EXHIBIT 3

CONTAINS CONFIDENTIAL BUSINESS INFORMATION

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C.

In the Matter of	
CERTAIN ELECTRONIC DEVICES WITH MULTI-TOUCH ENABLED TOUCHPADS AND TOUCHSCREENS	Inv. No. 337-TA-714

Order No. 17: Relating to Claim Construction

By notice dated April 23, 2010, the Commission instituted an investigation, pursuant to subsection (b) of section 337 of the Tariff Act of 1930, as amended, to determine (a) whether there is a violation of subsection (a)(1)(B) of section 337 in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain electronic devices with multi-touch enabled touchpads or touchscreens that infringe one or more of certain claims of U.S. Patent No. 5,825,352, ('352 patent) and whether an industry in the United States exists as required by subsection (a)(2) of section 337. The complaint was filed on behalf of Elan Microelectronics Corporation of Taiwan (Elan). Apple Inc. (Apple) was named in the notice of investigation as respondent.

Order No. 3, which issued on May 21, 2010, set a target date of August 29, 2011 and an evidentiary hearing for February 17, 18, 22, and 23, 2011.

A Markman hearing was conducted on August 18 and 19, 2010 with all parties participating. Per Agreement by all parties, post hearing submissions and reply submissions

were filed on September 3 and 10, respectively. The matter is now ready for an order.[1]

Claim construction involves the search for the ordinary and customary meaning of a claim term to a person of ordinary skill in the art at the application filing date of the patent in issue and begins with the language of the claims themselves. Phillips v. AWH Corp., 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (the claims are of primary importance in defining the invention); Interactive Gift Express, Inc. v. CompuServe, Inc., 256 F.3d 1353, 1331 (Fed. Cir. 2001.) Thus, unless compelled otherwise, a court should give a claim term the full range of its ordinary meaning as understood by a person of ordinary skill in the art. Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc., 381 F.3d 1111, 1118 (Fed. Cir. 2004); Phillips, 415 F.3d at 1324 (affirming the Innova approach.) Additionally, "other claims of the patent in question, both asserted and unasserted, can also be valuable sources of enlightenment as to the meaning of a claim term." Phillips, 415 F.3d at 1314 (citations omitted.) "Because claim terms are normally used consistently throughout the patent, the usage of a term in one claim can often illuminate the meaning of the same term in other claims." Id.

The meaning of claims may also be informed by the specification of the patent in issue, the prosecution history of said patent, and extrinsic evidence. Id. at 1314-19. Though not preferred over intrinsic evidence, id. at 1317:

> extrinsic evidence in the form of expert testimony can be useful to a court for a variety of purposes, such as to provide background on the technology . . . , to explain how an invention works, to ensure that the court's understanding of the technical aspects of the patent is consistent with that of a person of ordinary skill in the art, or to

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[1] On October 20, 2010, in Inv. No. 337-TA-703 the Commission issued a notice that a June 22, 2010 initial determination involving claim construction is an order rather than an initial determination.

> establish that a particular term in the patent or prior art has a particular meaning in the pertinent field.

Id. at 1318.

Extrinsic evidence however cannot be used "to vary or contradict the clear meaning" of claim terms dictated by the intrinsic record. Apex Inc. v. Raritan Computer, Inc., 325 F.3d 1364, 1371 (Fed. Cir. 2003.) Thus expert testimony cannot be at odds with the "claim construction mandated by the claims themselves, the written description, and the prosecution history, in other words, with the written record of the patent." Phillips, 415 F.3d at 1318 (citations omitted.)

In Conoco Inc. v. Energy & Envtl. Int'l, 460 F.3d 1349, 1362 (Fed. Cir. 2006), the question was whether a "stable" suspension of polymer required sufficient stability to remain suspended when stored for a long period of time, or just stability at the time the suspension was introduced into a pipeline. The Court determined from the intrinsic evidence that the appropriate frame of reference was stability at the time the suspension was introduced into the pipeline. The Court confirmed its interpretation against the extrinsic evidence, which indicated that all suspensions eventually separate, and found that the appropriate time frame for assessing stability was at the time the suspension was introduced into the pipeline.

