2012-1338

NONCONFIDENTIAL

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

APPLE INC.,

Appellant,

v.

INTERNATIONAL TRADE COMMISSION,

Appellee,

and

MOTOROLA MOBILITY, INC.,

Intervenor.

On appeal from the United States International Trade Commission in Investigation No. 337-TA-750.

NONCONFIDENTIAL BRIEF OF APPELLEE INTERNATIONAL TRADE COMMISSION

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Confidential information relating to the Commission's finding of non-infringement by intervenor Motorola has been redacted from pages 9-11, 27-30, 52, and 60-65 of the Commission's non-confidential brief. This material has been redacted because the material is deemed confidential business information pursuant to 19 U.S.C. § 1337(n); see also 19 C.F.R. § 210.5. The material omitted on those pages was designated as confidential business information by Motorola during the investigation, and was granted confidential treatment by the Commission.

TABLE OF CONTENTS

PAGE

TABLE OF CONTENTS CONT'D

TABLE OF CONTENTS CONT'D

TABLE OF AUTHORITIES

PAGE(S)

Cases

TABLE OF AUTHORITIES CONT'D

Statutes

Federal Register Notice

STATEMENT OF RELATED CASES

Appellee U.S. International Trade Commission ("Commission") has no information concerning related cases other than those noted by Appellant Apple, Inc., and Intervenor Motorola Mobility, Inc.

STATEMENT OF THE ISSUES

The Commission believes the issues are properly framed as follows:

1. Whether the Commission correctly determined that the asserted claims of U.S. Patent No. 7,663,607 ("the '607 patent") are anticipated by the prior art reference U.S. Patent No. 7,372,455 to Perski, et al. ("Perski '455") (A16601-36) where Perski '455 unambiguously discloses a touch screen capable of detecting multiple touches that occur at the same time.

2. Whether the Commission correctly determined that the asserted claims of the '607 patent are rendered obvious in view of the prior art reference "SmartSkin: An Infrastructure for Freehand Manipulation on Interactive Surfaces" by Jun Rekimoto ("SmartSkin") in combination with Japan Unexamined Patent Application Publication No. 2002-342033A to Jun Rekimoto ("Rekimoto '033"), where SmartSkin clearly discloses the use of transparent electrodes formed from indium-tin oxide ("ITO") in a touch-sensitive surface designed to detect multiple touches simultaneously.

3. Whether the Commission correctly construed the claim term "mathematically fit[ting] an ellipse to . . . pixel groups" in the asserted claims of U.S. Patent No. 7,812,828 ("the '828 patent") as requiring the performance of a mathematical process to fit an ellipse to the pixel group data, rather than simply calculating ellipse parameters.

4. Whether substantial evidence supports the Commission's finding of non-infringement of the asserted claims of the '828 patent even under Apple, Inc.'s ("Apple") proposed construction of the claim term "mathematically fit[ting] an ellipse to . . . pixel groups."

STATEMENT OF THE CASE

This appeal pertains to touchscreens used, for example, with modern smartphones and tablets. In particular, the technology concerns processing input from a touch-sensitive surface and the ability to recognize multiple touch inputs that occur simultaneously.

The Commission instituted this investigation on November 30, 2010, based on a complaint filed by Apple. As relevant to this appeal, Apple alleged violations by intervenor Motorola Mobility, Inc. ("Motorola") 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 the '828 and '607 patents.[1] 75 Fed. Reg. 74081-82 (Nov. 30, 2010).

[1] Apple does not appeal the Commission's determination with respect to another patent, U.S. Patent No. 5,379,430.

On January 13, 2012, the presiding administrative law judge ("ALJ") issued his final initial determination ("ID"), finding no violation of section 337. A35-497. As relevant to this appeal, the ALJ found that the accused products literally infringe the asserted claims of the '607 patent, but that those claims are invalid for anticipation under 35 U.S.C. § 102 and obviousness under 35 U.S.C. § 103. A148-69, A181-89, A212-17. The ALJ also found that the asserted claims of the '828 patent are not invalid for anticipation or obviousness, but that the accused products do not literally infringe those claims. A118-47, A179-81, A211-12.

On January 30, 2012, Apple filed a petition for review of certain aspects of the final ID. A5088-180. Among other issues, Apple requested review of the construction of the claim term "mathematically fit[ting] an ellipse" and "means for fitting an ellipse" in the '828 patent and, also, of the non-infringement finding with respect to the '828 patent. A5102-27. Apple further requested review of the findings that the '607 patent is invalid as anticipated and obvious. A5128-53.

On March 16, 2012, the Commission determined to review the final ID in part, and on review, to affirm the ID's finding of no violation of section 337 and to terminate the investigation. A498-501. In particular, the Commission determined to affirm the ID's finding that the '607 patent is obvious based on modified reasoning. A500. The unreviewed portions of the ID remain intact.

STATEMENT OF THE FACTS

I. Patents at Issue

A. The ’607 Patent

The ’607 patent, entitled “Multipoint Touchscreen,” 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. A532. In response to the multiple touches, the sensing medium produces “distinct signals representative of the location of the touches on the touch panel.” *Id*. Apple asserted claims 1-7 and 10 against Motorola. A44

Claim 1, which is representative of the limitations at issue in this appeal, recites the following:

> 1. A touch panel comprising **a transparent capacitive sensing medium configured to detect multiple touches or near touches that occur at a same time and at distinct locations in a plane of the touch panel** and to produce distinct signals representative of a location of the touches on the plane of the touch panel for each of the multiple touches, wherein the transparent capacitive sensing medium comprises:
>
> a first layer having a plurality of transparent first conductive lines that are electrically isolated from one another; and
>
> a second layer spatially separated from the first layer and having a plurality of transparent second conductive lines that are electrically isolated from one another, the second

> conductive lines being positioned transverse to the first conductive lines, the intersection of transverse lines being positioned at different locations in the plane of the touch panel, each of the second conductive lines being operatively coupled to capacitive monitoring circuitry;
>
> wherein the capacitive monitoring circuitry is configured to detect changes in charge coupling between the first conductive lines and the second conductive lines.

A561(21:35-55) (emphasis added). Figures 9 and 10 are illustrative of the claimed invention:

