch panel has three glass plates separating two transparent conductive layers. Each conductive layer contains a plurality of spaced parallel lines having the same pitch and linewidths, and where the lines in one of the layers is perpendicular to the lines in the other layer.

The '430 Patent is entitled "Object-Oriented System Locator System," and is directed to a method and system for adding system components, *e.g.*, documents, tools, fonts, libraries, etc., to a computer system without running an installation program and without requiring a system reboot. The inventor of the '430 Patent is Frank T. Nguyen. The patent is assigned to

Taligent, Inc. of Cupertino, California. The '430 Patent has 23 claims, of which claims 1, 3, and 5 are asserted against Motorola.

The method and system of the '430 Patent are capable of interactively determining the type of system component to be added, obtaining a relevant search criteria and scope of search, and querying the system to identify resources that match the specified system search criteria. The invention of the '430 Patent uses a location framework to locate system components that have properties matching those specified in the search criteria. The system component matches are returned to enable the system to access the necessary system component. Claim 1 of the '430 Patent and its dependent asserted claims 3 and 5 are directed generally to a computer-implemented method for dynamically – that is, without rebooting the system – adding support for hardware or software components having certain properties to an operating system. The method comprises specifying search criteria pertaining to the properties of the target hardware or software component, querying the operating system to identify the corresponding hardware of software components that meet the search criteria, returning those corresponding components, and adding support for those components to the operating system without rebooting the operating system.

C. Products at Issue

The accused products are, in general, mobile devices and tablet computers with touchscreens. With respect to the '828 Patent, Apple specifically accuses Motorola's multi-touch devices, including the following models: Motorola Atrix, Bravo, Charm, Citrus, Cliq 2, Cliq XT/Quench, Defy, Droid, Droid 2, Droid 2 Global, Droid Bionic, Droid Pro, Droid X, Droid X2, Droid 3, Flipout, Flipside, il, Titanium, Xoom, and XPRT (collectively, the "Accused '828

Products"). The ALJ notes that it is uncertain whether the i1 device is still accused of infringing the '828 Patent. ID at 7, n.1.

With respect to the '607 Patent, Apple specifically accuses Motorola mobile devices that include multi-point touchscreens, including the following models: Motorola Atrix, Bravo, Charm, Citrus, Cliq 2, Defy, Droid, Droid 2, Droid 2 Global, Droid Bionic, Droid Pro, Droid X, Droid X2, Droid 3, Flipout, Flipside, Titanium, and XPRT (collectively, the "Accused '607 Products").

With respect to the '430 Patent, Apple specifically accuses Motorola mobile devices that run the Android 1.5-3.1 operating systems, including the following models: Motorola Atrix, Bravo, Charm, Citrus, Cliq, Cliq/Dext, Cliq 2, Cliq XT/Quench, Defy, Devour, Droid, Droid 2, Droid 2 Global, Droid Bionic, Droid Pro, Droid X, Droid X2, Droid 3, Flipout, Flipside, il, Titanium, Xoom (4G/LTE), Xoom (Everest), Xoom (UMTS), Xoom (Wi-Fi), and XPRT (collectively, the "Accused '430 Products").

IV. Standard of Review

The Commission may review an ID either upon petition by one of the parties or on its own motion. *See* 19 C.F.R. §§ 210.43 & 210.44. The Commission will grant a petition for review, in whole or in part, where it appears:

(i)   that a finding or conclusion of material fact is clearly erroneous;

(ii)   that a legal conclusion is erroneous, without governing precedent, rule or law, or constitutes an abuse of discretion; or

(iii)   that the determination is one affecting Commission policy.

19 C.F.R. § 210.43(b)(1) & (d)(2).

The Commission's review will encompass those issues for which at least one participating Commissioner has voted for review. *See* 19 C.F.R. § 210.43(d)(3). Any issue that is

not raised in a petition for review is deemed to have been abandoned by the petitioning party

and may be disregarded by the Commission, unless the Commission chooses to review the issue

on its own initiative. *See* 19 C.F.R. § 210.43(b)(2).

V. Analysis and Recommendation Concerning Issues That Have Been Petitioned

A. Claim Construction

Claim construction "begin[s] with and remain[s] centered on the language of the claims

themselves." *Storage Tech. Corp. v. Cisco Sys., Inc.*, 329 F.3d 823, 830 (Fed. Cir. 2003); *Phillips v.*

AWH Corp., 415 F.3d 1303, 1312 (Fed. Cir. 2005) (*en banc*). The language used in a claim bears

a "heavy presumption" that it has the ordinary and customary meaning that would be

attributed to the words used by persons skilled in the relevant art. *Phillips*, 415 F.3d at 1312-13.

To help inform the court of the ordinary meaning of the words, a court may consult the intrinsic

evidence, including the claims themselves, the specification, and the prosecution history, as

well as extrinsic evidence, such as dictionaries and treatises and inventor and expert testimony.

Id. at 1314. In particular "the specification 'is always highly relevant to the claims construction

analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.'"

Id. at 1315 (citations omitted).

A court must "take care not to import limitations into the claims from the specification."

Abbott Labs. v. Sandoz, Inc., 566 F.3d 1282, 1288 (Fed. Cir. 2009). "When the specification

describes a single embodiment to enable the invention, this court will not limit broader claim

language to that single application 'unless the patentee has demonstrated a clear intention to

limit the claim scope using "words or expressions of manifest exclusion or restriction."'" *Id*.

(citations omitted). "By the same token, the claims cannot enlarge what is patented beyond

what the inventor has described as the invention. Thus this court may reach a narrower construction, limited to the embodiment(s) disclosed in the specification, when the claims themselves, the specification, or the prosecution history clearly indicate that the invention encompasses no more than that confined structure or method." *Id*. (citations omitted).

"[T]he distinction between using the specification to interpret the meaning of a claim and importing limitations from the specification into the claim can be a difficult one to apply in practice … [h]owever, the line between construing terms and importing limitations can be discerned with reasonable certainty and predictability if the court's focus remains on understanding how a person of ordinary skill in the art would understand the claim terms." *Phillips*, 415 F.3d at 1323 (citations omitted). In attempting to discern whether a "patentee is setting out specific examples of the invention . . . or whether the patentee instead intends for the claims and the embodiments in the specification to be strictly coextensive . . . [t]he manner in which the patentee uses a term within the specification and claims usually will make the distinction apparent." *Id*.

1.   '828 Patent - "Mathematically Fit(ting) An Ellipse"

The asserted claims of the '828 Patent are claims 1, 2, 10, 11, 24-26, and 29. The ID construed the following terms found in the asserted claims:

- "mathematically fitting an ellipse"/"mathematically fit an ellipse" (claims 1 and 10, respectively);

- "ellipse parameters" (claims 2, 11, and 29);

- "means for fitting an ellipse to at least one of the pixel groups" (claim 24);

- "proximity" and "electrode" (all asserted claims);

- "a calibration module operatively coupled to the electronic scanning hardware and

adapted to construct a proximity image having a plurality of pixels corresponding to the touch-sensing electrode" (claim 10);

- "each pixel group representing proximity of a distinguishable hand part or other touch object" (claims 1 and 10);

- "contact tracking and identification module" (claim 10);

- "means for producing a proximity image representing a scan of a plurality of electrodes of a touch-sensitive surface, the proximity image having a plurality of pixels corresponding to the touch-sensing electrodes" (claim 24);

- "segmenting"/"segment" (claims 1 and 10, respectively);

- "means for segmenting the proximity image into one or more pixel groups, each pixel group representing a touch object on or near the touch-sensitive surface" (claim 24);

- "transmitting one or more ellipse parameters as a control signal to an electronic or electromechanical device"/"transmit one or more ellipse parameters as a control signal to an electronic or electromechanical device" (claims 2 and 11, respectively);

- "means for transmitting one or more ellipse parameters as a control signal to an electronic or electromechanical device" (claim 29); and

- "adapted to" (claims 10 and 11)

ID at 18-49. Apple petitions for review of the following claim element:

- "mathematically fit(ting) an ellipse"[10] (claims 1 and 10)

Apple's Pet. at 8-17. For reasons that will be explained further in our analysis below, we recommend that the Commission determine not to review the ID's construction of the claim limitation "mathematically fit(ting) an ellipse."

The currently disputed terms are highlighted in the asserted claims below:

_____

[10] For convenience, we hereinafter use the ID's method for shorthanding the claim limitations "mathematically fitting an ellipse" (claim 1) and "mathematically fit an ellipse" (claim 10) as "mathematically fit(ting) and ellipse." We also adapt the ID's shorthand of the claim limitations "mathematically fitting an ellipse to at least one of the pixel groups" (claim 1) and "mathematically fit an ellipse to at least one of the one or more pixel groups" (claim 10) as "mathematically fit(ting) an ellipse to at least one of the (one or more) pixel groups."

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Claim 1 of the '828 Patent provides:

> 1. A method of processing input from a touch-sensitive surface, the method comprising:
> receiving at least one proximity image representing a scan of a plurality of electrodes of the touch-sensitive surface;
> segmenting each proximity image into one or more pixel groups that indicate significant proximity, each pixel group representing proximity of a distinguishable hand part or other touch object on or near the touch-sensitive surface; and
> **mathematically fitting an ellipse** to at least one of the pixel groups.

Claim 2 of the '828 Patent provides:

> 2. The method of claim 1 further comprising transmitting one or more ellipse parameters as a control signal to an electronic or electromechanical device.

Claim 10 of the '828 Patent provides:

> 10. A touch-sensing device comprising:
> a substrate;
> **a plurality of touch-sensing electrodes arranged on the substrate**;
> electronic scanning hardware adapted to read the plurality of touch-sensing electrodes;
> a calibration module operatively coupled to the electronic scanning hardware and adapted to construct a proximity image having a plurality of pixels corresponding to the touch-sensing electrodes; and
> a contact tracking and identification module adapted to:
> segment the proximity image into one or more pixel groups, each pixel group representing proximity of a distinguishable hand part or other touch object on or near the touch-sensitive surface; and
> **mathematically fit an ellipse** to at least one of the one or more pixel groups.