In Tap Pharm. Produc., Inc. v. Owl Pharms., L.L.C., 419 F.3d 1346 (Fed. Cir. 2005), in issue were claims to a composition "comprising a copolymer . . . of lactic acid and . . . of glycolic acid." The question was whether the claims were limited to compositions resulting from a polymerization of lactic acid and glycolic acid, or whether the claims also covered the polymer resulting from cyclic precursors that transformed into lactic acid and glycolic acid during polymerization. The district court, which the Federal Circuit upheld, relied on treatises that

recognize that copolymers of lactic acid and glycolic acid can be made either by direct polymerization or by ring opening, and on expert testimony that a person of ordinary skill in the art would use the terms "lactic acid" and "glycolic acid" interchangeably with their cyclic analogs. Id. at 1349-50. In Mass. Inst. of Tech. v. Abacus Software, 462 F.3d 1344, (Fed. Cir. 2006) (Mass. Inst. of Tech.) there were claims to a "scanner," where the term "scanner" was not defined in the specification, which simply contained one illustrative embodiment having a moving scanner head. In issue was whether a digital camera qualified as a "scanner." The majority opinion of the Federal Circuit, in affirming the district court, stated:

> The district court . . . concluded that the "scanner" in claim 1(a) must involve placing the "'color' original' . . . on or in close proximity to the scanner." Here again the specification does not explicitly or implicitly define "scanner" as including a "close proximity" requirement. Although the single disclosed scanner in the specification includes this limitation, we do not confine the claim to the disclosed embodiments. Phillips, 415 F.3d at 1323. The pertinent dictionaries also offer no assistance.
>
> Under such circumstances, we must determine what meaning the term had in the relevant art at the time the patent issued by looking to other sources. This follows from our obligation to give the words of a claim "their ordinary and customary meaning, [which] . . . is the meaning that the [words] would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application. "Phillips, 415 F.3d at 1312-13 (internal quotation marks and citations omitted) . . . ; see also Markman v. Westview Instruments, Inc., 52 F.3d 967, 986 (Fed. Cir. 1995) (en banc), aff'd, 517 U.S. 370, 116 S. Ct. 1384, 134 L. Ed. 2d 577 (1996) (In construing claims, the courts focus on "what one of ordinary skill in the art at the time of the invention would have understood the term to mean."); Chisum on Patents § 18.03[2][g] (2003 ed.). In determining the meaning of a term within the pertinent art, it is appropriate to determine the mode of operation of the device at the time the patent application was filed. [Footnote omitted]

> Here, the district court (relying on the '919 specification, expert testimony, and technical references) concluded that in 1982 a person of ordinary skill in the art would have known of two general types of scanners, drum scanners and flatbed scanners. Both these scanners require close proximity between the color original and the scanner. We see no basis for disturbing this conclusion and agree that the term scanner should be defined by what was known in the art at the time. Plaintiffs argue that in 1982 cameras were scanners that did not require close proximity, but as we noted above, a camera that lacks the relative movement limitation is not a scanner. We conclude that the term scanner in 1982 should be construed to include a requirement of close proximity.

Id. at 1352-53 (emphasis added). As seen from the foregoing, the extrinsic evidence was consistent with the patentee's own description of the invention. Thus the extrinsic evidence tracked what the patentee had disclosed in the specification as being a scanner.

In Ortho-McNeil Pharm. Inc. v. Caraco Pharm. Labs Ltd., 476 F.3d 1321 (Fed. Cir. 2007), the Federal Circuit, in affirming the district court on claim construction considered the intrinsic and extrinsic evidence which consisted of expert testimony and found no error in the district court's construction of the term "about 1:5" to mean "about 1:5, which includes a ratio up to and including 1:7.1"

I. The '352 Patent In Issue

The '352 patent titled "Multiple Fingers Contact Sensing Method For Emulating Mouse Buttons and Mouse Operations On A Touch Sensor Pad" resulted from Application No. 608,116 that was filed on February 28, 1996 and issued as U.S. Patent No. 5,825,352 ('352 patent). (JX-1.)[2] Said application was a continuation of abandoned Application No. 582,768 filed January 4, 1996. The named inventors on the '352 patent are Stephen J. Bisset and Bernard Kasser. (JX-1).