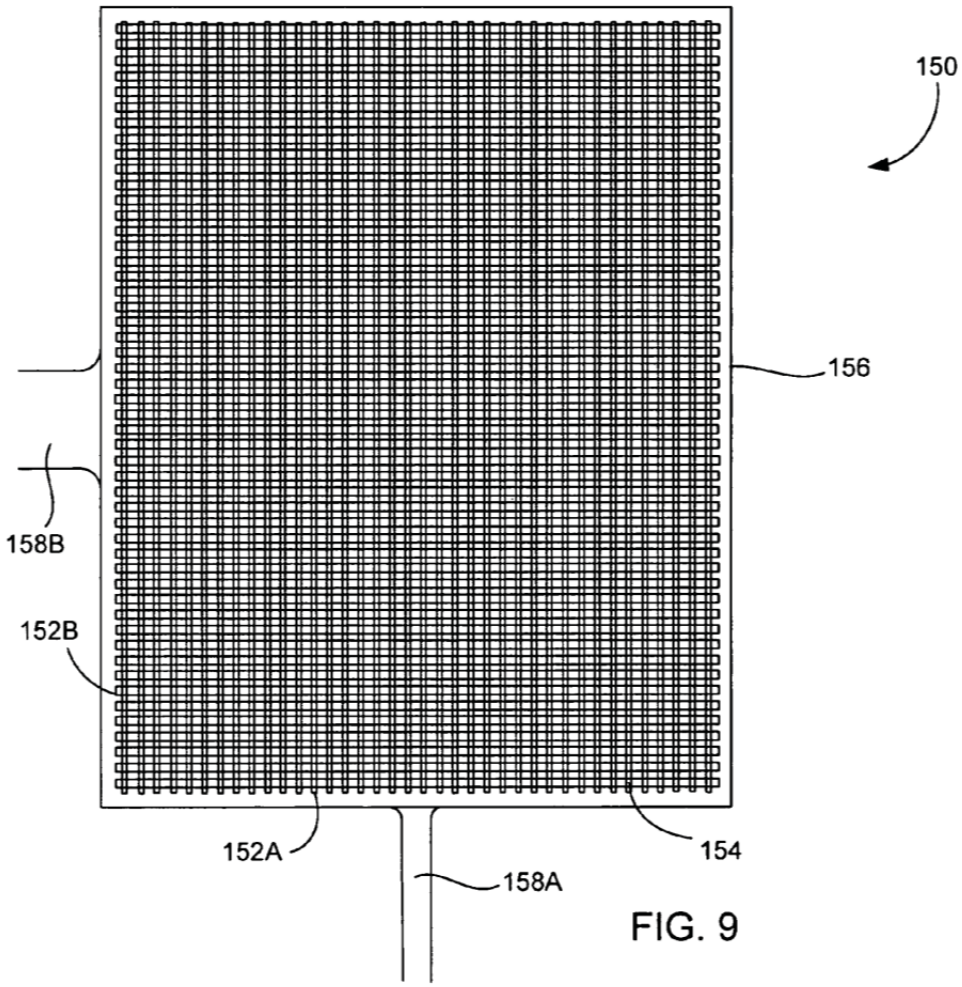

150
156
158B
152B
152A
154
158A

FIG. 9

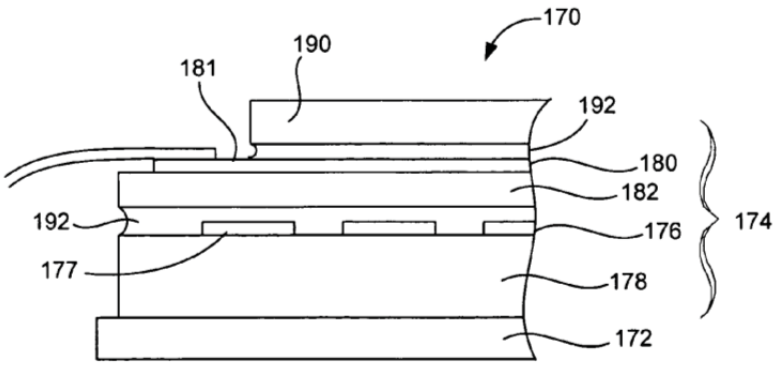

170
190
181
192
180
182
192
176
174
177
178
172

FIG. 10

A543. As shown in Figure 9, touch screen **150** includes a spatially separated, two-layer grid of lines or wires. A557(13:13-20). The lines on the different layers are configured such that the lines in one layer are generally parallel to each other while simultaneously being perpendicular to the lines in the other layer. *Id.*; *see also* A558(15:35-56), A543(Fig. 10) (showing that the lines in layer **176** (extending in and out of the page) are perpendicular to the lines in layer **180** (extending to the right and left of the page)). The lines in the different layers, therefore, intersect to produce capacitive sensing nodes **154**, each of which represents different coordinates in the plane of the touch screen. *Id.* As an object, *e.g.*, a finger, approaches the touch screen, the object capacitively couples to the lines in the layer closest to the object at the intersection points, thus stealing charge from the lines in both layers. A555(9:57-62). The '607 patent specification explains that, for the system shown in Figure 9, the set of driving lines **152A** are connected to a voltage source that drives a current through each driving line **152A** while the perpendicular set of sensing lines **152B** are connected to a capacitive sensing circuit. A557(13:30-37).

Claim 10 of the '607 patent adds the limitation that "the conductive lines" of claim 1 "are formed from indium tin oxide (ITO)." A561(22:12-13). ITO is a conductive material that is transparent. A7152, A7203-05(Q. 215, 221). The

specification explains that thinness of the deposited ITO layer necessary to achieve transparency of the sensor's conductive lines causes the ITO to be highly resistive. A558(15:3-7).

B. The '828 Patent

The '828 patent, entitled "Ellipse Fitting For Multi-Touch Surfaces," 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. A565. Apple asserted claims 1, 2, 10, 11, 24-26, and 29 against Motorola. A43. Representative claim 1 recites the following:

> 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.

A645(60:5-15) (emphasis added).

While Apple argues that the limitation "mathematically fit[ting] an ellipse" should be construed to mean "a process of computing numerical parameters that mathematically define an ellipse" (A60-61), Motorola argued before the ALJ, and

later to the Commission, that the claim limitation "mathematically fitting an ellipse" requires more than simply calculating parameters. *See* A819, A1175-76; A4387, A4474-75; A5248, A5269-75.

C. The Accused Products

Each of the Accused '828 Products contains an integrated circuit supplied by Atmel Corporation ("the Atmel chip") for processing touch data. A118. The Atmel chip [[ ]]. A118-19. [[ ]]. A119. The digital representation may be conceptualized as a "map" of the touchscreen with magnitude values for each x-y channel, which [[ ]], as shown in the example below:

CONFIDENTIAL INFORMATION DELETED

[[

]]

Id.; A19232, A19277. 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 [[ ]]. The result of this procedure is shown in the examples below:

[[

]]

A119-20; A19282-83.

CONFIDENTIAL INFORMATION DELETED

Once the Atmel chip has identified the touches, it performs further processing to generate [[ ]] – which "comprises [[ ]], and (for one of the accused products) [[ ]]." A120. Specifically, in the Accused '828 Products, [[ ]] 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 [[ ]] represent [[ ]]. A121. The value [[ ]]. *Id*. The value [[ ]]. *Id*. Lastly, in one of the accused products, [[ ]] the value [[ ]]. A121-22.

II. Relevant Findings

A. Invalidity of the ’607 Patent

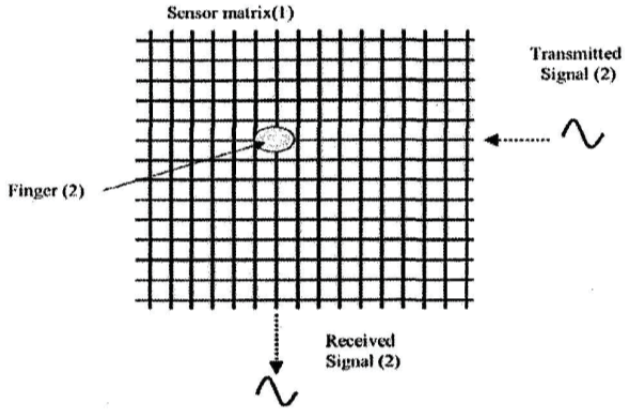
1. Anticipation

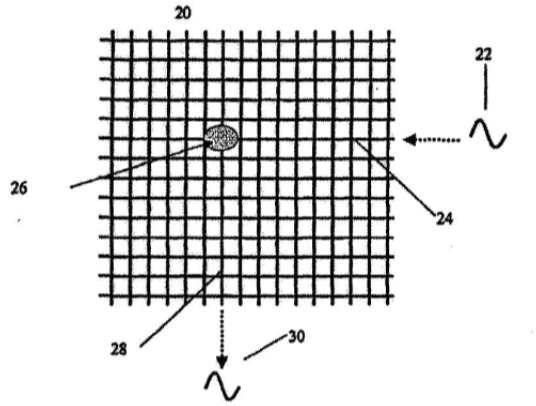
Apple challenges the ALJ’s unreviewed findings regarding anticipation. The ALJ found that Perski ’455, which was filed on January 15, 2004, is prior art to the ’607 Patent under 35 U.S.C. § 102(e) and that Perski ’455 anticipates the asserted claims of the ’607 Patent. A182, A186.

Apple argued before the ALJ that the invention of the ’607 patent was entitled to a conception date between September 2003 and November 2003. A181. Motorola countered that Perski ’455 is entitled to claim priority to U.S. Provisional Patent application No. 60/466,808 to Perski (“Perski ’808”) (A16147-55), which was filed on February 10, 2003. *Id*. Apple disagreed, arguing that Motorola failed to present any specific analysis concerning which portions of Perski ’808 support the relevant disclosure in Perski ’455. *Id*. Motorola asserted that, in any event, Apple failed to prove that the subject matter of the asserted claims was conceived prior to the January 15, 2004 filing of Perski ’455 and subsequently diligently reduced to practice. A4859, A4898-99.

The ALJ found that Perski ’455 is entitled to claim priority back to Perski ’808 because the disclosure in Perski ’455 “finds support in Perski ’808.” A181.

Specifically, the ALJ noted that Perski '808 "discloses 'utiliz[ing] a patterned transparent conductive foil system . . . in order to enable multiple and simultaneous finger inputs direct on the display' and containing the same figure showing a grid of transparent conductive lines used to detect multiple touches using mutual capacitance as in Perski '455." A181-82 (citing A16149 at ¶1).





Compare Perski '808 (A16154 on left) *with* Perski '455 (A16621 on right). The ALJ also noted that Perski '808 "discloses a finger detection method in which horizontal lines are driven and vertical lines sensed, while in Perski '455, fingers are detected using a change in mutual capacitance between the drive lines and the sense lines." A182 (*compare* A16151 at ¶5 *with* A16610(13:30-43)). The ALJ further noted that both Perski '808 and Perski '455 disclose "algorithms for use with the transparent mutual capacitance touch sensor to detect multiple, simultaneous finger touches." *Id*. (*compare* A16152 at ¶1-3 *with* A16610(14:15-

59)). The ALJ noted that Apple failed to cite any authority to support its contention that a "portion by portion analysis need be performed" in order for him to find that Perski '455 is supported by Perski '808. *Id*. The ALJ also pointed out that Apple "fail[ed] to cite to any portion of Perski '455 that is not supported by" Perski '808. *Id*.

As Motorola argued before the ALJ, the only limitations of the asserted claim of the '607 patent that Apple cited as allegedly not being disclosed by Perski '455 are the limitations concerning the recognition of multiple touches at distinct locations on the touch panel recited in claims 1 and 10. A183. With respect to this point, Apple contended that Perski '455 does not disclose the disputed limitations "because (1) the disclosed method in Perski '455 is 'too slow to detect multiple touches that occur "at the same time"'; (2) the method has the same problems as other prior art in recognizing and distinguishing the number of touches; and (3) Perski '455 actually teaches away from the detection of multipl[e] touches that occur at the same time." *Id*.