Claim 11 of the '828 Patent provides:

> 11. The touch-sensing device of claim 10 further comprising a host communication interface adapted to transmit one or more ellipse parameters as a control signal to an electronic or electromechanical device.

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Claim 24 of the '828 Patent provides:

> 24. A touch-sensing device comprising:
> means for producing a proximity image representing a scan of a plurality of electrodes of a touch-sensitive surface, the proximity image having a plurality of pixels corresponding to the touch-sensing electrodes; and
> means for segmenting the proximity image into one or more pixel groups, each pixel group representing a touch object on or near the touch-sensitive surface; and
> means for fitting an ellipse to at least one of the pixel groups.

Claim 25 of the '828 Patent provides:

> 25. The touch-sensing device of claim 24 wherein the touch object comprises at least a portion of a hand.

Claim 26 of the '828 Patent provides:

> 26. The touch-sensing device of claim 24 wherein the touch object comprises at least a portion of one or more fingers.

Claim 29 of the '828 Patent provides:

> 29. The touch-sensing device of claim 24 further comprising means for transmitting one or more ellipse parameters as a control signal to an electronic or electromechanical device.

a)   ID

The ID construes the claim phrase "mathematically fit(ting) an ellipse" in claims 1 and 10 of the '828 Patent to require "performing a mathematical process where by an ellipse is actually fitted to the data consisting of one or more pixel groups and from that ellipse various parameters can be calculated."   ID at 30. The parties' proposed constructions of the limitation "mathematically fit(ting) an ellipse" in claims 1 and 10 were as follows:

Claim Term	Apple	Motorola and Staff
"mathematically fitting an ellipse"	comput(ing) numerical parameters	applying a unitary transformation of the

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Claim Term	Apple	Motorola and Staff
(claim 1) "mathematically fit an ellipse" (claim 10)	that mathematically define an ellipse	group covariance matrix of second moments of proximity data to fit an ellipse

Id. (emphasis added). The ALJ characterized the key dispute between the competing

constructions as whether the claim limitation "mathematically fitting an ellipse" is limited to

the methodology and equations explicitly recited in the specification of the '828 Patent. ID at

19.

Motorola and the IA argued before the ALJ that the claim limitation is limited to the

equations recited in the specification because the specification discloses that "'the ellipse-

fitting procedure *requires* a unitary transformation of the group covariance matrix G_{eov} of

second moments Q_{xx}, Q_{yy}, G_{zz}.'" ID at 19 (emphasis in original) (citing '828 Patent at 26:18-21).

Motorola also argued that the prosecution history of the '828 Patent requires its proposed

construction. ID at 20. Specifically, Motorola noted that, during prosecution, the applicants

amended claims 1 and 10, which originally contained the limitation "fit[ting] an ellipse to at

least one of the [one or more] pixel groups" to overcome a rejection based on U.S. Patent No.

5,825,352 to Bisset et al. ("Bisset '352"). *Id.* (citing JX-6 at 1407-25). The applicants disagreed

with the examiner's comparison of the method disclosed in Bisset '352 of obtaining measured

data from an ellipse-like object with the claimed method in the application of fitting an ellipse

to data. *Id.* (citing JX-6 at 1468). Nevertheless, Motorola noted, the applicants amended the

claims to recite "*mathematically* fitting an ellipse to one or more pixel groups" when the

examiner indicated that the amendment would traverse the rejection. *Id.* (citing JX-6 at 1469)

(emphasis added). Moreover, Motorola argued that Apple's proposed construction incorrectly

focuses on what parameters are computed rather than on how those parameters are computed,

noting that the same five parameters can be used to define both an ellipse and a rectangle, but

that the claims require fitting an ellipse to the data. *Id*.

Apple argued before the ALJ that its proposed construction was consistent with the

plain and ordinary meaning of the claim term, and that "'mathematically fit(ting) an ellipse' is a

process of computing numerical parameters that mathematically define an ellipse.'" ID at 20-

21. Apple contended that both parties' experts explained that the ellipse-fitting process results

in numerical parameters that describe an ellipse, *e.g.*, centroid (x and y positions), major axis,

minor axis, and orientation. ID at 21. Apple argued that limiting the construction of the

limitation to the equations recited in the specification would exclude what it terms the "second

embodiment" of ellipse fitting, which Apple asserts is described in the specification as where

"'the "total group proximity G_z" is used to indicate contact size and finger pressure and default

mathematical values are for certain ellipse parameters rather than applying a unitary

transformation of the group covariance matrix.'" ID at 21 (citing '828 Patent at 27:1-8).

Moreover, with respect to Motorola's prosecution history argument, Apple asserts that the

applicants were not distinguishing between different ways of fitting an ellipse, but rather were

distinguishing the claims from Bisset '352, which does not disclose any type of ellipse fitting,

but only the data acquisition steps that precede ellipse fitting. ID at 22.

The ALJ rejected Motorola's and the IA's proposed constructions, which limited the

limitation "mathematically fit(ting) an ellipse" to the specific embodiment recited in the

specification at column 26 of the '828 Patent specification, but also declined to apply Apple's

broader construction. ID at 23. Specifically, the ALJ found that Apple's proposed construction "would read out the requirement [as recited in the claims] that an 'ellipse' must be 'fitted' 'mathematically' to the pixel groups." *Id*. The ALJ also found that Apple's proposed construction was not supported by the specification or the prosecution history. *Id*.

With respect to the claim language, the ALJ rejected Apple's argument that its construction reflects the plain meaning of the claim language because the "'*results* of an ellipse fitting process are numerical parameters that describe an ellipse . . . ." *Id*. Rather, the ALJ found, the independent claims discuss the process of fitting an ellipse and the particular way in which the parameters that define an ellipse are calculated, *i.e.*, by mathematically fitting, but does not discuss the parameters that might result from such a process. ID at 23-24; *see also* ID at 28-29 (rejecting Apple's construction because it would reverse the claimed process of "mathematically fitting" an ellipse ***to*** a pixel group, by allowing for the calculation of a parameter "generated in any way possible that could be use *ex post* to generate an ellipse that could be fitted over the pixel groups[.]") (emphasis in original). The ALJ also credited Motorola's argument that the parameters that could be used to define an ellipse could also be used to define a rectangle or other shape. ID at 24. As such, the ALJ agreed with Motorola that "[m]erely calculating the parameters that *could* define an ellipse does not mean that the figure 'fitted' to the data is an ellipse since these same parameters can define many different geometric figures." *Id*. (emphasis added).

The ALJ also rejected Apple's reliance on the testimony of Dr. Westerman, one of the named inventors of the '828 Patent, that the methodology described in the '828 Patent at the top of column 27 – the so-called "second embodiment" – discloses an alternate method of

"mathematically fit(ting) an ellipse." ID at 29. Rather, the ALJ found that Dr. Westerman also testified, consistent with the specification, that the so-called "second embodiment" is an alternative to – not an example of – ellipse fitting." *Id.* (citing Westerman, Tr. at 339:25-340:8). The ALJ did note the deposition testimony of the other named inventor, Mr. Elias, who stated that the meaning of "to fit an ellipse . . . to a collection of data points" from "a mathematical point of view" is "find[ing] the parameters that describe that ellipse, such that it minimizes the differences between the ellipse, the model, and the data." *Id.* (citing RX-1885C (Wolfe Direct Witness Statement ("DWS") at Q/A 447 (quoting Elias Dep. Tr. at 186-87)).[11] The ALJ also noted that Mr. Elias testimony "is most consistent with the common mathematical meaning of the term 'fitting' used in a variety of similar contexts (most commonly in statistics)." ID at 29-30 (citing Merriam Webster Dictionary (definition of "curve fitting"; *ATA Airlines, Inc. v. Fed. Express Corp.*, --- F.3d --- , 2011 WL 6762865, at 8 (7th Cir. Dec. 30, 2011) ("*ATA Airlines*") (discussing line fitting using "least squares"); *Burlington N., Inc. v. United States*, 676 F.2d 566, 578 n.37 (Ct. Cl. 1982) (discussing curve fitting using "least squares")).

Based on the intrinsic evidence, the ALJ concluded that "mathematically fit(ting) an ellipse to one or more pixel groups" means "performing a mathematical process where by an ellipse is actually fitted to the data consisting of one or more pixel groups and from that ellipse various parameters can be calculated." ID at 30.[12]

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[11] The ID incorrectly cites to RX-1895C. Furthermore, the RX-1885C exhibit cites the incorrect pages of JX-705C (Elias Dep.). The correct citation is JX-705C at 192.

[12] None of the petitions for review address the ALJ's construction of the claim limitation "mathematically fit(ting) an ellipse." We, therefore, do not summarize the ALJ's discussion rejecting Motorola's and the IA's proposed construction that the claim language should be limited to the (continued…)

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b) Parties' Arguments

(1) *Apple's Petition*

Apple argues that the ID errs by adopting a construction for the claim limitation "mathematically fit(ting) an ellipse to at least one of the [one or more] pixel groups" that was not proposed by any of the parties. Apple's Pet. at 8. Apple further argues that the ID's construction is not consistent with the intrinsic evidence, specifically criticizing the language of the construction that recites "an ellipse is actually fitted" and "from that ellipse various parameters can be calculated." *Id*. at 9. Apple also argues that the ID's construction is circular in that it "fails to delineate the proper scope of 'mathematically fit(ting) an ellipse.'" *Id*. Apple contends that the specification does not disclose any process by which "an ellipse is 'actually fitted' and 'from that ellipse various parameters can be calculated,' as required by the ALJ's construction." *Id*. Rather, Apple argues, "ellipse parameters are computed in various ways, and the fitted ellipse is only defined after those parameters have been computed." *Id*.