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[2] See Appendix A for Table of Abbreviations.

The assignee on the '352 patent is Logitech, Inc. (JX-1.) On October 13, 2008 the '352 patent was assigned to complainant which was recorded on October 28, 2008. (Complaint Ex. 5 at 827-28.)

II. The Claims In Issue

Claims 1, 14 and 18 of the '352 patent,[3] which are the claims in issue, read:

> 1. A method for detecting the operative coupling of multiple fingers to a touch sensor involving the steps of
>
> > scanning the touch sensor to (a) identify a first maxima in a signal corresponding to a first finger, (b) identify a minima following the first maxima, (c) identify a second maxima in a signal corresponding to a second finger following said minima, and
> >
> > providing an indication of the simultaneous presence of two fingers in response to identification of said first and second maxima.
>
> 14. The method of claim 1 further comprising the step of:
>
> > selecting an appropriate control function based on a combination of a number of fingers detected, an amount of time said fingers are detected, and any movement of said fingers.
>
> 18. A touch sensor for detecting the operative coupling of multiple fingers comprising:
>
> > means for scanning the touch sensor to (a) identify a first maxima in a signal corresponding to a first finger, (b) identify a minima following the first maxima, and (c) identify a second maxima in a signal corresponding to a second finger following said minima, and

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[3] On October 28, 2010 the Commission issued a notice not to review an initial determination relating to Motion Nos. 714-4 and 714-7 for summary determination and finding each of claims 19, 24 and 30 of the '352 patent invalid. On October 28, 2010 also the Commission issued a notice which determined that Order No. 16 is an order rather than an initial determination. In Order No. 16, the administrative law judge found that complainant Elan is barred by collateral estoppel from arguing a different claim construction for asserted claims 1 and 18 than that found by a district court judge.

means for providing an indication of the simultaneous presence of two fingers in response to identification of said first and second maxima.

(JX-1 at 16:14-18:46.)

III. Claim Terms In Issue

1. Claims 1 and 18

a. "identify a first maxima in a signal corresponding to a first finger," "identify a minima following the first maxima," and "identify a second maxima in a signal corresponding to a second finger following said minima" (C Post at 8; R Post at 3; S Post at 2.)

b. "identify" (C Post at 13; R Post at 21; S Post at 3.)

c. "in response to" (C Post at 16; R Post at 23; S Supporting at 12.)

2. Claim 18

a. "means for scanning the touch sensor to (a) identify a first maxima in a signal corresponding to a first finger, (b) identify a minima following the first maxima, and (c) identify a second maxima in a signal corresponding to a second finger following said minima" (R Supporting at 3; S Post at 4.)

b. "means for providing an indication of the simultaneous presence of two fingers in response to identification of said first and second maxima" (C Post at 19; R Post at 30; S Post at 6.)

3. Claim 14

a. "control function" (C Post at 14; R Post at 24; S Post at 4.)

IV. Experts

Each of complainant Elan's expert Robert Dezmelyk and respondent Apple's expert Ravin Balakrishnan was qualified as an expert in the field of computer user input devices. (Tr. at 370-71.)

V. Skill Level Of One Of Ordinary Skill In The Art For The '352 Patent

Complainant Elan's expert, Dezmelyk, opined that one of ordinary skill would have had a bachelor's degree in electrical engineering or computer science or a similar technical degree, including course work in circuit design, and about three years of job experience with input devices. (Tr. at 183-184.) Respondent Apple's expert, Balakrishnan, opined that one of ordinary skill would have had education equivalent to a bachelor's degree in computer science, electrical engineering or mathematics and three to five years of job experience in signal processing and/or touch-sensitive input devices. (Tr. at 492-93.) Respondent Apple's expert, Balakrishnan, opined that the key difference between these opinions was that respondent required only experience in "signal processing or human-computer interaction" whereas complainant required specific training in touch-sensitive input devices. (Tr. at 497-98.)