The ALJ found that "Motorola has shown by clear and convincing evidence that Perski '455 discloses detecting multiple finger touches at the same time." *Id*. In particular, the ALJ found that the following language recited in Perski '455 "expressly discloses a finger detection algorithm that is able to detect multiple

touches at the same time:" (A183)

> The most simple and direct approach is to provide a signal to each one of the matrix lines in one of the matrix axes, one line at a time, and to read the signal in turn at each one of the matrix lines on the orthogonal axis . . . If a significant output signal is detected, it means that there is a finger touching a junction. The junction that is being touched is the one connecting the conductor that is currently being energized with an input signal and the conductor at which the output signal is detected. The disadvantage of such a direct detection method is that it requires an order of n*m steps, where n stands for the number of vertical lines and m for the number of horizontal lines. In fact, because it is typically necessary to repeat the procedure for the second axis so the number of steps is more typically 2*n*m steps. **However, this method enables the detection of multiple finger touches**. **When an output signal is detected on more than one conductor that means more than one finger touch is present**. The junctions that are being touched are the ones connecting the conductor that is currently being energized and the conductors which exhibit an output signal.

A184-85 (citing A16610(14:20-43)) (emphasis added);

> The goal of the finger detection algorithm, in this method, is to recognize all of the sensor matrix junctions that transfer signals due to external finger touch. **It should be noted that this algorithm is preferably able to detect more than one finger touch at the same time**.

A184 (citing A16610(14:15-19)) (emphasis added).

The ALJ found that "the algorithm or method disclosed in Perski '455 for detecting multiple touches is virtually identical to the disclosure in the '607

patent." A184. In particular, the ALJ noted the following disclosure in the '607 parent regarding the ability to detect multiple touches:

> In mutual capacitance, the transparent conductive medium is patterned into a group of spatially separated lines formed on two different layers. . . . The driving lines are connected to a voltage source and the sensing lines are connected to capacitive sensing circuit. **During operation, a current is driven through one driving line at a time, and because of capacitive coupling, the current is carried through to the sensing lines at each of the nodes (*e.g.*, intersection points)**. Furthermore, the sensing circuit monitors changes in capacitance that occurs at each of the nodes. **The positions where changes occur and the magnitude of those changes are used to help recognize the multiple touch events**.

A185 (citing A553(5:46-6:2)). Specifically, the ALJ found that both Perski '455 and the '607 patent generally disclose similar methods of detecting multiple finger touches on a transparent mutual capacitance sensor, including: "providing a signal to each drive line, one line at a time, and measuring the signals that travel through the mutual capacitance onto orthogonal sense lines and when an output signal is detected at one or more of the intersections, touches are detected." A184 (citing A18039, A18161-62; A16608(9:52-60), A16610(14:20-43), A16621(Fig. 2); A543(Fig. 9), A553(5:46-6:2), A557(13:13-20)).

The ALJ further found that the requirement recited in claim 1 of the '607 patent of "produc[ing] distinct signals representative of a location of the touches on

the plane of the touch panel for each of the multiple touches" and a transparent capacitive sensor medium "configured to detect multiple touches or near touches that occur at the same time" (A561(21:35-41)) is disclosed in the "finger detection algorithm" of Perski '455, which "recognize[s] all of the sensor matrix junctions that transfer signals due to external finger touches" and "is preferably able to detect more than one finger touch at the same time" (A16610(14:15-19)). A185 (citing A18164-65). Accordingly, the ALJ rejected Apple's argument that "Perski '455 teaches away from multiple touches at the same time" and that "Perski '455 suffers from the same prior art problems described in the '607 patent." A185-86 (citing A16610(14:15-19); A31621, A31757:15-58:2 (Subramanian)).

Likewise, the ALJ rejected Apple's argument that the method disclosed in Perski '455 "is too slow to detect multiple touches that occur 'at the same time,'" finding that Apple did not refer to any claim limitation or discussion in the '607 patent specification concerning "the speed at which the drive lines are driven and the sense lines sensed" such that speed would be relevant to the claimed multi-touch detection scheme. A186. Nor, the ALJ found, did Apple offer any evidence that the "faster" method disclosed in Perski '455 indicates that the "simple and direct approach" disclosed in Perski '455 is "slow" in comparison with the method disclosed in the '607 patent. *Id*. (citing A16610(14:57-59).

2. Obviousness

a. Final ID

The ALJ found that the asserted claims of the ’607 Parent are obvious in view of SmartSkin alone and in combination with Rekimoto ’033. A212-13. Apple had argued that SmartSkin does not disclose the transparent electrode limitations for the same reasons that the ALJ found SmartSkin does not anticipate the asserted claims of the ’607 Patent. *Id.*; *see* A187-89 (finding that “the disclosure of ITO in SmartSkin is insufficient” to show, by clear and convincing evidence, that “SmartSkin discloses [the transparent electrode limitations, the layer limitation, the ‘glass member’ limitation], and the [limitation reciting] use of transparent conductive lines using ITO.”). Apple also argued that the combination of SmartSkin and Rekimoto ’033 does not disclose the layer and glass limitations because Rekimoto ’033 and SmartSkin disclose different sensors, there is no motivation to combine without “improper hindsight bias,” and “Rekimoto ’033 discloses only a single glass substrate and not the second and third glass member.” A212.

The ALJ found that “SmartSkin alone would render the use of transparent electrodes obvious.” *Id.* The ALJ noted that, since SmartSkin “*itself* discloses using transparent electrodes,” it provides the motivation to combine the multi-

touch sensor taught in SmartSkin with a transparent sensor. A212-13 (citing A15557, A15574(63:11-64) (testimony of '607 Patent inventor, Mr. Strickon that he got "the idea for the initial prototype from" SmartSkin; A16145 (email from Strickon) ("Sony CSL [Sony Computer Science Laboratories, Inc.] has demonstrated a technology that could work for multitouch input."). The ALJ also found that "ITO was well known at the time." A213. The ALJ, therefore, found that "SmartSkin would motivate one of ordinary skill in the art to use transparent electrodes and that the use of materials, such as ITO, in creating the transparent electrodes was well known at the time [of the invention of the '607 Patent]" and as such "would have been obvious to one of ordinary skill in the art." *Id*.

The ALJ also found that SmartSkin, in combination with Rekimoto '033, discloses "the use of transparent electrodes, the layer limitations, and the glass member limitation." *Id*. The ALJ noted that both Rekimoto '033 and SmartSkin stem from Sony CSL and that Rekimoto '033, which was filed May 21, 2001, was published on November 29, 2002, "within months of the publication of the SmartSkin reference." A214. The ALJ found that one of ordinary skill in the art "would be able and motivated to combine the teaching of Rekimoto '033 regarding layers, glass, and transparent electrodes placed over an LCD display with SmartSkin" because of their similar and contemporaneous origins, and because

they both "describe a multi-touch mutual capacitance, row and column sensor from the same inventor, made for the same employer, published in the same year, using the same detection circuitry." *Id.*; *see* A215-16 (citing A19221, A19228(Fig. 1), A19231(Fig. 9); A13597, A13598(Fig. 2)).

With respect to secondary considerations, the ALJ found that Apple "failed to overcome the strong showing of obviousness." A217. He thus rejected Apple's argument that the commercial success of the iPhone, iPad, and iPod touch family of devices "in the face of industry skepticism; the significant praise of the iPhone and its multi-touch touchscreen; and attempts to copy the iPhone 4 rebuts any allegations of obviousness." A216. The ALJ found that the iPhone 4's commercial success was not enough to "overcome the strong showing of obviousness in this instance." A216-17. Moreover, the ALJ found, "the evidence shows that the iPhone's success stems from other product characteristics such as its slim profile, light weight, good battery life, attractive design, easy to use software, and availability of numerous popular applications, songs, and videos." A217 (citing A18187-89).

b. Commission Determination

The Commission determined to review the ALJ's findings regarding obviousness. A503. On review, the Commission, based on modified reasoning,

affirmed the ALJ's finding that the asserted claims of the '607 patent are obvious in view of SmartSkin in combination with Rekimoto '033. A503-04. Specifically, the Commission found that Rekimoto '033 does not teach the use of transparent electrodes, but agreed with the ALJ that this limitation is present in the SmartSkin reference. A509. In particular, the Commission noted the ALJ's finding that the use of ITO in creating transparent conductive lines or electrodes was well known at the time of the invention of the '607 patent. A510 (citing A213). The Commission also found that the evidence showed that the combination of transparent ITO electrodes with the mutual-capacitance touch screen disclosed in SmartSkin would be operable for different reasons from those articulated in the final ID. A509.

The Commission credited the testimony of Motorola's expert, Dr. Wolfe, that Figure 2 of SmartSkin in conjunction with the disclosure concerning the use of ITO is sufficient to instruct one of ordinary skill in the art how to build a transparent sensor. A511 (citing A31249, A31451:14-A31452:5, A31533:11-22, A31534:20-A31535:8). The Commission also noted Dr. Wolfe's rebuttal to the criticism of Apple's expert, Dr. Subramanian, that SmartSkin does not provide the necessary disclosure to show one of ordinary skill how to "'obtain' a transparent sensor using ITO." A512 (citing A8724, A8760-61). Specifically, Dr. Wolfe stated that:

> The ’607 patent does not disclose any special characteristics of the ITO that make it suitable for use in the ’607 patent; not its resistivity, capacitance, uniformity, thickness, or thermal characteristics. In any case, none of these need be disclosed since normal, commercially available and well known ITO materials are suitable for both SmartSkin and the ’607 patent.

A18171; *see also* A31532:19-A31539:16 (Wolfe testifying that one of ordinary skill in the art would know how to implement the SmartSkin sensor using transparent ITO electrodes).