Apple argues that the ID's construction "erroneously divorces the calculation of ellipse parameters from the process of ellipse fitting." *Id*. at 9. Specifically, Apple contends that the '828 Patent specification states that "pixel groups are '**parameterized** by fitting an ellipse to the positions and proximity measurements of the electrodes within each group.'" *Id*. (emphasis in original) (citing '828 Patent at 19:8-12). Apple also points to the data flow diagram of proximity image segmentation illustrated in Figure 18, noting in particular step 272, which is labeled "Fit Ellipse to Combined Groups." *Id*. Apple notes that step 272 results in "**parameterized**

(…continued)
embodiment specifically recited in the specification of the '828 Patent a column 26. *See* ID at 24-27.

electrode groups," at step 242 (Fig. 18), and that the specification describes step 272 as "extract[ting] shape, size, and position **parameters**." *Id*. at 9-10 (emphasis in original) (citing '828 Patent at Fig. 18; 25:54-56). Apple also points to the phrase "**fitted ellipse parameters**" in the specification. *Id*. at 10 (emphasis in original) (citing '828 Patent at 27:1-3). Apple further notes that the dependent claims refer to "transmitting one or more **ellipse parameters**" (claim 11) "without describing a separate step where these parameters are computed; the clear implication is that 'mathematically fit(ting) an ellipse' includes the computation of ellipse parameters." *Id*. (emphasis in original) (citing 60:16-18 (claim 5), 61:1-4 (claim 11)).

Apple also argues that the ID's construction of the claim limitation "mathematically fit(ting) an ellipse" excludes the preferred embodiment disclosed in the specification of the '828 Patent. *Id*. Specifically, Apple asserts that the matrix transformation operation disclosed in the specification (*see* column 26) does not, on its own fit an ellipse, but "merely facilitates the calculation of certain ellipse parameters [the major axis, minor axis, and orientation], while other ellipse parameters [the centroid] are computed without the matrix transformation." *Id*. (citing '828 Patent at 25:62-26:10, 26:36-45). Apple states that, in the preferred embodiment disclosed in the specification of the '828 Patent, the parameters that define the centroid of the ellipse (*e.g.*, G_x and G_y) "are computed separately, prior to the matrix transformation" and that "the values for these parameters are actually used to form the covariance matrix." *Id*. at 12 (citing '828 Patent at 25:65-26:10). Apple notes the testimony of one of the named inventors of the '828 Patent, Mr. Westerman, who stated that the matrix transformation operation disclosed in the specification "'just means rotating the coordinate space of that matrix.'" *Id*. at 11 (citing Westerman Tr. at 337:10-17). Moreover, Apple claims, "the specification describes

calculating parameters from the covariance matrix, not from any 'actual ellipse[.]" *Id*. (citing

'828 Patent at 26:36-37 (discussing using the calculated eigenvalues of the covariance matrix to

determine the ellipse axis lengths and orientation)).

Apple further argues that the ID's construction of the claim limitation "mathematically

fit(ting) an ellipse" is inconsistent with the ordinary meaning of ellipse fitting. *Id*. at 12. Apple

notes that its expert, Dr. Balakrishnan, testified that "'one of ordinary skill in the art would have

understood that "mathematically fit(ting) an ellipse" meant comput(ing) numerical parameters

that mathematically define an ellipse.'" *Id*. (citing CX-201C.099 (Balakrishnan DWS) at Q. 444).

Apple contends that, "[p]rior to the ALJ raising the issue, there was no dispute between the

parties whether the ordinary meaning of ellipse fitting included computing ellipse parameters."

Id. Apple criticizes the ALJ use of extrinsic evidence, including a lay dictionary and two cases,

ATA Airlines and *Burlington*, as support for determining a definition of ellipse fitting. *Id*., n. 3.

Instead, Apple states that the appropriate extrinsic support may be found in the testimony of

the other named inventor of the '828 Patent, Mr. Elias, who stated that "'to fit an ellipse, as an

example, to a collection of data points means that **you want to find the parameters** that

describe that ellipse, such that it minimized the differences between the ellipse, the model, and

the data." *Id*. at 12-13 (emphasis in original) (citing JX-705C (Elias Dep.) at 192:6-12). Apple

also characterizes the Desai Thesis, cited as prior art by Motorola, as describing mathematical

fitting in terms of computing parameters. *Id*. at 13 (citing RX-351 (Desai Thesis) at 63).

Apple argues that its proposed construction of the claim limitation "mathematically

fit(ting) an ellipse" as "comput(ing) numerical parameters that mathematically define an ellipse"

follows directly from the disclosure of the '828 Patent. *Id*. at 14. Specifically, Apple notes the

various references in the specification and the claims to the terms "parameterized" and "ellipse

parameters." *Id*. Apple further argues that the specific mathematical formulas disclosed in the

specification for computing ellipse parameters (*e.g.*, total group proximity, centroid, major axis,

minor axis, orientation, and eccentricity) "comprise an ellipse fitting procedure where the

results are numerical parameters describing the shape, size, and position of a pixel group." *Id*.

(citing '828 Patent at 25:67-26:67). Apple disputes the ALJ's characterization of its proposed

construction as eliminating limitations from the claims, arguing that its proposed construction

"requires that the computed parameters 'mathematically define an ellipse,'" as opposed to

some other shape, and that "the ellipse 'approximates the shape of at least one of the pixel

groups.'" *Id*. at 15. Apple argues that "[a]n ellipse is mathematically fitted when the computed

parameters mathematically define an ellipse." *Id*.

Lastly, Apple argues that its proposed construction of the claim limitation

"mathematically fit(ting) an ellipse" is consistent with the ordinary meaning of ellipse fitting. *Id*.

Apple asserts that both parties' experts "agreed that the ordinary meaning of 'mathematically

fit(ting) an ellipse' is a process of computing numerical parameters that mathematically define

an ellipse." *Id*. (citing CX-201C (Balakrishnan DWS) at Q. 440; CX-568C (Balakrishnan Rebuttal

Witness Statement ("RWS") at Q. 452-453; RX-1885C (Wolfe DWS) at Q. 33-50; Wolfe, Tr. at

1347:9-1349:2). Apple notes that, during the tutorial before the beginning of the evidentiary

hearing, both parties' experts explained that "the results of an ellipse fitting process are

numerical parameters that describe an ellipse, for example centroid, major axis, minor axis, and

orientation." *Id*. (citing Balakrishnan, Tr. at 43:15-44:12; CDX-10.075-076; Wolfe, Tr. at 70:23-

71:6). Apple argues that Motorola's expert, Dr. Wolfe, acknowledged that "'there are a variety

of methods of mathematically fitting an ellipse" (RX-1885C (Wolfe DWS) at Q. 50), that

"different sets of parameters may be used to define an ellipse" (RX-1885C (Wolfe DWS) at Q.

40), and that "fitting a geometric shape to data is a well-known mathematical concept" which

may be used to in the context of fitting other shapes, *e.g.*, lines (Wolfe, Tr. 1347:14-23,

1354:12-1357:13). *Id*. at 15-16.

(2)   *Motorola's Response*

Motorola asserts that the ID's construction of the claim limitation "mathematically

fit(ting) an ellipse" to mean "performing a mathematical process whereby an ellipse is actually

fitted to the data consisting of one or more pixel groups and from that ellipse various

parameters can be calculated" "is consistent with the intrinsic record of the '828 [P]atent."

Motorola's Resp. at 15. Motorola argues that, even though the ALJ rejected its proposed

construction, which would have limited the ellipse-fitting process to the covariance matrix

method disclosed in the specification, the ALJ nevertheless correctly recognized "that the

claims required computing the [ellipse] parameters *from* a model ellipse that is fitted to a pixel

group" using some mathematical function, *e.g.*, a "least squares" fit. *Id*. at 16 (emphasis in

original) (citing ID at 25-27, 29-30).

Motorola contends that the ALJ astutely noted the "litany of problems with Apple's

[proposed] construction" of the claim limitation "mathematically fit(ting) an ellipse. *Id*.

Motorola asserts that the ALJ recognized that Apple's proposed construction is overly broad

and ignores the language of the claim. *Id*. Specifically, Motorola notes the ALJ's finding that

"'[i]nstead of "mathematically fitting" an ellipse *to* the pixel groups, as a person of ordinary skill

would understand that term, Apple's [proposed] construction would reverse the process.'" *Id*.

at 16-17 (citing ID at 28). Motorola argues that the ALJ correctly found that the intrinsic

evidence discloses that "'a mathematical fitting procedure that fits an ellipse to the pixel group

must be used . . . [and] that merely calculating ellipse parameters without using a fitting

technique is insufficient.'" *Id.* at 17 (citing ID at 27).

With respect to the extrinsic evidence, Motorola argues that the testimony of both

parties' experts support the ID's construction of the claim limitation "mathematically fit(ting) an

ellipse, stating that "the process of mathematically fitting an ellipse uses an ellipse model *to*

calculate ellipse parameters" and not that "'the parameters . . . define [an] ellipse." *Id*. at 18

(emphasis in original); *see id*. at 18-20 (emphasis in original) (citing RX-1885C (Wolfe DWS) at Q.

30, 32, 42, 49; CX-568C (Balakrishnan RWS) at Q. 452; Balakrishnan, Tr. at 549:6-550:1).

Motorola further argues that the ID's construction is consistent with the testimony of one of

the named inventors of the '828 Patent, Mr. Elias, who described fitting an ellipse as "find[ing]

the parameters that describe that ellipse, such that it minimizes the differences between the

ellipse, the model, and the data." *Id*. at 20 (citing RX-1895C at Q. 447 (quoting Elias Dep. Tr. at

186-187)). Therefore, Motorola asserts, the "ALJ's construction addresses the foundational

premise behind the '828 [P]atent" which is that "unless an ellipse is mathematically fit *to* a pixel

group, the claims of the '828 [P]atent are potentially boundless in scope and have nothing to do

with modeling the shape of a contact." *Id*. at 20-21 (emphasis in original).