The administrative law judge finds that the skill level of one of ordinary skill in the art for the '352 patent is education equivalent to a bachelor's degree in computer science, electrical engineering, or a similar technical degree, and three years of experience in touch-sensitive input devices.

VI. Claim Terms

1. "identify a first maxima in a signal corresponding to a first finger," "identify a minima following the first maxima," and "identify a second maxima in a signal corresponding to a second finger following said minima" (Claims 1 and 18)

Claim Term	Complainant's Construction	Respondent's Construction	Staff's Construction
identify a first maxima in a signal corresponding to a first finger	"Identify a first peak value in a finger profile taken on a straight line obtained from scanning the touch sensor."	"Identify a first peak value in a finger profile taken on a straight line obtained from scanning the touch sensor."	"Identify a first peak value in a finger profile taken on a straight line obtained from scanning the touch sensor."
identify a minima following the first maxima	"Identify the lowest value in the finger profile taken on a straight line that occurs after the first peak value."	"Identify the lowest value in the finger profile taken on said straight line that occurs after the first peak value, and before another peak value is identified."	"Identify the lowest value in the finger profile taken on said straight line that occurs after the first peak value, and before another peak value is identified."
identify a second maxima in a signal corresponding to a second finger following said minima	"Identify a second peak value in the finger profile taken on a straight line following the minima."	"After identifying the lowest value in the finger profile taken on said straight line, identify a second peak value in the finger profile taken on said straight line."	"After identifying the lowest value in the finger profile taken on said straight line, identify a second peak value in the finger profile taken on said straight line."

(C Post at 9; R Post at 11; S Post at 2.)

Complainant, in support of its construction, argued that "there is no requirement that the steps of identifying the first maxima, the minima and the second maxima occur in that order." (C Post at 9.) It is argued that claims are not normally construed to require an order (Id. at 10), and there is no clear language in the claims nor clear statement in the specification that imposes such

an order (Id. at 9). Complainant also argued that the term "following" carries meaning only in the spatial sense, and not the temporal sense. (C Supporting at 13.)

Respondent, in support of its construction, argued that the claim language imposes a temporal requirement by referring back to "first maxima" and the "said minima" within steps (b) and (c), respectively. (R Post at 15.) Respondent also argued that every embodiment in the specification "shows the identification of first a maximum, then a minimum, and then another maximum in that order." (Id.) Respondent agreed with complainant that the claims include a spatial requirement. (R Supporting at 24.)

The staff, in support of respondent Apple's proposed construction, argued that the plain language of the claim requires that the steps be performed sequentially in time. (S Supporting at 10.)

The private parties agree that the test in Interactive Gift Express, Inc. v. Compuserve Inc., 256 F.3d 1323, (Fed. Cir. 2001) (Interactive Gift) applies. (C Post at 10; R Supporting at 32-33.) Interactive Gift says that a temporal order is only to be imposed when required by either the "logic or grammar" of the claims or by the language of the specification. (See Taltech Ltd. v. Esquel Apparel, Inc., 279 Fed. Appx. 974, 978 (Fed. Cir. 2008) see also Interactive Gift, 256 F.3d at 1342-43.)

Claims 1 and 18 cite a method and means, respectively, of:

> scanning the touch sensor to (a) identify a first maxima in a signal corresponding to a first finger, (b) identify a minima following the first maxima, (c) identify a second maxima in a signal corresponding to a second finger following said minima

(JX-1 at 16:16-20, 17:30-34.) The plain language of element (a), supra, requires identification of

a first maxima, and the plain language of element (b), supra, requires identification of a minima following the first maxima. Moreover because element (b) calls for "the first maxima" it refers back to the same "first maxima" identified in element (a). (Balakrishnan, Tr. at 503:9-15.) Thus the grammar carries logical meaning only if "the first maxima" has already been identified. Further, element (c), supra, requires identification of a "second maxima" which is "following said minima." The plain language of the "said minima" of element (c) refers back to the minima that was previously identified in element (b). (Balakrishnan, Tr. at 503:16-21.) Therefore the administrative law judge finds that the language of the claim requires one to identify a first maxima before identifying a minima following said first maxima, and to identify said minima before identifying a second maxima following said minima. (See Balakrishnan, Tr. at 515:13-24.) Hence he finds that one of ordinary skill in the art would understand the language of claims 1 and 18 to require that elements (a), (b), and (c) be performed in sequential order.