The Commission also rejected Apple’s argument that the SmartSkin reference does not enable the use of a transparent ITO sensor with the multi-touch mutual-capacitance sensor disclosed in that reference because the use of a high resistance material such as transparent ITO with the voltage-based sensing system of SmartSkin would require a complete system redesign. A512-13. Rather, the Commission noted, the language of the asserted claims does not recite any particular type sensing method or arrangement. A514. As such, the Commission found Apple’s arguments that a transparent ITO sensor can only be implemented with a charge-counting sensor to be irrelevant to the obviousness analysis. *Id*.

Moreover, the Commission noted that, in discussing whether Perski ’455 anticipates the asserted claims of the ’607 Patent, Dr. Subramanian testified that Perski ’455 discloses “a straight voltage amplifier, similar to that of [the SmartSkin

reference]." A514-15 (citing A31795:25-A31796:2). The Commission found that Perski '455, by way of U.S. Patent Provisional Application No. 60/406,662 ("Morag '662") (filed in August 2002), which Perski '455 incorporates by reference, explicitly discloses the use of a voltage amplifier in a voltage-sensing system with high-resistance transparent electrodes. A515; A16608(10:16-21).[2] Specifically, the Commission noted that Morag '662 explains as follows:

> The resistance of the conductive lines is relatively high and it might exceed 100 KOhm for a line. Higher resistance of transparent conductors results in a higher transparency of the material. Therefore, it is a general object of the present invention to enable working with high resistance of the sensor grid.

Id. (citing A16573, A16578 at ¶2). The Commission, therefore, found that the concept of using a voltage-sensing system with high-resistance transparent electrodes was known in the art at the time of the '607 Patent. *Id*.

B. The '828 patent

1. Claim Construction

The ALJ construed the claim phrase "mathematically fit[ting] an ellipse" in claims 1 and 10 of the '828 patent to require "performing a mathematical process

[2] Apple argued in its petition of review before the Commission that Perski '808 does not properly incorporate Morag '622 and that Dr. Wolfe relied on this reference to teach several of the structural limitations recited in the asserted claims of the '607 patent, such as ITO. *See* A5135. Apple does not further pursue this argument on appeal.

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." A70. Apple had proposed to the ALJ that this limitation be construed to mean "computing numerical parameters that mathematically define an ellipse." A71. 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." A60-61. 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. A61. Moreover, Apple asserted that, during prosecution of the application leading to the '828 patent, the applicants distinguished the claimed invention from U.S. Patent No. 5,825,352 to Bisset et al. ("Bisset '352"), the prior art applied by the United States Patent and Trademark ("PTO") examiner in rejecting their claims, by arguing that Bisset '352 does not disclose any type of ellipse fitting but, rather, only the data acquisition steps that precede ellipse fitting. A62-63.

The ALJ rejected Apple's proposed construction, finding that it "would read out the requirement [as recited in the claims] that an 'ellipse' must be 'fitted' 'mathematically' to the pixel groups." A63. 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 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." A64 (emphasis added). In particular, the ALJ 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*. The ALJ rejected Apple's proposed 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 used *ex post* to generate an ellipse that could be fitted over the pixel groups." A68-69.

The ALJ declined to rely on the witness statement of Dr. Westerman, one of the named inventors of the '828 patent, in which he claimed that the methodology described in the '828 patent at the top of column 27 (A629(col. 27:1-8)) discloses an alternate method of "mathematically fit[ting] an ellipse." A69; *see* A7398,

A7401. Instead, the ALJ relied on Dr. Westerman's hearing testimony, which was consistent with the specification, that this so-called "second embodiment" is an alternative to – not an example of – ellipse fitting." *Id*. (citing A30354:25-A30355:8). The ALJ further noted the corroborating deposition testimony – introduced in the witness statement of Motorola's witness, Mr. Wolfe – 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 A18257 (quoting A15461, A15492 (p. 192))).[3] The ALJ found that Mr. Elias' testimony is most consistent with the commonly-used mathematical meaning of the term "fitting." A69-70 (citing Merriam Webster Dictionary definition of "curve fitting;" *ATA Airlines, Inc. v. Fed. Express Corp.*, 665 F.3d 882, 890 (7th Cir. 2011) (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")).

[3] The ID inadvertently cites to RX-1895C (A19232-409). Furthermore, the RX-1885C (A18039-19210) exhibit cites the incorrect pages of the Elias deposition.

Based on the intrinsic and extrinsic evidence, the ALJ therefore concluded that "mathematically fit[ting] an ellipse to one or more pixel groups" means "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." A70.

2. Infringement

a. Motorola Xoom (Non-Test Build)

The ALJ found that the Motorola Xoom (non-test build) does not literally infringe the asserted claims of the '828 patent because it does not satisfy the claim limitation "mathematically fit[ting] an ellipse to . . . pixel groups" as recited in claims 1 and 10. A133. Specifically, the ALJ found "the Atmel chip [[ ]]." *Id*. The ALJ noted that Apple's expert, Dr. Balakrishnan, did not explain how the measurements performed by the Atmel chip [[ ]]. *Id*. Rather, the ALJ found that Dr. Balakrishnan's testimony shows that "[[ ]]" A134 (citing A30491, A30661:24-A30666:4).

The ALJ also rejected Apple's argument that the "mathematically fit[ting] an ellipse" limitation is satisfied by the Android operating system alone or in

combination with the Atmel chip. A133-34. Specifically, the ALJ found that the Android operation system layer [[ ]], even though it does receive some limited data from [[ ]], and therefore, receives no information regarding [[ ]]. *Id*.; *see also* (A30883, A31145:22-A31146:11, A31154:5-19) (senior Google software engineer, Mr. Brown, discussing the Android operation system).

b. Motorola Xoom (Test Build) and the Remaining Accused '828 Products

The ALJ found that the Motorola Xoom (test build) ("XoomTB") and the remaining '828 Accused Products (collectively the "other '828 Accused Products") also do not literally infringe the asserted claims of the '828 patent because they do not satisfy the claim limitation "mathematically fit[ting] an ellipse to . . . pixel groups" as recited in claims 1 and 10. A139-40; *see* A136, n.9, A140, n.10 (identifying the other '828 Accused Products). In the XoomTB, Motorola modified the source code [[ ]] and to rename several of the other variables. A135. In the XoomTB, only the values for [[ ]] are reported to the Android operating system. *Id*. The values for the major and minor axis [[ ]], while in the other '828 Accused Products, they are computed by [[ ]]. A136.

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The ALJ found that the information passed to the XoomTB, namely touch area, touch position (x,y) and pressure, are "simply measurements made by [[ ]]," and therefore, there is no ellipse-fitting being performed to determine these values. A139 (citing A19275-76, A19287, A19380-81; A18026, A18029-30; A31145:22-A31146:10 (Brown)). Specifically, the ALJ noted that "there is nothing elliptical about the result [[ ]]" because "an ellipse cannot have both [[ ]];" such an object would be neither an ellipse nor a circle. *Id*. The ALJ further found that no ellipse-fitting occurs to determine the remaining values – [[ ]] – which are instead [[ ]]." *Id.* The ALJ noted that, "[m]oreover, [[ ]] bears no relation to any elliptical parameter and does not suggest any fitting of an ellipse." *Id.*

The ALJ also found that, even considering the Android code there is still no infringement because Apple presented insufficient evidence that the values getTouchMajor() and getTouchMinor(), which are calculated [[ ]], define an ellipse [[ ]]. A139-40. The ALJ found that the "[[ ]] are simply measured from the sensors" and, at any rate, those values "are not ellipse parameters and provide no information [[

[redacted]]]." A140.

Lastly, the ALJ also rejected Apple's "second embodiment" argument, finding that, even assuming that the "second embodiment" (*see* the '828 patent at column 27) was intended to disclose an ellipse-fitting procedure, the variable "[[[redacted]]] is a very different value than what the '828 patent calls 'total group proximity.'" *Id*. (citing A19282-83). The ALJ found that, "according to the '828 patent, 'total group proximity' is the sum of proximity values for an entire contact" and therefore the variable [[[redacted]]] would not infringe. A140-41 (citing A628(26:12-13)).[4]

SUMMARY OF ARGUMENT

The ALJ correctly found that asserted claims of the '607 patent are invalid as anticipated by Perski '455, and further, that Perski '455 is prior art to the '607 patent. Substantial evidence supports the finding that Perski '455 explicitly discloses all of the limitations of the asserted claims, and in particular, discloses the limitation "detecting multiple touches at the same time." None of the criticisms leveled by Apple toward the disclosure of Perski '455 concern the

[4] The ALJ also found that the accused products do not infringe the asserted claims of the '828 patent under the doctrine of equivalents ("DOE"). A143-45. Although Apple generally challenges the ALJ's finding of non-infringement, Apple does not dispute the ALJ's factual findings concerning DOE in this appeal.

claimed features of the invention recited in the asserted claims of the ’607 patent, and are, therefore, irrelevant to the question of anticipation. Furthermore, substantial evidence supports the finding that Perski ’455 properly claims priority to its provisional application, Perski ’808, which provides ample support for the disclosure in Perski ’455 concerning the detection of multiple touches.

Substantial evidence also supports the Commission’s underlying factual findings concerning its determination that the asserted claims of the ’455 patent are obvious in view of the SmartSkin reference in combination with Rekimoto ’033. Apple focuses on features that it argues are necessary to make the multi-touch sensor disclosed in SmartSkin work with a transparent sensor. However, none of these features are recited in the asserted claims at issue. As such, any reference to these features is irrelevant to the question of whether one of ordinary skill in the art would find the invention recited in the asserted claims obvious in view of the references relied on by the Commission. Moreover, secondary considerations do not support a finding of non-obviousness where evidence is lacking that the particular features of the invention recited in the asserted claims of the ’607 patent are responsible for the commercial success of or the praise directed toward Apple’s products. Furthermore, Apple has failed to show that Motorola attempted to copy any features of the invention as claimed.