(3)   IA's Response

The IA asserts that, although the ALJ adopted a construction of the claim limitation

"mathematically fit(ting) an ellipse" that no party proposed, that he committed no error and his

construction is supported by the evidence. IA's Resp. at 4. The IA notes that Apple argued that

"the ALJ erred in failing to recognize that the specification discloses that 'the ellipse fitting procedure is one and the same with the calculation of ellipse parameters[,]'" and points out that Apple did not make this argument before the ALJ, "but rather [asserted] that the '*results* of an ellipse fitting process are numerical parameters that describe an ellipse[.]'" *Id*. The IA asserts that, since the argument is raised for the first time in Apple's petition for review, it does not warrant Commission review. *Id*. (citing *Hazani v. U.S. Int'l Trade Comm'n*, 126 F.3d 1473, 1476 (Fed. Cir. 1997). Moreover, the IA argues, Apple's argument is incorrect on the merits because, as the ALJ found, "collaps[ing] ellipse fitting and parameter generation into the same event" is contrary to the claim language since "it does not require a distinct ellipse-fitting step." *Id*. at 5.

c) Analysis

The ID construes the claim phrase "mathematically fit(ting) an ellipse" in claims 1 and 10 of the '828 Patent to require "performing a mathematical process where by an ellipse is actually fitted to the data consisting of one or more pixel groups and from that ellipse various parameters can be calculated." ID at 30. We acknowledge as an initial matter that the ID's claim construction is different from all of the proposed constructions. This fact alone, however, is not sufficient to support a finding of error. *See Network Commerce, Inc. v. Microsoft Corp.*, 422 F.3d 1353, 1357-58 (Fed. Cir. 2005) (affirming the district court's construction where the court did not adopt either of the proposed claim constructions).

We disagree with the IA's contention that Apple never raised the contention that "the ellipse fitting procedure is one and the same with the calculation of ellipse parameters." Apple's Pet. at 9; *see* IA's Resp. at 4. In its post-hearing brief, Apple argued that

"'mathematically fit(ting) an ellipse' is a process of computing numerical parameters that mathematically define an ellipse.'" Post-Hearing Brief of Complainant Apple Inc. (Oct. 19, 2011) (Apple's PHB") at 26. We do not believe that this argument is substantively different from Apple's current argument. Apple's assertion is that the ellipse-fitting procedure requires calculation of the ellipse parameters, and both statements capture this argument. We, therefore, do not believe that this argument is waived.

Turning to the intrinsic evidence, we agree with the ALJ that Apple's proposed construction does not give meaning to each word in the claim language. *See* ID at 23-24. As the Federal Circuit has cautioned, "[a] claim construction that gives meaning to all the terms of the claim is preferred over one that does not do so." *Merck & Co., Inc. v. Teva Pharms., Inc.*, 395 F.3d 1364, 1372 (Fed. Cir. 2005). Here, the claim limitations contain the phrase "mathematically fitted." As such, the ALJ properly took into consideration that his claim construction accounted for these terms.

We also agree with the ALJ that the claims answer the chicken-and-the-egg question of whether an ellipse must first be fitted to a pixel group, from which at least some ellipse parameters are derived, or whether ellipse parameters are first calculated that define an ellipse approximating the shape of a pixel group. Independent claims 1 and 10 both recite "mathematically fit(ting) an ellipse" without any discussion of ellipse parameters, which are recited only in the dependent claims. For example, claims 2 and 3, which depend from claim 1, recite transmitting ellipse parameters and selecting ellipse parameters from a group of parameters (position, shape, size, orientation, eccentricity, major and minor radius) that are associated with an ellipse. *See* '828 Patent at 60:16-22; *see also id.* at 61:1-4, 8-12 (claims 11

28

and 13, which depend from claim 10). The language of claims 2 and 3 presume that the ellipse parameters are determined, at least partially, only after the ellipse fitting procedure has occurred. Even unasserted claim 5, which claims the preferred embodiment – a unitary transformation of a group covariance matrix – disclosed in the '828 Patent specification at column 26, is consistent with this interpretation. Claim 5 recites "wherein fitting an ellipse to a group of pixels comprises computing one or more eigenvalues and one or more eigenvectors of a covariance matrix associated with the pixel group." '828 Patent at 60:26-29. The specification makes clear that the eigenvalues and eigenvectors are not, themselves, the ellipse parameters, but are derived from the transformed covariance matrix G_{cov} and then are used to determine the ellipse axis lengths and orientation. *Id*. at 26:18-45. Therefore, even in this claim, the ellipse fitting occurs separately from deriving the ellipse parameters.

The remainder of the '828 Patent specification further supports the ID's construction of "mathematically fit(ting) an ellipse." For example, Figure 16 illustrates "the data flow within the contact tracking and identification module **10**," which is responsible for "segment[ing] the image into distinguishable hand-surface contacts, [and] track[ing] and identif[ying] them as they move through successive images." *Id*. at Figure 1, Figure 16, 13:16-18. An "image segmentation process **241**" in the "contact tracking and identification module **10**" "outputs a set of electrode group data structures **242**[,] which are *parameterized by fitting an ellipse*[.]" *Id*. at 19:8-10, Fig. 16 (emphasis added). Figure 18, which illustrates "the data flow within the proximity image segmentation process **241**" in detail, shows that the "parameterized electrode groups **242**" are derived from the process of "fit[ting] ellipses to combined groups" at step **272**. *Id*. at Fig. 18, 23:8-9.

The specification further discloses that "the last step **272** of the segmentation process [**241**] is to extract shape, size and position parameters from each electrode group." *Id*. at 25:54-56. At first glance, it would appear that this statement supports Apple's contention that the ellipse-fitting process consists of computing ellipse parameters. However, as Apple itself notes (Apple's Pet. at 12), in the preferred embodiment, at least two ellipse parameters (the x and y positions of the centroid) are derived before what the specification refers to as the preferred "ellipse fitting procedure" occurs. *See id*. at 25:65-26:10.[13] This fact is merely an indication that the mathematical ellipse-fitting process is distinct from the procedure of deriving or calculating ellipse parameters, and thus, that the two concepts are not co-extensive. The language of independent claims 1 and 10, which recite the step of "mathematically fit(ting) an ellipse," do not recite anything about ellipse parameters, let alone require that all of the ellipse parameters must be derived from the mathematical fitting process. While Apple argues that, because the dependent claims refer to ellipse parameters "without describing a separate step where these parameters are computed . . . 'mathematically fit(ting) an ellipse' [must] include[] the computation of ellipse parameters" (Apple's Pet. at 10), the specification belies this interpretation.

The reference cited by Motorola as prior art, the Desai Thesis, supports the conclusion that mathematical fitting is a distinct process from computing ellipse parameters. The Desai Thesis states that:

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[13] Apple argues that the disclosed unitary matrix transformation at column 26 of the '828 Patent specification "does not, on its own, fit an ellipse" but "merely facilitates the calculation of certain ellipse parameters[.]" Apple's at 10. One of the named inventors, Dr. Elias, however, testified that "applying a unitary transformation of a group covariance matrix of second moments" is "a computationally efficient way . . . of *fitting an ellipse*." JX-707C (Elias Dep.) at 197:3-9 (emphasis added).

> **The least squares algorithm uses a set of input point[s] and fits the "best" circle that passes through these points**. The term "best" is in the least squares sense. The input to the algorithms is the Cartesian co-ordinates of the points obtained after finding the boundary. **The output of the algorithm describes the centroids and the radius of the object**.

RX-351 (Desai Thesis) at 63 (emphasis added). Although Apple argues (Apple's Pet. at 13) that this language "describes mathematical fitting in terms of computing parameters," it is apparent from this passage that the "fitting" procedure is described as the "least squares algorithm" and that the output of the fitting procedure is the centroid and object radius. Contrary to Apple's contention, the Desai Thesis distinguishes the operation – "fitting" – from the output of the operation – "centroids and the radius of the object" – rather than conflating the two concepts.

The prosecution history of the '828 Patent further supports the ID's construction of "mathematically fit(ting) an ellipse." As the ALJ noted, during prosecution, the applicants argued that Bisset '352, the prior art applied by the PTO examiner in rejecting their claims, merely discloses "a series of capacitance values measured when a finger contacts a touchpad." JX-6 at 1468. The applicants distinguished Bisset '352 from the language of claim 1, which originally recited "fitting an ellipse to at least one of the pixel groups[,]" arguing that this process was different from "merely *obtaining* measured data[.]" *Id*. (emphasis in original). Motorola's expert, Dr. Wolfe, testified that even the original claim language, without the addition of the term "mathematically," distinguished the claimed invention from Bisset, stating:

> [E]ven without any remarks and without any amendment adding the limiting term "mathematically," one skilled in the art would not interpret "fitting an ellipse to at least one of the pixel groups" to include "obtaining measured data" from an ellipse-like contact such as a finger. A person of ordinary skill in the art would understand that the language "fitting an ellipse to at least one of the pixel groups," without any further clarification or

> modification, would require that some kind of parameterized
> model ellipse be constructed corresponding to the shape of a
> pixel group, not simply that some kind of value relating to, e.g.,
> width or pressure be *directly measured* from the pixels in that
> pixel group.

RX-1885C (Wolfe DWS) at Q. 447.

Apple argues that the ID's construction of "mathematically fit(ting) an ellipse" is circular and "fails to provide any meaningful criteria for determining whether an accused mathematically process includes an ellipse that is 'actually fitted.'" Apple's Pet. at 13. The evidence shows, however, that one of ordinary skill in the art would understand what is meant by "actually fitting" an ellipse to pixel data. For instance, both parties' experts, however, testified that there are multiple ways of "mathematically fitting an ellipse." *See* CX-201C (Balakrishnan DWS) at Q. 448 ("The specific mathematical formulas disclosed in the specification . . . are only one example of ellipse fit(ting)."); RX-1885C (Wolfe DWS) at Q. 50 ("[T]here are a variety of methods of mathematically fitting an ellipse. All require sophisticated mathematical transformations."). Moreover, one of the named inventors, Dr. Elias, testified that "from a mathematical point of view . . . to fit an ellipse . . . to a collection of data points means that you want to find the parameters that describe that ellipse, such that it minimizes the differences between the ellipse – the model – and the data." JX-707 (Elias Dep.) at 192:6-12. Dr. Elias then went on to elaborate by way of example, as follows:

> So you have a model . . . in this case an ellipse, that is described by
> a certain number of parameters. And you want that model to
> represent data that you've measured. In this case [] proximity
> image data. And so you fit the ellipse to the spatial arrangement
> that you have measured . . . until you have come up with a fit that
> you're satisfied with. . . . [In another example] [i]f your model is a
> straight line, and now you're trying to find the best fit of data to
> that line. And so you perform a least squares fit to that, to

minimize the differences and you come up with a slope and an intercept . . . . It's exactly analogous to that."

Id. at 195:23-196:20.