Referring to the specification of the '352 patent, the specification teaches:

> In general, the function of the Xcompute and Ycompute processes is simply to evaluate the current measurements by calculating the centroid of the finger measurement, and by detecting whether a second finger is touching the pad.

(JX-1 at 7:43-47, emphasis added.) Figure 6 of the '352 Patent is a flow diagram for Xcompute. (JX-1 at 8:46-48.) Also, "[t]he algorithm for Xcompute starts at step 200, followed by initialization of variables at step 205." (JX-1 at 9:18-19.) The specification further describes the process of identifying a maximum, a minimum, and a maximum using the terms "peak" and "valley." (See, e.g. JX-1 at 9:53, 57.) The private parties and the staff have agreed that these terms are equivalent to "maximum" and "minimum." (Tr. at 88:19-90:18.) In addition, this

identification process occurs in an "algorithm or snippet of code" (Balakrishnan, Tr. at 505:9) which will "march through [the] finger profile" (Balakrishnan, Tr. at 504:14-15) in a sequence (Balakrishnan, Tr. at 506:3-4.) Also the specification describes this process as follows:

> The XLoop continues at step 225, where one of a series of subloops is selected depending on the value of Xstate. Since Xstate is initially set to Peak1, the first subloop entered is the Peak1 subloop, beginning at step 230. At step 230 the value of X(N) is compared to the value of X(N-1) and, if X(N) is greater than or equal to the value of X(N-1), the first peak has not yet been reached . . .
>
> At some value of N the value of X(N) is less than the value of X(N-1), at which point the check at step 230 yields a NO. At this point, the peak has been found and at step 232 the value of Xpeak1 is set to X(N-1) and the value of Xstate is set to Valley . . .

(JX-1 at 9:39-45, 51-55, emphasis added.) X(N) and X(N-1) refer to values of finger-induced sensor conductor capacitance on the touch sensor. (JX-1 at 8:56-60.) The values from X(1) to X(Xcon) correspond to the first and last conductors. (JX-1 at 9:24-29.) The parties have agreed that said values refer to those in a "finger profile taken on a straight line." (C Post at 8; R Post at 12; S Post at 2.) Thus the specification teaches that the algorithm will identify the first peak by incrementally stepping across the finger profile while analyzing each capacitance value until it encounters a value smaller than the preceding one. The algorithm then labels said preceding value as Xpeak1 to identify it as a peak. The algorithm then begins to search for a valley. The specification continues:

> At step 255 a X(N) is compared to X(N-1). If X(N-1) is not greater than or equal to X(N), the valley has not yet been found, causing a further jump to step 235 and a repeat with an incrementally higher N. If a second finger is touching the pad then eventually the value of X(N-1) will be greater than or equal to the value of X(N), such that the valley is detected. At this point, at step 262, the value of

> Xvalley is set to X(N-1) and Xstate is set to Peak2 . . .
>
> On the next cycle . . . [a]t step 270 the state of Xstate is compared to Peak2, and a YES result will occur. This results in a compare between X(N) and X(N-1) at step 275, to look for a second peak.