The ALJ also correctly construed the limitation "mathematically fit[ting] an ellipse to at least . . . one [or more] pixel groups " in the asserted claims of the '828 patent as requiring "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." The ALJ's construction is supported by both the explicit language of the claims, as well as the disclosure of the '828 patent. In particular, the ALJ's construction properly gives meaning to each word in the claim, which recites a specific type of ellipse fitting, namely "mathematically fitting." Apple's proposed construction – that the ellipse-fitting process consists merely of computing ellipse parameters – erroneously ignores this limitation. Moreover, the specification of the '828 patent indicates that the process of mathematically fitting an ellipse is distinct from the procedure of deriving or calculating ellipse parameters. Likewise, the prosecution history supports the ALJ's construction, as the patent applications distinguished their invention over Bisset '352 by arguing that the process of "fitting an ellipse" is different from the process of obtaining measure data disclosed in Bisset '352.

Lastly, even if the Court disagrees with the ALJ's construction of the limitation "mathematically fit[ting] an ellipse," substantial evidence supports the ALJ's finding that the accused products do not infringe the asserted claims of the

’828 patent because the data computed by the accused products are neither obtained as a result of fitting an ellipse to the pixel data nor do they represent ellipse parameters. Rather, the accused products obtain data concerning the pixel groups by various direct measurements of the channels that digitally represent the electronic signals from the touch screen, rather than from any ellipse-fitting procedure.

ARGUMENT

I. STANDARD OF REVIEW

Claim construction, the first step of an infringement analysis, is a question of law which this Court reviews *de novo*. *Finnigan Corp. v. Int’l Trade Comm’n*, 180 F.3d 1354, 1362 (Fed. Cir. 1999). The second step of an infringement analysis involves the comparison of the claims to the accused device, and is a factual determination reviewed under the substantial evidence standard. *Id*.; 19 U.S.C. § 1337(c); 5 U.S.C. § 706(2)(E).

Anticipation is a question of fact, which is reviewed for substantial evidence. *Cordis Corp. v. Boston Scientific Corp.*, 561 F.3d 1319, 1335 (Fed. Cir. 2009). “Obviousness is a question of law based on underlying factual inquiries, and thus” the Court reviews “the Commission’s ultimate determination *de novo* and factual determinations for substantial evidence.” *Vizio, Inc. v. Int’l Trade Comm’n*, 605

F.3d 1330, 1342 (Fed. Cir. 2010). These factual determinations include "the scope and content of the prior art," "differences between the prior art and the claims at issue," and "objective indicia of nonobviousness." *Finisar Corp. v. DirecTV Group, Inc.*, 523 F.3d 1323, 1338-39 (Fed. Cir. 2008).

II. THE ALJ CORRECTLY FOUND THAT THE ASSERTED CLAIMS OF THE '607 PATENT ARE INVALID AS ANTICIPATED UNDER 35 U.S.C. § 102

A. Perski '455 Discloses All of the Limitations of the Invention Claimed in the '607 Patent

Apple argues that Perski '455 "does not teach a full image multi-touch sensor, much less pose the solutions necessary to make it a reality." Apple Br. at 56. Neither, however, do the asserted claims of the '607 patent. The claimed invention of the '607 patent concerns only the structural features of the touchscreen, including the configuration of the conductive lines comprising the capacitive sensing medium and that the medium be transparent, along with the functional requirement that the claimed "touch panel" be able to "detect multiple touches or near touches that occur at a same time and at distinct locations." A561(21:36-37); *see also* A561(22:27-29), A532. The claims do not speak to any particular method of how the detection is performed, to the speed at which the claimed detection must occur, or to the type of sensor that must be used.

In an anticipation analysis, the correct comparison is between the proffered

prior art and the limitations of the claimed invention, not between the prior art and the asserted patent's general disclosure. *See Celeritas Techs., Ltd. v. Rockwell Int'l Corp.*, 150 F.3d 1354, 1361 (Fed. Cir. 1998) ("[A] claim is anticipated if each and every limitation is found either expressly or inherently in a single prior art reference."). Nonetheless, Apple improperly attempts to compare unclaimed features of the '607 Patent directly to Perski '455.

The limitation in question, as represented by asserted claim 1, reads as follows:

> A touch panel comprising a transparent capacitive sensing medium configured **to detect multiple touches or near touches that occur at a same time and at distinct locations** in a plane of the touch panel and to produce distinct signals representative of a location of the touches on the plane of the touch panel for each of the multiple touches.

A561(21:35-40) (emphasis added). Although Apple asserts that the "speed" and "accuracy" of the multi-touch detection method are crucial to the analysis, nothing in the claim language mentions these elements. *See* Apple Br. at 57.

As this Court has explained, a determination of anticipation, as well as obviousness, involves two steps: "[f]irst is construing the claim, a question of law for the court, followed by, in the case of anticipation or obviousness, a comparison of the construed claim to the prior art." *Key Pharm. v. Hercon Labs. Corp.*, 161 F.3d 709, 714 (Fed. Cir. 1998). Before the Commission, Apple asserted in the

context of its infringement argument that the phrase "at a same time" in the preamble of claim 1 should be interpreted to mean "at the same time as viewed by the user." A4171, A4281-82. While Motorola argued in its pre-hearing brief to the ALJ that the phrase "at the same time" required no delay in detection (A1011-14), Motorola did not further pursue this argument in its post-hearing brief. Rather, Motorola based its final non-infringement contentions on only the structural limitations of claim 1. *See* A4415-26. Under the ALJ's ground rules, issued at the beginning of the investigation, any argument not presented in the parties' post-hearing briefs was deemed waived. A40001, A40043(11.1). As such, the ALJ neither construed this term nor specifically addressed it in finding that the accused Motorola products infringe the asserted claims of the '607 patent. A149-50. Thus, neither the ALJ nor the full Commission construed the claim limitation "at a same time" beyond its ordinary meaning.[5]

[5] While the ALJ found that the sensor integrated circuits in the accused Motorola products are able to detect capacitive changes at the intersection between the two sets of conductive lines "by scanning one or more rows of intersections at a time and are able to measure all of the intersections in less than one one-thousandth of a second" (A149), he in no way stated that Perski '455 does not disclose the multi-touch device claimed in the '607 patent. For example, the ALJ did not state that the speed at which the accused devices operate was the sole basis for his finding that they satisfy the preamble of claim 1 of the '607 patent. Indeed, the ALJ also found that the accused Motorola products are capable of "support[ing] multiple touch gestures" such as "pinch to zoom" and other "two-touch gestures" without

Apple contends that the ALJ "acknowledge[d]" that the language of claim 1 requires a device that detects touches with a certain speed, although Apple fails to state what that necessary speed is. Apple Br. at 57-62. Nor could there be a reasonable basis for Apple to be more specific, given that the claims are completely silent on the speed at which detection of multiple touches must occur beyond the requirement that the touch panel be able to detect touches that occur "at a same time."

Perski '455 explicitly discloses detecting multiple touches at the same time:

> The goal of the finger detection algorithm, in this method, is to recognize all of the sensor matrix junctions that transfer signals due to external finger touch. It should be noted that this algorithm is **preferably able to detect more than one finger touch at the same time**.
>
> . . .
>
> The most simple and direct approach is to provide a signal to each one of the matrix lines in one of the matrix axes, one line at a time, and to read the signal in turn at each one of the matrix lines on the orthogonal axis. . . . If a significant output signal is detected, it means that there is a finger touching a junction. The junction that is being touched is the one connecting the conductor that is currently being energized with an input signal and the conductor at which the output signal is detected. The disadvantage of such a direct detection method is that it requires an order of n*m steps, where n stands for the number of vertical lines and m for the number of horizontal lines. In fact, because it

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specifically tying this functionality to the speed at which the devices operate. A150.

> is typically necessary to repeat the procedure for the second axis so the number of steps is more typically 2*n*m steps. However, **this method enables the detection of multiple finger touches**. **When an output signal is detected on more than one conductor that means more than one finger touch is present**. The junctions that are being touched are the ones connecting the conductor that is currently being energized and the conductors which exhibit an output signal.

A16610(14:15-43) (emphasis added). This disclosure is clear. Moreover, the '607 patent discloses a similar method of detecting multiple touches:

> In mutual capacitance, the transparent conductive medium is patterned into a group of spatially separated lines formed on two different layers. . . . The driving lines are connected to a voltage source and the sensing lines are connected to capacitive sensing circuit. **During operation, a current is driven through one driving line at a time, and because of capacitive coupling, the current is carried through to the sensing lines at each of the nodes (e.g., intersection points).** Furthermore, the sensing circuit monitors changes in capacitance that occurs at each of the nodes. **The positions where changes occur and the magnitude of those changes are used to help recognize the multiple touch events**.

A553(5:46-6:2) (emphasis added); A185. Again, the asserted claims of the '607 patent do not recite any particular speed with which the detection must occur. All that the claims explicitly require is a touch-screen that is configured to "detect multiple touches or near touches that occur at a same time and at distinct locations." A561(21:35-22:60). Apple fails to point to any evidence that is contrary to the unambiguous disclosure of Perski '455, which teaches "preferably

[being] able to detect more than one finger touch *at the same time*" and further states that the method taught in that reference "enables the detection of multiple finger touches," does not satisfy this requirement. *See* A16610(14:15-43) (emphasis added).