As is apparent from the intrinsic evidence and the extrinsic evidence, "mathematically fit(ting) an ellipse" does not consist of merely "calculating ellipse parameters" but of performing some sort of mathematical computation by which an ellipse model is "fitted" to the pixel group data. *See* RX-1885C (Wolfe DWS) at Q. 49 ("In order for parameters of a model ellipse to be an accurate and useful representation of the underlying data, what is required is some kind of mathematical optimization model or transform that selects and/or calculates the best five parameter values corresponding to a mathematical definition of an ellipse and the underlying data."). Based on the above discussion, we recommend that the Commission determine not to review the ID's construction of "mathematically fit(ting) an ellipse to at least one of [the one or more] pixel groups" as "performing a mathematical process whereby an ellipse is actually fitted to the data consisting of one or more pixel groups and from that ellipse various parameters can be calculated."

2. '430 Patent - "specifying a target hardware or software component search criteria including one or more properties"

The asserted claims of the '430 Patent are claims 1, 3, and 5. The ID construed the following terms:

- "dynamically adding support for hardware or software components with one or more properties" (claim 1);

- "component" (claims 1, 3, and 5);

- "specifying a target hardware or software component search criteria including one or more properties" (claim 1)'

- "returning hardware or software components meeting the target hardware or

software component search criteria" (claim 1); and

- "adding support for the hardware and software components to the operating system" (claim 1)

ID at 53-73. Apple petition for review of the following claim element:

- "specifying a target hardware or software component search criteria including one or more properties" (claim 1)

 Apple's Pet. at 63-71. For reasons that will be explained further in our analysis below, we

recommend that the Commission determine not to review the ID's construction of the claim

limitation "specifying a target hardware or software component search criteria including one or

more properties." The currently disputed terms are highlighted in the asserted claims below:

Claim 1 of the '430 Patent provides:

> **Claim 1.**
> A computer implemented method for dynamically adding support for hardware or software components with one or more properties to an operating system active on a computer with a memory, comprising the steps of:
>
> a. specifying a target hardware or software component search criteria including one or more properties;
> b. querying the operating system to identify one or more hardware or software components that meet the target hardware or software component search criteria;
> c. returning hardware or software components meeting the target hardware or software component search criteria; and
> d. adding support for the hardware and software components to the operating system without rebooting the operating system.

Claim 3 of the '430 Patent provides:

> **Claim 3.**
> A method as recited in claim 1, wherein the hardware or software components include system components.

Claim 5 of the '430 Patent provides:

> **Claim 5.**
> A method as recited in claim 1, wherein the software

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components include application components.

        a)   **ID**

The ID construes the claim phrase "specifying a target hardware or software component search criteria including one or more properties" in claim 1 of the '430 Patent as having its plain and ordinary meaning. ID at 65. The parties' proposed constructions of the claim limitation "specifying a target hardware or software component search criteria including one or more properties" in claim 1 were as follows:

Table 1. "Specifying a target hardware or software component search criteria including one or more properties."

Apple	Motorola	Staff
Specifying desired attributes that are potentially shared by one or more hardware or software components	Plain and ordinary meaning	Plain and ordinary meaning

ID at 60.

The ALJ characterized the key dispute between the parties as regarding the term "properties." *Id*. The ALJ contended that Apple's proposed construction "hides" its intention to draw a distinction "between what Apple calls 'intrinsic' or 'inherent' parts of a component and 'non-intrinsic' or 'non-inherent' parts." *Id*. Specifically, the ALJ noted that, in its post-hearing brief, Apple "clarif[ied] that the term 'properties' means 'desired attributes that are attached to components rather than being intrinsic parts of the components before use in the framework.'" *Id*. Apple argued, for example, that characteristics such as file names and sizes are "'intrinsic' parts of a component and cannot be a 'property.'" ID at 60-61. Apple noted that the preamble of claim 1 "specifies that the components must have one or more properties and that properties are a narrower subset of the search criteria." ID at 61. Apple argued that Motorola's proposed construction failed to "distinguish between components with properties

and those without properties," but that "this difference is captured by the claims using different terms for 'search criteria' and 'properties.'" *Id*. Motorola and the IA rebutted Apple's argument, arguing that "'[t]he term "search criteria" is much broader than "properties" and a user can specify search criteria that are not properties of the target hardware of software components[,]'" for example, Boolean operators or location limitations *Id*.

Apple also asserted before the ALJ that the '430 Patent specification supports its proposed construction. ID at 61-62. Specifically, Apple argued that the '430 Patent specification discloses "'attaching' or 'associating' properties with every component in the system" and that these properties serve as "a second layer of searchability for components[.]" *Id*. (citing '430 Patent at 5:66-68). Apple also argued that the preferred embodiment, as disclosed in Figures 9-11 and the associated portion of the specification, discloses "'requests being made to locate components with "desired attributes," which are "system defined attributes" attached to components by the system.'" *Id*. (citing '430 Patent at 13:2-7, 11-15, 21-24).

Apple further argued that the PTO recognized the difference between the "property search" function recited in the claims and "the known searches for intrinsic characteristics, like names and file sizes[.]" ID at 63-64. Apple also relied on the testimony of the named inventor, Frank Nguyen, who testified regarding the distinction between an "intrinsic" characteristic, such as a file name, "which is inseparable from the file" and an "additional property that a system or user define[s] and attach[es] to the file." ID at 64 (citing JX-469C (Nguyen dep.) at 21:9-21; 57:6-59:19).

The ID adopts Motorola's and the IA's proposed construction of the claim limitation

"specifying a target hardware or software component search criteria including one or more properties" as having its plain and ordinary meaning. ID at 65. The ALJ found that Motorola's and the IA's construction does not render the term "properties" superfluous. ID at 61. The ALJ also found that "Motorola's argument that 'search criteria' is broader than 'properties' is supported by the ['430 Patent] specification." *Id*. (citing '430 Patent at 9:30-40). The ALJ further found that the language of claim 1 does not support Apple's proposed construction because "[t]he claims do not distinguish between 'intrinsic characteristics' and properties[.]" *Id*.

The ALJ also found that the specification does not support Apple's proposed construction because the '430 Patent does not disclose either the words "inherent" and "non-inherent" or the words "intrinsic" and "non-intrinsic." ID at 62. In addition, the ALJ agreed with Motorola that the "specification uses [the term] properties broadly[,]" noting that the specification discloses that "[e]very component has some set of properties which ***identify*** it." *Id*. (emphasis in original) (citing '430 Patent at 5:67-68). The ALJ also rejected Apple's "efforts to cobble together the three preferred embodiments in columns 12 and 13 [of the '430 Patent specification] [to] support its construction[.]" ID at 62-63 (citing '430 Patent at 13:2-4, 4-7). Rather, the ALJ found, the specification discloses a "smart folder" embodiment, which describes a "smart folder" that can "request[] particular documents containing the desired attribute to be collected in the folder[,]" as well as "instruct[ing] the locator to notify it when new documents containing the desired attributes are added or removed from the system." ID at 63. The ALJ contrasted this embodiment to the other disclosed embodiments – the "place" and the "Parts Bin" embodiments – in which the system attaches 'system-defined attributes' to the files or devices to be placed in the place or 'Parts Bin.'" *Id*. (citing '430 Patent at 13:8-30). As such, the

ALJ found, the '430 Patent specification does not support Apple's argument that "'desired attributes" or properties are limited only to 'non-intrinsic' properties or attributes[.]" *Id*.

The ALJ also rejected Apple's reliance on the prosecution history, finding that "there are no statements or actions in the prosecution history to which Apple can point" and that Apple's reliance "on the examiner's failure to reject the claims as evidence that the examiner read the claims as Apple now seeks to do" fails. ID at 63-64. With respect to the named inventor's testimony, the ALJ "did not find this testimony persuasive in light of the complete lack of support for Apple's construction in the intrinsic evidence." ID at 64.

Lastly, the ALJ declined to adjust the construction of the claim limitation "specifying a target hardware or software component search criteria including one or more properties" to "preserve [its] validity" as both Apple and Motorola argued was appropriate. ID at 64-65. Specifically, Apple argues that Motorola was attempting to "impermissibly broaden the claims to invalidate them" and Motorola argued that "Apple's construction would leave the claims vague and indefinite." *Id*. The ALJ rejected both arguments, finding that "[t]he claim language is broad but clear" and that "the specification and prosecution history do not support Apple's construction." ID at 65.

B. Infringement - '828 Patent

The unfair acts covered under Section 337 include "all forms of infringement, including direct, contributory, and induced infringement." *Certain Home Vacuum Packaging Machines*, Inv. No. 337-TA-496, Order No. 44, 2004 ITC LEXIS 202 * 2, n.2 (Mar. 3, 2004). To establish infringement, there must be a preponderance of evidence. *See Kao Corp. v. Unilever United States, Inc.*, 441 F.3d 963 (Fed. Cir. 2006). A determination of patent infringement

encompasses a two-step analysis. *Advanced Cardiovascular Sys., Inc. v. Scimed Life Sys., Inc.*,

261 F.3d 1329, 1336 (Fed. Cir. 2001) ("*Scimed*"). First, the court determines the scope and

meaning of the patent claims asserted, and then the properly construed claims are compared

to the allegedly infringing device. *Id.* "Literal infringement of a claim exists when each of the

claim limitations reads on, or in other words is found in, the accused device." *Allen Eng. Corp. v.*

Bartell Indus., 299 F.3d 1336, 1345 (Fed. Cir. 2002).

In order to determine whether an accused structure literally meets a 35 U.S.C. § 112, ¶ 6

means-plus-function limitation, the accused structure must either be the same as the disclosed

structure or be a 35 U.S.C. §112, ¶ 6 "equivalent," *i.e.*, (1) perform the identical function and (2)

be insubstantially different with respect to structure. Two structures may be "equivalent" for

purposes of 35 U.S.C. § 112, ¶ 6 if they perform the identical function, in substantially the same

way, with substantially the same result. *Kemco Sales, Inc. v. Control Papers Co.*, 208 F.3d 1352,

1364 (Fed. Cir. 2000) (internal citations omitted). Once identity of function has been

established, the test for infringement is whether the structure of the accused product performs

in substantially the same way to achieve substantially the same result as the structure disclosed

in the specification. *Minks v. Polaris Industries, Inc.*, 546 F.3d 1364, 1379 (Fed. Cir. 2008).