(JX-1 at 9:65-10:5, emphasis added.) The algorithm continues its step-by-step analysis until it finds a point larger than the previous point. At that point step 262 is performed, which identifies a valley and prepares to begin to look for a second peak. Step 262 occurs after the first peak value has been identified in step 232. Further, step 262 also occurs before another peak value has been identified because it prepares to look for the second peak by setting Xstate to Peak2. Doing so results in the algorithm moving to step 275 on the next cycle in order to look for a second peak. Both complainant Elan's expert Dezmelyk and respondent Apple's expert Balakrishnan testified that the sequence of identifying the first maxima, then the minima following the first max is the only sequence disclosed in the '352 patent. (Tr. at 479:8-16, 504:4-9.) Thus the administrative law judge finds that one of ordinary skill in the art would understand that the specification requires the claimed invention to identify a first peak, then to identify a minima following the first peak, and then to identify a second peak following said minima.

Based on the foregoing, the administrative law judge finds (1) that the disputed claim term "identify a first maxima in a signal corresponding to a first finger" means identify a first peak value in a finger profile taken on a straight line obtained from scanning the touch sensor, (2) that the disputed claim term "identify a minima following the first maxima" means identify the lowest value in the finger profile taken on said straight line that occurs after the first peak value, and before another peak value is identified, and (3) that the disputed claim term "identify a second maxima in a signal corresponding to a second finger following said minima" means after

identifying the lowest value in the finger profile taken on said straight line, identify a second peak value in the finger profile taken on said straight line. The administrative law judge also finds that claims 1 and 18 include a temporal requirement to identify the first maxima, then later in time identify the minima following the first maxima, and still later in time identify the second maxima following said minima.

Complainant Elan's expert was asked how could a person of ordinary skill in the art (1) identify "a minima following the first maxima" without first identifying said first maxima, and (2) identify "a second maxima following said minima," without first identifying said first maxima and said minima? (Dezmelyk, Tr. at 449:19-450:2.) In response he testified that one could first identify all of the maxima, and then identify a minima in between them. (Tr. at 450:19-451:10.) However the claim language requires identifying a second maxima which follows the "minima following the first maxima." Therefore if one first identified all of the maxima in the finger profile, one would not have identified a "second maxima . . . following said minima" as required by claim 18 because one does not yet know the location of the said minima. Thus, to determine which of the maxima in the finger profile is the claimed "second maxima . . . following said minima" one must first identify the said minima.

Complainant Elan's post-hearing brief contains unsupported statements regarding the testimony of respondent Apple's expert. For instance, complainant asserted:

> Dr. Balakrishnan testified that, as a matter of grammar and logic, the claims may be satisfied without performing the steps in the order recited in the claims.

(C Post at 11.) Complainant also asserted:

> Dr. Balakrishnan effectively admitted that the claim language

> would be understood by one of ordinary skill in the art to encompass methods where the steps are not performed in the recited order.

(C Post at 9-10.) Complainant further argued:

> Dr. Balakrishnan also admitted that a method that first identified two maxima in that matrix of data, and then identified the intervening minima, would meet the requirements of the claim as written.

(C Post at 11.) In making these statements, complainant failed to cite to any portion of the record to support this alleged testimony. The administrative law judge has not been able to find any support for said statements in the record. Respondent Apple said that these statements were "grossly inaccurate," and cited the following testimony in support:

> Q. Dr. Balakrishnan, I would like to simply pick up with the extended hypothetical that Mr. DeBruine asked you about making an assumption that there were two local maxima, and then after those were found, then a line was drawn between those maxima and then after that, a minima was found. Do you have that in mind?
>
> A. Yes, I do.
>
> Q. Does that hypothetical have anything to do with the claimed inventions in claim 1 and 18 of the '352 patent?
>
> A. No.

(R Reply at 13; Tr. at 541:11-23.) Complainant is reminded of Commission Rule 210.4(c)(3):

> By presenting to the presiding administrative law judge or the Commission (whether by signing, filing, submitting, or later advocating) a pleading, written motion, or other paper, an attorney or unrepresented party or proposed party is certifying that to the best of the person's knowledge, information, and belief, formed after an inquiry reasonable under the circumstances—
> . . .

(3) The allegations and other factual contentions have evidentiary support.