Nor does, or can, Apple point to anything in the claims or specification of the '607 patent to support this purported speed requirement. Rather, in its briefs both to the Commission and this Court, Apple refers only to a single embodiment, among the many disclosed in the specification of the '607 patent, in which the sensing lines are sensed in parallel while the driving lines are driven one at a time. *See* A557(13:38-42). This embodiment, however, is not claimed. Moreover, Apple has not argued that the functional limitation "detect[ing] multiple touches or near touches that occur at a same time" should be restricted to this detection scheme. As such, Apple's attempt to so limit the scope of the asserted claims is improper. *See i4i Ltd. P'ship v. Microsoft Corp.*, 598 F.3d 831, 843 (Fed. Cir. 2010) (declining to limit claims to an embodiment where the embodiment is not recited in the claims absent a clear intention to so limit the claim's scope).[6]

[6] Assuming that such a comparison of the prior art and the disclosure of the '607 patent was appropriate, the Commission notes that Perski '808, in fact, discloses this very parallel sensing scheme. *See* 16152 (teaching the ability to "sample a group of reception lines at the same time, and even to sample all reception lines simultaneously, thus reducing the number of steps to n.").

Apple further notes the disclosure in the specification of the ’607 patent that the capacitive sensing circuit detects current changes at each intersection node “at about the same time (as viewed by a user) so as to provide multipoint sensing.” Apple Br. at 58 (citing A559(17:33-36)). The claims themselves, however, do not recite this limitation concerning observation by a viewer. Limiting the asserted claims based on this disclosure is improper on that basis alone. *See i4i,* 598 F.3d at 843. Additionally, this disclosure, which is in the context of a single embodiment among the many described in the ’607 patent, offers no hint as to precisely what speed of detection is required such that the detection appears to occur at the same time from a viewer’s perspective. Particularly given this lack of specificity, Apple has not and cannot cite to any evidentiary basis to conclude that Perski ’455 – which unambiguously states that the system disclosed in that reference is capable of detecting multiple touches that occur “at the same time” – does not satisfy this condition.

Apple argues that “2xNxM” detection algorithm disclosed in Perski ’455 (A16610(14:20-43)) is too slow to detect multiple touches simultaneously. Apple Br. at 61. Even assuming that the reference of the viewer is important, the ALJ correctly found that “[t]here is nothing in Perski ’455 to indicate that the method disclosed therein would not be able to detect touches ‘at the same time’ as viewed

by a user." A186. Contrary to Apple's contention, the ALJ did not improperly shift the burden of proof concerning whether Perski '455 anticipates. Apple Br. at 62. Rather, the ALJ first found that Perski '455 explicitly and unambiguously discloses multi-touch detection and then found that Apple had not offered any evidence to rebut this conclusion. Apple argued before the ALJ, as it does before this Court, that Perski '455 does not enable multi-touch detection. As this court has held, however, a prior art reference is presumed enabled. *Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1355 (Fed. Cir. 2003). As such, while the ALJ properly placed the burden on Motorola to demonstrate that Perski '455 discloses all of the limitations of the asserted claims of the '607 patent, once Motorola had successfully done so, the burden shifted to Apple to demonstrate that Perski '455 was not enabling. *See Impax Labs., Inc. v. Aventis Pharm., Inc.*, 545 F.3d 1312, 1316 (Fed. Cir. 2008). As the ALJ correctly found, Apple failed to do so.

Lastly, Apple argues that there is no evidence that the detection scheme disclosed in Perski '455 can "accurately" detect multiple touches. Apple Br. at 63-64. In its petition for review to the Commission, Apple raised this same issue, contending that Perski '455 criticizes the so-called "faster" approach it teaches as potentially producing "ambiguous and unsatisfactory multi-touch detection

results." A5139-40. Perski '455 describes this so-called "faster" approach as follows:

> A faster approach is to apply the signal to a group of conductors on one axis. A group can comprise any subset including all of the conductors in that axis, and look for a signal at each one of the conductors on the other axis. Subsequently, an input signal is applied to a group of lines on the second axis, and outputs are sought at each one of the conductors on the first axis. The method requires a maximum of n+m steps, and in the case in which the groups are the entire axis then the number of steps is two. *However, this method may lead to ambiguity on those rare occasions when multiple touches occur simultaneously at specific combinations of locations, and the larger the groups the greater is the scope for ambiguity*.

A16610(14:44-56) (emphasis added). The exact wording of this passage is important. Instead of describing this method as being unable to detect "distinct signals," Perski '455 describes that certain "rare occasions" may produce ambiguous results. This observation is hardly sufficient to constitute evidence sufficient to rebut Perski '455's disclosure of detecting multiple touches as different locations when the reference explicitly indicates that the disclosed method does just that. *See* A16610(14:15-19, 37-38). As the ALJ correctly noted, the fact that an anticipatory reference disparages a specific teaching is irrelevant so long as the reference does, in fact, disclose the limitation at issue. A186; *see Celeritas*, 150 F.3d at 1361 ("[a] reference is no less anticipatory if, after

disclosing the invention, the reference then disparages it.").

B. The ALJ Properly Found that Perski '455 is Prior Art to the '607 Patent

The ALJ properly found that Perski '455 is prior art to the '607 patent because it claims priority to Perski '808, which was filed on February 10, 2003, prior to the filing date of the '607 patent. A181. In challenging this finding, Apple argues that Perski '808 does not disclose a method for detecting multiple touches and that Perski '808 does not verbatim disclose certain language from Perski '455. As to this latter point, Apple highlights the disclosure in Perski '455 that "this method enables the detection of multiple finger touches. When an output signal is detected on more than one conductor that means more than one finger touch is present." Apple Br. at 65 (citing A16610(14:20-43)).

The disclosure of Perski '808, however, is just as clear on both of these points as is the Perski '455 reference itself. Specifically, Perski '808 discloses the following:

> Figure number 2 is a general description of the second finger detection method. An electric signal (1) is applied to a conductor line in a two-dimensional sensor matrix (2). A finger (3) that touches the sensor in certain position increases the capacitance between the applied line and the orthogonal line next to the touch position, and bypasses the signal from the source to the orthogonal conductor.

A16151 at ¶5, A16154(Fig. 2). Perski '808 further states that:

> The goal of the finger detection algorithm in this method, is to recognize all of the sensor matrix junctions that bypass signals due to external finger touch. It should be noted that this algorithm *is able to detect more than one finger touch at the same time*.

A16152 at ¶1 (emphasis added). Finally, Perski '808 goes on to describe the various detection methods taught in Perski '455, *e.g.*, the "direct" approach, the "faster" approach, and the "optimal" approach, in nearly as much detail as is given in Perski '455 itself. *Id*. Based on this disclosure in Perski '808, there can be no question that both it and Perski '455 disclose the "detect[ing] multiple touches . . . that occur at a same time" limitation of the asserted claims of the '607 patent.

As is apparent from the above quoted language in Perski '808, there can be no doubt that this earlier reference supports the disclosure in Perski '455 concerning the detection of multiple touches. Although the language used in the two references is not exactly identical, the relevant disclosure need not be verbatim in order for a reference to claim priority to an earlier publication. All that is required is that Perski '808 "contain[] adequate written description under 35 U.S.C. § 112" to support the disclosure in Perski '455. *See Star Scientific, Inc. v. R.J. Reynolds Tobacco Co.*, 655 F.3d 1364, 1371 (Fed. Cir. 2011). As detailed above, the evidence is overwhelming that Perski '808 provides the necessary

support to Perski '455.[7]

Because Perski '455 discloses all of the limitations of the asserted claims of the '607 patent and because it properly claims priority to Perski '808, the ALJ properly found that Perski '455 anticipates the asserted claims of the '607 patent.

III. THE COMMISSION CORRECTLY FOUND THAT THE ASSERTED CLAIMS OF THE '607 PATENT ARE INVALID AS OBVIOUS UNDER 35 U.S.C. § 103

A. The Prior Art Discloses All of the Limitations of the Asserted Claims of the '607 Patent

If the Court affirms the Commission's determination regarding anticipation, it need not reach the issue of whether the '607 patent is obvious in view of SmartSkin and Rekimoto '033. Nonetheless, if the Court reaches the question of obviousness, it should affirm the Commission's determination that the asserted claims of the '607 patent are obvious in view of the SmartSkin reference in combination with Rekimoto '033.

Apple expends a great amount of pages in its brief detailing the saga of Apple's development of the iPhone touchscreen. Apple, however, fails to discuss

[7] Apple claims that Motorola relied on Morag '662 for the limitation "output this information to a host device to form a pixilated image" in claim 10 of the '607 patent. Apple Br. at 66. Neither Apple nor its expert previously asserted this argument. As such, it is waived. *See Broadcom Corp. v. Int'l Trade Comm'n*, 542 F.3d 894, 900-1 (Fed. Cir. 2008) (declining to address argument not raised before the ALJ or the Commission).

the actual claims of the ’607 patent. Rather, Apple mistakenly compares the disclosure of the prior art, not to the claims of the asserted patent, but to that patent’s general disclosure. The correct comparison, however, is between the proffered prior art and the limitations of the claimed invention. *See Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1053 (Fed. Cir. 1988) (reversing a lower court’s finding of obviousness where the district court improperly compared the prior art to features of the asserted patent that were disclosed in the specification but not claimed, and further noting that “[t]his court has repeatedly held that it is the claims which define the invention.”).