However, if an accused structure is not a 35 U.S.C. §112, ¶ 6 equivalent of the disclosed

structure because it does not perform the identical function of that disclosed structure, it may

still be an "equivalent" under DOE. Applying the traditional function-way-result test, the

accused structure must perform substantially the same function, in substantially the same way,

to achieve substantially the same result, as the disclosed structure. A key feature that

distinguishes "equivalents" under 35 U .S.C. § 112, ¶ 6 and "equivalents" under DOE is that

equivalents under 35 U.S.C. § 112, ¶ 6 must perform the identical function of the disclosed structure, while equivalents under DOE need only perform a substantially similar function. *Kemco Sales*, 208 F.3d at 1364 (internal citations omitted). Furthermore, a structure failing to meet either the "way" and/or "result" prong under the 35 U.S.C. § 112, ¶ 6 test must fail DOE test for the same reason(s). *Id.*

Under DOE, "a product or process that does not literally infringe upon the express terms of a patent claim may nonetheless be found to infringe if there is equivalence between the elements of the accused product or process and the claimed elements of the patented invention." *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 21 (1997). Equivalency may be determined using the "triple identity test" and thus "focusing on the function served by a particular claim element, the way that element serves that function, and the result . . . obtained by that element. . . ." *Id.* at 39. Regardless of the linguistic framework of the test used, the "essential inquiry" is: "[d]oes the accused product or process contain elements identical or equivalent to each claimed element of the patented invention?" *Id.* at 40.

Direct infringement includes the making, using, selling, offering for sale and importing into the United States an infringing product, without authority. 35 U.S.C. § 271(a). To prove direct infringement, the plaintiff must establish by a preponderance of the evidence that one or more claims of the patent read on the accused device either literally or under DOE. *Scimed*, 261 F.3d at 1336.

Prosecution history estoppel may bar the patentee from asserting equivalents if the scope of the claims has been narrowed by amendment during prosecution. A narrowing amendment may occur when either a preexisting claim limitation is narrowed by amendment,

or a new claim limitation is added by amendment. These decisions make no distinction between the narrowing of a preexisting limitation and the addition of a new limitation. Either amendment will give rise to a presumptive estoppel if made for a reason related to patentability. *Honeywell Int'l Inc. v. Hamilton Sundstrand Corp.*, 370 F.3d 1131, 1139-41 (Fed. Cir. 2004), *cert. denied*, 545 U.S. 1127 (2005) (citing *Warner-Jenkinson*, 520 U.S. at 22, 33-34; and *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 733-34, 741 (2002)). The presumption of estoppel may be rebutted if the patentee can demonstrate that: (1) the alleged equivalent would have been unforeseeable at the time the narrowing amendment was made; (2) the rationale underlying the narrowing amendment bore no more than a tangential relation to the equivalent at issue; or (3) there was some other reason suggesting that the patentee could not reasonably have been expected to have described the alleged equivalent. *Honeywell*, 370 F.3d at 1140 (citing, *inter alia*, *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 344 F.3d 1359 (Fed. Cir. 2003) (*en banc*)). "Generalized testimony as to the overall similarity between the claims and the accused infringer's product or process will not suffice [to prove infringement under DOE]." *Texas Instruments, Inc. v. Cypress Semiconductor Corp.*, 90 F.3d 1558, 1567 (Fed. Cir. 1996).

1. ID

The ID finds that the Accused '828 Products do not infringe the asserted claims of the '828 Patent either literally or under DOE. ID at 78-107. The ALJ noted that each of the Accused '828 Products contains an integrated circuit supplied by Atmel Corporation ("the Atmel chip") for processing touch data and that the parties mostly agree as to how the accused products function. ID at 78. The ALJ characterized the primary dispute between the parties with respect

to infringement of the '828 Patent as whether the Accused '828 Products meet the

"mathematically fit(ting) an ellipse" limitation, which is found in asserted claims 1 and 10. *Id*.

The following is a brief summary of the undisputed understanding of how the Accused

'828 Products function. An Atmel chip in the accused devices reads electrical signals from the

touchscreen of the accused Motorola handheld devices and converts them into a digital

representation of charge coupling, or capacitance, values at various x-y locations in the plane of

the touchscreen called "channels." ID at 78-79. The charge coupling value is determined by

measuring the capacitance changes at the intersections formed between the horizontal "X"

electrodes, or "lines," and the vertical "Y" lines. ID at 79. The digital representation may be

conceptualized as a "map" of the touchscreen with magnitude values for each x-y channel,

which represent values proportional to charge coupling measured at the x-y intersection

locations across the touchscreen, as shown in the example below:

o	o	o	o	o	o	o	o	o	o
o	2	o	o	o	o	o	o	o	o
o	o	o	o	1	3	4	o	o	1
o	o	2	1	2	5	8	5	o	o
o	o	o	o	4	8	9	7	o	o
o	o	o	o	o	6	7	3	o	1
o	o	o	o	o	o	o	1	o	o
o	1	o	o	o	o	o	1	o	o
o	o	o	1	o	o	o	1	o	o
2	o	o	o	o	1	o	o	o	o
o	o	o	o	o	o	o	o	o	o
o	o	2	o	o	o	o	o	o	o

Id. (citing RX-1895C (Wolfe RWS) at Q/A 76 at Fig. WB9). After assembling the array of data as

seen above, the Atmel chip filters out noise and looks for touches using so-called "search

algorithms," which look for significant values that are clustered together in groups, the result of

which is shown in the examples below:

Test Template for EDIS

X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	4	X	X	X
X	X	X	X	X	5	7	5	7	7
X	X	1	X	X	4	4	7	7	7
X	X	2	1	X	8	4	7	5	5
X	X	8	X	X	X	X	X	X	X
X	X	3	6	X	X	X	X	X	X
X	X	1	X	X	X	X	X	X	X
X	X	1	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X

X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	7	5	X	X
X	X	4	X	X	X	8	6	4	X
X	5	6	13	X	X	6	5	4	X
4	5	6	4	4	X	4	4	4	X
X	4	4	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X

ID at 79-80 (citing RDX-11.32C (left-most box); RDX-11.33C (right-most box)).

Once the Atmel chip has identified the touches, it performs further processing to generate "message data" – which comprises the values XPOSMSB, YPOSMSB, TCHAREA, TCHAMPLITUDE, and (for one of the accused products) TCHVECTOR – which provides specific information about each touch to other portions of the accused device. ID at 80. Specifically, in the Accused '828 Products, the Atmel chip sends the message data to Motorola firmware and then to the Android platform to enable the device to perform particular functions in response to input from the touchscreen (*e.g.*, keyboard input, swipe, pinch-to-zoom, etc.). *Id*. As is undisputed by the parties, the values XPOSMSB and YPOSMSB represent the X and Y position, respectively, of the center of the touch on the touchscreen. ID at 81. The value TCHAREA represents a count of the number of channels affected by the touch. *Id*. The value TCHAMPLITUDE, which represents the pressure of proximity of the touch, is calculated by finding the activated channel with the highest value and adding the values of that channel and its immediate eight neighbors (*i.e.*, the values in the eight adjacent matrix positions). *Id*. Lastly, in one of the accused products, the Atmel chip calculates the value TCHVECTOR, which represents the orientation and eccentricity of the shape of a touch. ID at 81-82.

2.   Literal Infringement

a)   Doctrine of Equivalents

The ID finds that none of the Accused '828 products infringe the asserted claims of the

'828 Patent under DOE because they do not satisfy the claim limitation "mathematically fit(ting)

an ellipse" as recited in claims 1 and 10. ID at 103-105.[14] With respect to the other Accused

'828 Products, Apple argued before the ALJ that these products infringe under DOE under any

of the proposed constructions. ID at 101-102. Specifically, Apple argued that the so-called

"second embodiment" disclosed in column 27 of the '828 Patent specification "'explicitly

describes [the process of computing numerical parameters that mathematically define an

ellipse in conjunction with default values for other ellipse parameters] as equivalent to ellipse

fitting.'" ID at 101 (citing '828 Patent at 27:1-8; CX-201C (Balakrishnan DWS) at Q. 535).

Apple further argued that its claims under DOE are not barred by prosecution history

estoppel. ID at 102. Rather, Apple contended, any amendments the application made to the

claims in light of the examiner's rejections over Bisset '352, including adding the term

"mathematically" to the original claim limitation "fitting an ellipse" "were merely 'tangential'

and therefore did not limit the scope of equivalents in this case." *Id*. Apple asserted that the

applicants added "mathematically" to the language of claims 1 and 10 not to "distinguish

'mathematically fit(ting) an ellipse' from other methods of fitting an ellipse[,]" but merely to

explain that "*obtaining* measured data is [not] the same as *fitting an ellipse to* the data[.]" *Id*.

(emphasis in original) (citing CX-568 (Balakrishnan RWS) at Q. 468); *see* JX-6 1468-71. Apple

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[14] Apple argued that the Motorola Xoom (non-test) build would infringe under Motorola's and the IA's construction of "mathematically fit(ting) an ellipse" under DOE. ID at 101. Because no party is continuing to argue that the Commission adopt this construction, which limits the ellipse-fitting process to the equations recited in the '828 Patent specification (*see* col. 26), we will not discuss this issue.

further asserted that the amendment was intended only to distinguish "'the ellipse fitting step

from the data acquisition steps that precede ellipse fitting.'" *Id*. As such, Apple argued, "'[t]his

distinction is tangential to the equivalents accused by Apple, where different mathematical

processes are used to compute the same centroid, major axis, minor axis, and orientation

parameters that mathematically define an ellipse.'" *Id*.

Motorola argued before the ALJ that "the accused functionalities in the Accused '828

Products – calculating XPOSMSB, YPOSMSB, TCHAREA, TCHAMPLLITUDE, and [for the Xoom

(non-test build)] TCHVECTOR – have nothing [] to do with fitting a model ellipse" since they "do

not correspond to the position, size, shape, or orientation of any model shape that is fit to a

pixel group." ID at 103 (citing RX-1895C (Wolfe RWS) at Q. 298; RX-1879C (Simmons WS) at Q.