Complainant Elan also argued that the issue presented in this investigation is similar to the issue in Kemin Foods v. Pigmentos Vegetales del Centro, 301 F. Supp. 2d 970, 993 (S.D. Iowa, 2004.) (Kemin) where the court held that steps (a) and (b) of the claimed process could be performed in either order. The claim at issue in Kemin contained step (a) calling for preparation of a homogenous liquid by combining two ingredients and step (b) calling for addition of a third ingredient "with said homogenous liquid." (U.S. Patent No. 5,648,564 at 8:65-9:11.) The court found that while step (b) referenced the mixture produced by combining the two ingredients of step (a), these two steps were interchangeable with no significant difference in the end result. (Kemin, 301 F. Supp. at 993.) However, in this investigation the administrative law judge has found, supra, that the claimed process cannot be executed by changing the order of the steps.

Complainant Elan further argued that 3M Innovative Properties Co. v. Avery Dennison Corp., 350 F.3d 1365, 1371 (Fed. Cir. 2003) (3M) requires that the terms "first" and "said" to refer to repetitions of the same claim element does not indicate restriction to a particular order. (C Post at 10.) However complainant has misstated the 3M case. Regarding claim language the court in 3M said:

> In the context of claim 1, the use of the terms "first ... pattern" and "second ... pattern" is equivalent to a reference to "pattern A" and "pattern B," and should not in and of itself impose a serial or temporal limitation onto claim 1.

(3M, 350 F. 3d at 1371.) Thus 3M does not prevent the administrative law judge from relying on claim language that refers back to prior completed steps. Further in 3M the court found that "nothing in the intrinsic evidence of the patent requires . . . a limitation of sequential creation"

but rather that the specification clearly defined the disputed term in a manner "devoid of sequential limitation." (Id. at 1372) However in this investigation the administrative law judge has found, supra, that all the evidence in the specification supports a temporal order requirement. Finally, the 3M court relied in part on a broadening amendment during prosecution, which has not been found here. (Id.)

Complainant Elan also argued that the order of the steps are not important. (C Supporting at 14.) Complainant relied on a statement in the specification that "sensors can be scanned sequentially or concurrently, depending on the hardware implementation." (Id., citing JX-1 at 7:36-37. However the surrounding text in the specification states:

> Referring still to FIG. 5, the cyclical process begins at step 400, and continues at step 410 by scanning the conductor sensors. The sensors may be scanned sequentially or concurrently, depending on the hardware implementation. The scan process measures the values of finger-induced capacitance for each of the conductors, and stores the values in RAM at step 420. The cycle process continues by performing the Xcompute loop of FIG. 6 discussed hereinafter, and also the Ycompute loop analogous to FIG. 6, at step 430 and 440, respectively.

(JX-1 at 7:34-43, emphasis added.) Thus the scan process occurs in steps 410 and 420 and includes scanning the conductor sensors and measuring and storing the values of capacitance. In contrast identification of maxima and minima is part of the Xcompute and Ycompute loops, which occur in steps 430 and 440, respectively.

Complainant Elan, in arguing that the order of the steps are not important, also relied on the following in the specification:

> [T]he X and Y compute processes may be performed sequentially in either order or concurrently.

(JX-1 at 11:6-10; C Supporting at 14.) Varying the order of the execution of the X and Y compute processes, however, is not inconsistent with the claim construction put forth by respondent Apple and the staff. As found supra, the Xcompute loop in Figure 6-1 contains all the steps to analyze a finger profile to identify a first maxima, then a minima following the first maxima, and then a second maxima following said minima. Therefore choosing to execute the Xcompute loop after the Ycompute loop will not change the order in which the maxima and minima are identified. This passage means that the identification of these maxima and minima "can be done either for the X axis first, followed by the Y axis, or the other way around, or both of those could be done at the same time." (Balakrishnan, Tr. at 509:14-17.)

2. "control function" (Claims 1 and 18)

Complainant's Construction	Respondent's Construction	Staff's Construction
A function in response to contact with the touchpad other than or in addition to movement of the cursor	Function that would normally be provided by the actuation of buttons or switches on a mouse	Function that would normally be provided by the actuation of buttons or switches on a mouse

(C Post at 14; R Post at 24; S Post at 4.)