Apple once again argues that the prior art does not teach “‘a touch panel having a transparent capacitive sensing medium’ that provided full image multi-touch.” Apple Br. at 40. The claims, however, are silent on the various features that Apple insists are necessary to make the claimed multi-touch touch panel operable.

In contending that the SmartSkin reference does not anticipate the claimed invention, Apple presents two general features of the touch screen disclosed in the ’607 patent. First, Apple argues that SmartSkin does not teach a solution for “the thorny problems” that arise from ITO’s high resistivity when compared to the copper wire system disclosed in SmartSkin. Apple Br. at 42. Specifically, Apple

asserts that using a charge counting sensor rather than a voltage counting sensor is the "brilliant" solution Apple came up with to solve this issue. *Id*. But, the asserted claims of the '607 patent do not recite this feature. Rather, the asserted claims focus primarily on the structural composition of the touch screen. *See* A561(21:35-22:60). The only claim that discloses a charge amplifier is unasserted claim 8, which recites: "[t]he touch panel as recited in claim 7, further comprising a virtual ground charge amplifier coupled to the touch panel for detecting the touches on the touch panel." *Id*.(22:17-19). Since claim 8 was not asserted, however, it is irrelevant to this appeal.

The fact that the asserted claims in the chain, independent claim 1 and its dependent claims 2-7, do not recite this limitation indicates that they are not so limited. *See InterDigital Commc'ns, LLC v. Int'l Trade Comm'n*, 690 F.3d 1318, 1324 (Fed. Cir. 2012) (finding that the presence of a limitation in a dependent claim indicates that the limitation is not present in the independent claim). The only other teaching regarding the charge counting sensor is discussed solely in the specification of the '607 patent in the context of a single embodiment. *See* A545(Figs. 12-13), A559(17:12-61). Given that the asserted claims recite only "a transparent capacitive sensing medium," the disclosure in SmartSkin concerning the use of ITO to fashion a transparent sensor reads on this limitation. *See*

A13603. Furthermore, Apple's expert, Dr. Subramanian, did not testify that a charge counting sensor is necessary, as Apple's counsel asserts. *see* Apple Br. at 50. Rather, Dr. Subramanian stated that using a charge counting sensor is "the way you ***can*** get there." A31784:2-11 ("[M]y point here is not to say that you ***need*** to have a charge counter.") (emphasis added).

Second, Apple argues that in the SmartSkin reference, "Sony [did not] teach how to make a display that a user could see through [using] multiple layers of ITO without the distracting grid of ITO strips." Apple Br. at 42. Again, neither do the asserted claims of the '607 patent. Apple contends that resolving this issue was critical to the transparency of the touchscreen. *Id*. According to Apple, it solved this problem by using non-conducting ITO to caulk the gaps. *Id*. The only claim that even remotely recites this feature is unasserted claim 11, which reads as follows:

> The display arrangement as recited in claim 10 further including dummy features disposed in the space between the parallel lines, the dummy features optically improving the visual appearance of the touch screen by more closely matching the optical index of the lines.

A561(22:56-60). Since this claim was not even asserted by Apple, again, it is irrelevant to this appeal. The only claims at issue – claims 1-7, and 10 – do not recite this feature, and are, therefore, not so limited. *See InterDigital*, 690 F.3d at

1324. The only other mention of this feature is in a single embodiment disclosed in the specification of the '607 patent. *See* A557-58(14:66-15:7). Given that the asserted claims recite only "a transparent capacitive sensing medium," the disclosure in SmartSkin concerning the use of ITO to fashion a transparent sensor reads on this limitation. *See* A13603.

Moreover, SmartSkin explicitly discloses the use of ITO to form a transparent sensor to be used with its multi-touch touch screen technology. A13603. In addition, the reference notes that most of the flat panel displays in use at the time of its publication, which predates the filing date of the '607 patent, "rely on active-matrix and transparent electrodes." *Id*. The reference further teaches that this common usage indicates that transparent electrodes "can be integrated with SmartSkin electrodes." *Id*. Buttressing the explicit statement in the reference itself, Motorola's expert, Dr. Wolfe testified that "[t]wo-layer sensors with rows and columns of ITO were standard products" at the time the application leading to the '607 patent was filed. A31533:11-22; *see also* A31451:14-A31452:5 (explaining that Figure 2 of SmartSkin would be sufficient to teach one of ordinary skill how to build a touch screen with a transparent sensor), A31534:20-A31535:8 (stating that he has been making ITO touch screen products since 1983). The Commission properly relied on this evidence in finding that SmartSkin, in

combination with Rekimoto, teaches all of the limitations of the invention claimed in the asserted claims of the ’607 patent. A511-12.

This conclusion is not altered by Apple’s insistence that the examiner at the U.S. Patent and Trademark Office “twice analyzed” the SmartSkin reference. Apple Br. at 40. In actuality, SmartSkin is present in the prosecution history only as one of many references listed in information disclosure statements submitted by the patent applicants. *See* A8839, A9938, A9961; *see also* A8937-44, A9268-75. The prosecution history, therefore, is inconclusive with respect to Apple’s argument.

B. Substantial Evidence Supports the ALJ’s Finding That Secondary Considerations Do Not Support a Finding of Non-Obviousness

As this Court has explained, “[o]bjective indicia may often be the most probative and cogent evidence of nonobviousness in the record.” *Catalina Lighting, Inc. v. Lamps Plus, Inc.,* 295 F.3d 1277, 1288 (Fed. Cir.2002) (internal citation omitted). However, secondary considerations, such as commercial success, will not necessarily dislodge a determination of obviousness based on an analysis of the prior art. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 426 (2007) (commercial success did not alter conclusion of obviousness). In any event, substantial evidence supports the ALJ’s findings that secondary considerations did not demonstrate non-obviousness.

The ALJ's finding that "the iPhone 4's commercial success was not enough to "overcome the strong showing of obviousness in this instance" is supported by substantial evidence. *See* A216-17. As the ALJ noted, "the evidence shows that the iPhone's success stems from other product characteristics such as its slim profile, light weight, good battery life, attractive design, easy to use software, and availability of numerous popular applications, songs and videos." A217 (citing A18187-89). Apple has numerous patents, each with multiple claims directed towards its touchscreen and iPhone technology. For example, the other patent at issue, the '828 patent, is also directed towards touch-screen technology. There is simply no evidence of how significant the invention claimed in the '607 patent above all of the other myriad features that go into the iPhone is to the iPhone's commercial success.

Similarly, Apple's assertion concerning praise for the touch screen claimed in the '607 patent is overstated. For instance, of the evidence Apple cites to in its brief (Apple Br. at 44-45), only one document even discusses multi-touch. *See* A7826-27. The other articles mention only the iPhone's touch screen in general, leaving the Commission, and this Court, to guess which specific feature is, in fact, being praised. For example, in the Time article calling the iPhone the "invention of the year," the article states that Apple did not "invent the touchscreen . . . [or]

reinvent it," speculating that "Apple probably acquired its much hyped multitouch technology when it snapped up a company called Fingerworks in 2005. A7483. The article never otherwise mentions the multi-touch aspect of the iPhone touch screen. A7483-84.

Also unavailing is Apple's reliance on copying. While Apple claims that Motorola attempted to imitate the iPhone's touchscreen, Apple fails to cite any evidence regarding which aspect of the invention Motorola was attempting to imitate. For instance, while one of the cited internal Motorola emails discusses [[ ]] as a problem Motorola was attempting to solve (A7498), this is not a feature that is even recited in any of the claims. Given the state of the evidentiary record, the Commission reasonably declined to find that secondary considerations were strong enough to warrant finding that the asserted claims of the '607 patent are not obvious.

Accordingly, if the Court addresses obviousness, it should affirm the Commission's finding that the asserted claims of the '607 patent are obvious in view of the SmartSkin reference combined with Rekimoto '033.

IV. THE ALJ CORRECTLY CONSTRUED THE LIMITATION "MATHEMATICALLY FIT[TING] AN ELLIPSE" IN CLAIMS 1 AND 10 OF THE '828 PATENT

The ALJ correctly construed the claim limitation "mathematically fit[ting]

an ellipse" as requiring "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." A70. In arguing otherwise, Apple contends that the ALJ acted contrary to the understanding of the parties and ignored the teaching of the written disclosure. Contrary to Apple's contention, however, Motorola did not agree that the limitation concerns merely calculating the five parameters of a standard ellipse. Rather, Motorola consistently argued before the ALJ that the meaning of the claim limitation "mathematically fit[ting] an ellipse" requires more than simply calculating parameters.

Motorola's expert, Dr. Wolfe, testified in his direct witness statement that:

> The modifier "mathematically" limits the particular ways in which a model ellipse can be constructed around a pixel group under claims 1 and 10. Specifically, the claim term "mathematically fitting an ellipse to at least one pixel group" requires that some kind of mathematical fitting algorithm based on some mathematical optimization (i.e. best fit) function be applied to a pixel group to construct a model ellipse and, if desired, obtain the parameters *of this model ellipse*.