20-21). Motorola further argues that the Android operation system framework also does not

perform any ellipse-fitting procedure since it "does not even have access to pixel data." *Id*.

(citing Brown, Tr. 1045:22-1046:10).

The ID finds that Apple has failed to show infringement under DOE for any of the

Accused '828 Products. ID at 103-104. Referring to the other Accused '828 Products (excluding

the Xoom (non-test build)), the ALJ found that these products "do not in any way fit an ellipse

to pixel data" but rather "merely measure pressure, area, and location of the touch." ID at 104

(citing RX-1895C (Wolfe RWS) at Q. 302). The ALJ found that "Apple has made no showing that

this is equivalent to 'mathematically fit(ting) an ellipse.'" *Id*. The ALJ found that the other

Accused '828 Products "simply do not function in the same way as required by the claims[,]"

and that "[t]here is simply no link between the way the device is to function under the asserted

claims – mathematically fitting an ellipse – and the calculations that are performed in the [other

Accused '828 Products]." *Id*.

As for the Motorola Xoom (non-test build) device, which includes the TCHVECTOR value, the ALJ found that even with the calculation of TCHVECTOR, the Xoom (non-test build) "still do[es] not mathematically fit [an] ellipse to the pixel group." ID at 104-105. The ALJ found that "while it is a much closer case," Apple failed to present sufficient evidence to show infringement under DOE. ID at 105. Specifically, the ALJ noted that Apple's expert, Dr. Balakrishnan, provide only a sentence's worth of testimony on the issue, which the ALJ found to be inadequate. *Id*.

With respect to prosecution history estoppel, the ID finds that Apple's equivalents arguments are barred in any case. *Id*. Motorola argued before the ALJ "that Apple is estopped from asserting [DOE]" because the limiting amendments to claims 1 and 10 during prosecution of the application leading to the '828 Patent "created a presumption of prosecution history estoppel with respect to the ellipse-fitting limitations of these claims, and Apple has not rebutted this presumption." ID at 105-106. Motorola further argued that the applicants "remarks to the PTO regarding the scope of the ellipse-fitting limitations of claims 1, 10, and 24 created argument estoppel for these limitations." ID at 106. Specifically, Motorola argued that the amendment adding the limitation "mathematically" to the language of claims 1 and 10 "would be understood by a person of ordinary skill in the art to narrow the subject matter of [those claims]" and that the amendment, therefore, "created a presumption of prosecution history estoppel and the presumptive surrender of *all* equivalents with respect to the narrowed limitations." *Id*. (emphasis in original) (citing *Honeywell*, 370 F.3d at 1141-44).

The ALJ found that Motorola showed that Apple's equivalents arguments are barred by

prosecution history estoppel. *Id*. The ALJ noted that Apple could rebut the presumption of

prosecution history estoppel that arises from its having amended the claims of the '828 Patent

during prosecution by showing one of the following:

> [1] that the alleged equivalent would have been unforeseeable at the
> time of the narrowing amendment,

> [2] that the rationale underlying the narrowing amendment bore no
> more than a tangential relation to the equivalent in question, or

> [3] that there was some other reason suggesting that the patentee
> could not reasonably have been expected to have described the
> alleged equivalent.

Id. (citing *Honeywell*, 370 F.3d at 1144). The ALJ further noted that it is Apple's burden to rebut

the presumption of surrender of equivalents, but found that Apple failed to do so. ID at 106-

107. The ALJ pointed to the testimony of Motorola's expert, Dr. Wolfe, who explained in his

rebuttal witness statement:

> none of these three factors is present with respect to the December
> 24, 2009 Office Action rejecting each asserted claim of the '828
> Patent based on Bisset '352, or the February 24, 2010 Amendments
> and Remarks responsive to this Office Action. In particular, Bisset
> '352 not only bears more than a "tangential" relationship to the
> equivalent sought to be claimed by Apple— Motorola's calculating of
> XPOSMSB, YPOSMSB, TCHAREA, TCHAMPLITUDE and, optionally
> TCHVECTOR values—Bisset '352 actually discloses calculating near-
> identical values.

ID at 107 (citing RX-1895C (Wolfe RWS) at Q. 297, 302).

The ALJ rejected Apple's argument that the claim amendments were "merely tangential

to the equivalents in question" because "the prior art references [] failed to disclose any ellipse

model[.]" *Id*. Rather, the ALJ found that "[t]he examiner rejected the claims in light of Bisset

'352 because the prior art taught fitting an ellipse to one or more pixel groups" and that "the

applicants . . . amended the claims to recite that the 'fitting' was done mathematically." *Id*.

The ALJ found that "the equivalents at issue here go the heart of this amendment – the way in

which the fitting is performed – and therefore the presumption of surrender under *Festo*

applies." As such, the ALJ found that the Accused '828 Products do not infringe under DOE. *Id*.

3. Parties' Arguments

4. Analysis

The ID finds that none of the Accused '828 Products, including the Motorola Xoom (non-

test build), the Motorola Xoom (test build), or the Motorola Handset Products, infringe the

asserted claims of the '828 Patent literally or under DOE, in particular, the claim limitation

"mathematically fit(ting) an ellipse to at least one of the (one or more) pixel groups." ID at 93,

99, 105. The ID further finds that Apple's assertions under DOE are barred by prosecution

history estoppel. *Id*. at 105-107.

a) Claims 1 and 10

(1) *Literal Infringement*

(2) *Doctrine of Equivalents*

(3) *Claims 24-26, and 29*

As Apple notes, the ID does not explicitly address the issue of infringement with respect

to the means-plus-function claims 24-26 and 29. We do not agree with the IA that the mere

recitation of those claims in the ID's summary "Initial Determination and Order" (ID at 205) is

sufficient to satisfy the ALJ's obligations under the Commission's rules. *See* 19 C.F.R. § 210.42(d)

("The initial determination shall include: an opinion stating findings . . . and conclusions and the

reasons of bases therefor necessary for the disposition of *all material issues of fact, law or*

discretion presented in the record[.]") (emphasis added). That being said, we believe that the

ALJ's analysis of the claim limitation "mathematically fit(ting) an ellipse" with respect to claims

1 and 10 of the '828 Patent is dispositive of the issue of infringement for claims 24-26, and 29.

As both Motorola (Motorola's Resp. at 37-39) and the IA (IA's Resp. at 11-12) note, Apple never presented any argument or evidence concerning the literal infringement of the limitation "means for fitting an ellipse to at least one of the pixel groups" in claim 24 of the '828 Patent separate from its infringement arguments concerning claims 1 and 10. *See* Apple's PHB at 72 (discussing infringement of claim 24 "in the context of claims 1 and 10[.]"). Neither did Apple's expert's, Dr. Balakrishnan's, opinion on the literal infringement of claim 24 go beyond his analysis with respect to claims 1 and 10. *See* CX-201C (Balakrishnan DWS) at Q. 576 ("As I explained in the context of claims 1 and 10 … the Atmel Protocol Guides describe numerical parameters that are computed for each multitouch object corresponding to a pixel groups, which are parameters that mathematically define an ellipse."). As for DOE, Dr. Balakrishnan merely testified as follows:

> To the extent that the Accused Products do not infringe this limitation [of claim 24] literally, they infringe under [DOE], because calculating area, amplitude, orientation, and eccentricity parameters, or calculating position, area, and amplitude parameters, is performing the same function of characterizing the position, shape, and size of a contact, in the same way by using mathematical computations, with the same result of numerical parameters that mathematically define an ellipse.

Id. at Q. 578. If the Commission were to remand this issue to the ALJ, we believe it is unlikely that he would find this testimony any more adequate to prove infringement under DOE than the testimony he rejected concerning Dr. Balakrishnan's DOE analysis regarding claims 1 and 10. In our view, this testimony is inadequate to establish infringement under DOE.

In its petition for review, Apple attempts to present argument connecting the various message data parameters – XPOSMSB, YPOSMSB, TCHAREA, TCHAMPLITUDE, and TCHVECTOR

– to the equations recited in column 25 of the '828 Patent specification, which the ALJ found to be the structure of the means-plus-function limitation "means for fitting an ellipse to at least one of the pixel groups." *See* ID at 31-34 (finding that the corresponding structure is equations 12-21). Apple, however, offers no citation to any expert testimony supporting its equivalence argument. Neither does the testimony of Dr. Balakrishnan that Apple cites offer any support, as discussed above. *See* CX-201C (Balakrishnan DWS) at Q. 578.

In view of the preceding discussion, we recommend that the Commission determine not to review the ID's finding that the Accused '828 Products do not infringe asserted claims 1, 2, 10, and 11 of the '828 Patent either literally or under DOE. With respect to claims 24-26, and 29, we recommend that the Commission review the ID for the limited purpose of clarifying that the ALJ's analysis with respect to the claim limitation "mathematically fit(ting) an ellipse to one or more pixel groups" in claims 1 and 10 applies equally to the claim limitation "means for fitting an ellipse to at least one of the pixel groups" in claim 24, and by dependency, in claims 25, 26, and 29. On review, we further recommend that the Commission find that the Accused '828 Products do not infringe claims 24-26, and 29 of the '828 Patent.

C.   Parties' Arguments

1.   Apple's Petition for Review

Apple contends that Motorola's proposed construction of the term "properties" in the limitation "specifying a target hardware or software component search criteria including one or more properties" recited in claim 1 of the '430 Patent "failed to give the term 'properties' a meaning consistent with its usage in the patent, and indeed failed to give the term any meaning at all, rendering it redundant of 'search criteria.'" Apple's Pet at 63-64. Apple argues that the ALJ erred by construing the claim limitation as having "only a 'plain and ordinary meaning'" and

"treating the term ['properties'] as if it has no effect on the scope of the claims." *Id*. at 64. Rather, Apple asserts, the term "properties" "is core to the invention." *Id*. Apple further argues that the ALJ improperly "ignored the extrinsic evidence, including inventor testimony" in construing the term. *Id*. at 66.

a) Motorola's Response

Motorola asserts that the ALJ correctly found that the term "properties" recited in claim 1 of the '430 Patent should be given its plain and ordinary meaning. Motorola's Resp. at 75. Motorola contends that, as the ALJ found, "the '430 [P]atent uses the term 'properties' 'very broadly'" and that "[t]he term 'properties' is not modified or limited in any way and no mention is made that properties are limited to 'desired attributes.'" *Id*. at 77 (citing ID at 62; '430 Patent at Abstract, 1:54-56). Specifically, Motorola notes that the '430 Patent specification "states that '[e]very component has some set of properties which *identify* it.'" *Id*. at 77-78 (emphasis in original) (citing '430 Patent at 5:67-68). Motorola argues that there is no support in the '430 Patent specification to support Apple's contention that attributes such as a file name, which Apple's expert, Dr. Balakrishnan, "admitted can be used to *identify* a component [], are not 'properties' within the meaning of the '430 [P]atent." *Id*. at 78 (citing Balakrishnan, Tr. at 527:17-21). Rather, Motorola contends, the intrinsic evidence leads to the opposite conclusion. *Id*. (citing RX-1874C (Locke DWS) at Q. 96, 103; '430 Patent at 5:66-6:14, 6:47-54, 8:5-42, 9:25-46, 12:66-13:30).

b) IA's Response

The IA argues that the ALJ committed no errors in construing the claim term "properties" as having its plain and ordinary meaning. IA's Resp. at 33. The IA contends that Apple's

argument that the term "properties" "should be given a special meaning based on the description of 'properties' in the specification of the '430 [P]atent" would lead to a legally erroneous construction. *Id*. at 33-34. The IA asserts that "Apple simply did not put forth sufficient evidence to compel setting aside the plain meaning of the term 'properties' and substituting the term 'desired attributes[.]'" *Id*.

c) Analysis

The ID construes the claim phrase "specifying a target hardware or software component search criteria including one or more properties" in claim 1 of the '430 Patent as having its plain and ordinary meaning. ID at 65. Apple does not dispute the ALJ's characterization of its proposed construction as attempting to distinguish between so-called "inherent" and "non-inherent," or "intrinsic" versus "non-intrinsic," characteristics. Rather, Apple specifically criticizes Motorola's proposed construction, which the ID adopts, as "attempt[ing] to invalidate this 1990s-era property-search invention over primitive name- or file-size-search technology found in well-known and well-documented operating systems such as UNIX, dating back to the 1960s and 1970s." Apple's Pet. at 63. Taking this as the contextual backdrop of the claim construction dispute, we believe that the ALJ correctly construed the limitation "properties" in accordance with the intrinsic evidence.

D. Anticipation

Pursuant to 35 U.S.C. § 102, a patent claim is anticipated when a single piece of art discloses each and every limitation of the claimed invention. *See Schering Corp. v. Geneva Pharms.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003); *CR. Bard v. M3 Sys.*, 157 F.3d 1340, 1349 (Fed. Cir. 2000). The disclosure by an invalidating reference need not be express, but may anticipate

by inherency where such inherency would be appreciated by one of ordinary skill in the art.

EMI Group North America, Inc. v. Cypress Semiconductor Corp., 268 F.3d 1342, 1350 (Fed. Cir. 2001). Anticipation does not require that the reference "teach" the subject matter of the patent. It is necessary only that the claims being challenged "read on" something that is disclosed in the reference. *Celeritas Techs., Ltd. v. Rockwell Int'l*, 150 F.3d 1354, 1361 (Fed. Cir. 1998).

Section 102 provides that, depending on the circumstances, a claimed invention may be anticipated by variety of prior art, including publications, earlier-sold products, and patents. *See* 35 U.S.C. § 102. Anticipation, like all forms of patent invalidity, must be established by clear and convincing evidence. *Glaxo Inc. v. Novopharm Ltd.*, 52 F.3d 1043, 1047 (Fed. Cir. 1995). Whether a patent claim is anticipated is a question of fact. *See Smith Kline Beecham Corp. v. Apotex Corp.*, 403 F.3d 1331, 1343 (Fed. Cir. 2005).

1. **'Enter Here # Patent**

E. **Obviousness - '607 Patent**

Under 35 U.S.C. § 103(a), a patent is valid unless "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." 35 U.S.C. § 103(a). The ultimate question of obviousness is a question of law, but "it is well understood that there are factual issues underlying the ultimate obviousness decision." *Richardson-Vicks Inc. v. Upjohn Co.*, 122 F.3d 1476, 1479 (Fed. Cir. 1997).

Once claims have been properly construed, "[t]he second step in an obviousness inquiry is to determine whether the claimed invention would have been obvious as a legal matter,

based on underlying factual inquiries including: (1) the scope and content of the prior art, (2) the level of ordinary skill in the art, (3) the differences between the claimed invention and the prior art; and (4) secondary considerations of non-obviousness." *Smiths Indus. Med. Sys., Inc. v. Vital Signs, Inc.*, 183 F.3d 1347, 1354 (Fed. Cir. 1999) (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966)). The Federal Circuit has historically required that, in order to prove obviousness, the patent challenger must demonstrate, by clear and convincing evidence, that there is a "teaching, suggestion, or motivation to combine." The Supreme Court, however, rejected this "rigid approach" in *KSR Int'1 Co. v. Teleflex Inc.*:

> The obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasis on the importance of published articles and the explicit content of issued patents. The diversity of inventive pursuits and of modern technology counsels against limiting the analysis in this way. In many fields it may be that there is little discussion of obvious techniques or combinations, and it often may be the case that market demand, rather than scientific literature, will drive design trends. Granting patent protection to an advance that would occur in the ordinary course without real innovation retards progress and may, in the case of patents combining previously known elements, deprive prior inventions of their value or utility.

KSR Int'l Co. v. Teleflex Inc., 500 U.S. 398, 402 (2007).

"Secondary considerations," also referred to as "objective indicia of non-obviousness," such as "commercial success, long felt but unsolved needs, failure of others, etc." may be used to understand the origin of the subject matter at issue, and may be relevant as indicia of obviousness or non-obviousness. *Graham*, 383 U.S. at 17- 18. Secondary considerations may also include copying by others, prior art teaching away, and professional acclaim. *See Perkin-Elmer Corp. v. Computervision Corp.*, 732 F.2d 888, 894 (Fed. Cir. 1984), cert. denied, 469 U.S. 857 (1984).

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Evidence of "secondary considerations," must be considered in evaluating the obviousness of a claimed invention, but the existence of such evidence does not control the obviousness determination. In order to accord objective evidence substantial weight, its proponent must establish a nexus between the evidence and the merits of the claimed invention, which is generally made out "when the patentee shows both that there is commercial success, and that the thing (product or method) that is commercially successful is the invention disclosed and claimed in the patent." *In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995). But secondary considerations, such as commercial success, will not necessarily dislodge a determination of obviousness based on an analysis of the prior art. *See KSR*, 500 U.S. at 426 (commercial success did not alter conclusion of obviousness). A court must consider all of the evidence under the *Graham* factors before reaching a decision on obviousness. *Richardson-Vicks*, 122 F.3d at 1483-84.

VI. Public Interest Filings

If the Commission accepts our recommendation not to review the ID's finding of no violation, there are no public interest issues relevant to the investigation. We, therefore, do not discuss the public interest submissions filed in the investigation, but will provide a supplemental memorandum if requested.

As noted above, Apple and non-party Google Inc. filed public interest statements following issuance of the RD. Newly amended Commission Rule 210.50(a)(4) invites parties to file public interest statements, if they choose to, within 30 days of the service of the RD, or in this case, by February 15, 2012. In addition, the Commission issued a notice inviting non-parties to file public interest statements by February 22, 2012. *See* Corrected Notice of Request

for Statements on the Public Interest (Jan. 25, 2012). On February 23, 2012, Apple moved for

leave to file out of time, stating in its motion that it based the filing date on the Commission's

January 25, 2012 notice and that administrative errors necessitated a one-day late filing. *See*

Apple's Mot. for Leave.

      We recommend that the Commission deny Apple's motion for leave to file its public

interest statement out of time as moot. During the process of finalizing the new rules on the

public interest, several comments expressed concern that the Commission was intending to

consider the public interest in determining whether or not there has been a violation of Section

337. Because we are recommending that the Commission decline to review the ID's finding of

no violation, we believe it would not be appropriate to accept Apple's untimely filing since

doing so may signal that the Commission takes the public interest into account in its

determination on violation.

VII. Conclusion

      For the reasons discussed above, we recommend that the Commission determine to

review the final ID in part, and on review, to affirm the ID's finding of no violation of Section

337. Specifically, we recommend that the Commission determine not to review the ID's

construction of the limitation "mathematically fit(ting) an ellipse to at least one of [the one or

more] pixel groups" in claims 1 and 10 of the '828 Patent. We also recommend that the

Commission determine not to review the ID's construction of the claim limitation "specifying a

target hardware or software component search criteria including one or more properties" in

claim 1 of the '430 Patent.

      We further recommend that the Commission determine not to review the ID's finding of

non-infringement with respect to asserted claims 1, 2, 10, and 11 of the '828 Patent. We do recommend that the Commission determine to review the ID for the limited purpose of clarifying that the ALJ also found claims 24-26, and 29 not infringed, and on review, to affirm this finding with clarification.

We also recommend that the Commission determine not to review the ID's finding that Perski '455 is entitled to claim priority to the Perski '808 Provisional and that Perski '455 anticipates the asserted claims of the '607 Patent under 35 U.S.C. § 102(e). We further recommend that the Commission determine not to review the ID's finding that Malone '870 anticipates the asserted claims of the '430 Patent under 35 U.S.C. § 102(e). In the alternative, we recommend that the Commission review the this issue only for the limited purpose of clarifying that the Commission affirms the ID on the basis of its definitional analysis of the claim limitation "operating system." We also recommend that the Commission determine not to review the ID's finding that Bondy '813 anticipates the asserted claims of the '430 Patent under 35 U.S.C. § 102(e).

We further recommend that the Commission determine to review the ID's finding that the asserted claims of the '607 Patent are obvious under 35 U.S.C. § 103 in view of SmartSkin either alone or in combination with Rekimoto '033, and on review, to take no position on this issue. Finally, we recommend that the Commission issue the attached *Federal Register* notice.