A18256-57. During prosecution of the '828 patent, the applicants argued that Bisset '352 merely discloses "a series of capacitance values measured when a finger contacts a touchpad." A10453, A11920. Dr. Wolfe noted that the applicants distinguished Bisset '352 from the language of claim 1 of the '828

patent, which originally recited "fit[ting] an ellipse to . . . pixel groups," arguing that this process was different from "merely *obtaining* measured data." *Id.*; A18255-56; A10602. Moreover, at the urging of the PTO examiner, the applicants amended claim 1 to recite "mathematically fitting an ellipse." A11921. Furthermore, Dr. Wolfe testified that:

> [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.

A18256. Motorola repeated this argument in all of its briefing before the ALJ and before the Commission, thus clearly disputing Apple's proposed claim construction on more than simply the basis that the claimed "mathematical fitting" should be limited to a specific embodiment recited in the specification of the '828 patent. *See* A1175-76; A4474-75; A5269-75.

Moreover, the construction applied by the ALJ properly gives meaning to each word in the claim, *see* A63-64, and, therefore, deserves precedence over

Apple's proposed construction, which does not do so. *See Merck & Co. v. Teva Pharm. USA, Inc.*, 395 F.3d 1364, 1372 (Fed. Cir. 2005). Here, the claim limitations explicitly contain the phrase "mathematically fitted." As such, the ALJ properly took into consideration that his claim construction accounted for these terms.

Thus, the language of the claims themselves answers the 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, which both recite "mathematically fit[ting] an ellipse," 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, without mentioning the parameters that might result from such a process. A645(60:10-15, 49-52). By comparison, dependent claims 2 and 3 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* A645(60:16-22); *see also* A646(61:1-4, 8-12 (claims 11 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 recites 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." A645(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. A628(26:18-45). Therefore, even in this claim, the ellipse fitting occurs separately from deriving the ellipse parameters.

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." A586(Fig. 16), A622(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*." A625(19:1-2, 8-10) (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**. A588(Fig. 18), A627(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." A628(25:54-56). At first glance, it might arguably appear that this statement supports Apple's contention that the ellipse-fitting process consists of computing ellipse parameters. However, as Apple itself noted in it petition for review to the Commission (*see* A5106), in the preferred embodiment, at least two ellipse parameters (the x and y positions of the ellipse centroid) are derived before what the specification refers to as the preferred "ellipse fitting procedure" occurs. *See* A628(25:65-26:10, 26:18). This indicates 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 prosecution history of the '828 patent further supports the ALJ's construction of "mathematically fit[ting] an ellipse." During prosecution, the applicants argued that Bisset '352, under which the PTO examiner rejected their

claims, merely discloses "a series of capacitance values measured when a finger contacts a touchpad." A11920. The applicants distinguished Bisset '352 from the language of claim 1, which originally recited "fit[ting] an ellipse to . . . pixel groups," arguing that this process was different from "merely *obtaining* measured data." *Id*. Motorola's expert, Dr. Wolfe, confirmed that the original claim language, even without the addition of the term "mathematically," distinguished the claimed invention from Bisset. A18256; *see supra* at 53-54.

Apple criticizes the ALJ's construction as requiring drawing or fitting an ellipse first before measuring the parameters from that ellipse. *See* Apple Br. at 74. One of the named inventors, Dr. Elias, however, confirmed that this is precisely the correct interpretation, stating that:

> 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, you have two parameters of the equation of a 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.

A15493(195:23-196:20). Mr. Simmons, a senior Atmel software engineer, and Mr. Brown, a senior Google software engineer, testified consistently with this

interpretation that "mathematically fitting an ellipse would be the process of taking a disparate collection of points and then finding some kind of bounding ellipse that would contain them all and describe them." A31146:2-6; *see also* A15492-93(192-97) (describing the concept of "mathematically fitting" an ellipse to data); A18029 ("By 'shape fitting,' I mean code that would take touch data, which is generally irregular in shape, and define or 'fit' a particular mathematical shape to that touch data.").

As is apparent from the intrinsic evidence and corroborated by 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* A18062 ("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.").

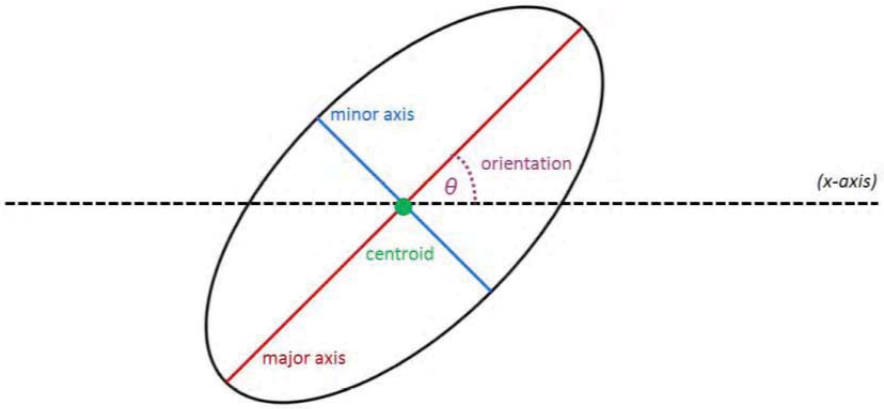
V. THE ALJ CORRECTLY FOUND THAT THE '828 ACCUSED PRODUCTS DO NOT INFRINGE THE ASSERTED CLAIMS OF THE '828 PATENT

Although Apple argues that resolution of the construction of the claim

limitation "mathematically fit[ting] an ellipse" in its favor will also result in finding of infringement, this is not the case. Rather, the evidence shows that, even under Apple's proposed construction, the '828 Accused Products do not infringe the asserted claims of the '828 patent. Specifically, [[ ]], and [[ ]] (for the Motorola Xoom (non-test build)) – [[ ]] in the '828 Accused Products are neither obtained as a result of fitting an ellipse to the pixel data, nor do they represent ellipse parameters.

Dr. Wolfe likewise testified that [[ ]], and [[ ]] (for the Motorola Xoom (non-test build)) – are [[ ]], rather than from any ellipse-fitting procedure. *See* A19275-80.

The evidence shows that none of [[ ]] represent ellipse parameters. It is undisputed that a minimum of five parameters are necessary to describe an ellipse, for example: (1) x-position of the centroid; (2) y-position of the centroid; (3) minor axis length; (4) major axis length; and (5) orientation angle:



A18058. The only values generated in the Accused '828 Products that correspond to these parameters are [[ ]], which represent [[ ]]. *See* A18028; A19283-84; A30656:23-A30657:12 (Balakrishnan). None of the other [[ ]] values relate to ellipse parameters.

Specifically, [[ ]]," determined by "[[ ]]." A19281. For instance, in the example below, the value [[ ]]

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]]

Id. The value of [[ ]] does not give any information about the size or the shape of the touch. *Id*. ("The [[ ]] has nothing to do with the shape of the touch and does not indicate the length, width, or radius."); A18028 (the "[[ ]]; it does not provide shape information. Touches of different shapes can therefore also have the same [[ ]] value."); *see* A30658:17-21 (Balakrishnan).

Similarly, the value of [[ ]]." A19282; A30660:19-24 (Balakrishnan) (Q. "[T]he way [to] figure out [[

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[[redacted]], correct?" A. "I believe so."). For instance, in the example below, the value [[redacted]

]]

A19282-83. The value of [[redacted]] does not give any information about the size or the shape of the touch. A19282 ("This calculation is independent of the shape, size, or orientation of the touch."); A18028 ("The [[redacted]], not its shape. As with [[redacted]], touches of different shapes can have the same

[[ ]] value."); *see* A30661:24-A30662:14 (Balakrishnan).

Likewise, in the Motorola Xoom (non-test build) products, the value

[[

]]

A19278. In the above example, [[

]]. A122. The [[ ]] value

would be [[ ]]. *Id.*[8] The value of [[ ]] does not give any information about the size or the shape of the touch. A19287 ("This calculation thus represents [[ ]] and not [[ ]]."); A18029 ("While [[ ]], they do not define the shape of a touch. And as with [[ ]], touches of different shapes can have the same [[ ]] values."); A30681:11-16 (Balakrishnan) (Q. "And [[ ]], correct." A. "The [[ ]].").

As discussed above, the evidence shows that [[ ]]." A134. Therefore, even under Apple's construction of the limitation "mathematically fit[ting] an ellipse," which requires calculation of ellipse parameters, there would be no infringement of the asserted claim of the '828 patent by the accused products. Neither has Apple shown that the '828 Accused Products

[8] The explanation for calculating the value of [[ ]] is given at A19287.

infringe claims 1 and 10 of the ’828 patent under the DOE. *See* A141-47.

Accordingly, if the Court disagrees with the Commission’s claim construction, it should nonetheless affirm the ALJ’s finding of non-infringement of the asserted claims of the ’828 patent.

CONCLUSION

For the foregoing reasons, the Court should affirm the Commission’s determination in all respects.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I, Andrea C. Casson, hereby certify on this 15th day of October 2012 that I am electronically filing the **NONCONFIDENTIAL BRIEF OF APPELLEE INTERNATIONAL TRADE COMMISSION** using the Court's CM/ECF system, which will send notification to the following:

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CERTIFICATE OF COMPLIANCE
PURSUANT TO FED. R. APP. P. 32(a)(7)(C)

Pursuant to Fed. R. App. P. 32(a)(7)(B), I hereby certify that the attached brief contains 13,931 words, according to the word-count function of the word-processing system used to prepare the brief (Microsoft Word 2010).

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Dated: October 15, 2012