Complainant Elan did not submit a claim construction for "control function" in its motion for summary determination on claim construction. (Tr. at 679:5-15.) Complainant argued that respondent Apple's proposed construction is unduly narrow (C Post Reply at 10) and that "control function" is not limited to those functions associated with a computer mouse (C Opposing at 36).

Respondent Apple, in support of its construction, argued that the claim language,

specification, and prosecution history show that "control function" should be construed in terms of functions normally provided by a traditional mouse. (R Supporting at 44.) Respondent Apple further argues that complainant Elan's position would claim any function that does more than just move the cursor. (Id.)

The staff, in support of respondent Apple's proposed construction, argued that because the title of the patent is "Multiple Fingers Contact Sensing Method for Emulating Mouse Buttons and Mouse Operations on a Touch Screen Pad" therefore the invention is limited to emulating mouse buttons. (JX-1; S Supporting at 13.) The staff argued that this conclusion is further supported because the language pertaining to a computer mouse was added during prosecution to clarify the purpose of the invention. (S Supporting at 13.) Finally, the staff argued that the specification supports its construction by defining "the present invention" as one finger controlling movement of the cursor, and the second finger as controlling functions equivalent to a mouse button or switch. (Id.)

The term "control function" is found in claims 14 and 19, which depend on claim 1 and claim 18, respectively. (JX-1 at 17.) Claims 14 and 19 recite a method and a means, respectively (JX-1 at 17:10-15, 38-42.) Rewritten in independent form claim 14 reads:

> A method for
> detecting the operative coupling of multiple fingers to a touch sensor involving the steps of scanning the touch sensor to (a) identify a first maxima in a signal corresponding to a first finger, (b) identify a minima following the first maxima, (c) identify a second maxima in a signal corresponding to a second finger following said minima,
> and providing an indication of the simultaneous presence of two fingers in response to identification of said first and second maxima . . .
> [and] selecting an appropriate control function based on a

> combination of a number of fingers detected, an amount of time said fingers are detected, and any movement of said fingers.

(JX-1 at 16-17 (emphasis added).) The claim language defines "control function" only by stating the criteria used to select said function. Thus, as claims 14 and 19 depend on claims 1 and 18, respectively, the selection of a control function must be done after "detecting the operative coupling of multiple fingers to a touch sensor." (JX-1 at 14-15.) Claims 14 and 19 have no dependent claims that further define a control function. Other claims that are dependent on claims 1 and 18 mention types of functions. Claims 3, 11 and 25 recite a "drag" function. (JX-1 at 16:27-29, 61-63, 18:17-21.) Claims 2, 12 and 26 recite a "click" function. (JX-1 at 16:24-26, 64-67, 18:21-24.) Claims 13 and 27 recite a "cursor" function. (JX-1 at 17:6-7, 18:31-32.) These functions are examples of control functions that one could perform with a mouse. (JX-1 at 1:48-56 ("click and drag function" can be done with a mouse), 62-65 (cursor movement and clicks can be done with a mouse.) Based on the claim language the administrative law judge therefore finds that one of ordinary skill in the art would understand the claim term "control function" to include conventional mouse functions. However, the administrative law judge finds nothing in the claim language that would include or exclude additional functions.

The specification also supports including conventional mouse functions as examples of a "control function." The '352 patent frequently describes the invention in terms of "conventional" mouse functions:

> For clarity of explanation, the present invention can be described in most of its applications by establishing one finger as controlling movement of the cursor, and the second finger as controlling functions equivalent to a mouse button or switch. In this context, one finger may be considered the "point" finger, while the other is the "click" finger. Various conventional functions may

then be defined accordingly.

(JX-1 at 2:56-62 (emphasis added).)

> As noted previously, the second or additional fingers are typically involved to provide "button" or control functions, similar to actuation of the buttons or switches on a mouse.

(JX-1 at 6:50-53.) Thus the term "control function" may include functions normally provided by buttons or switches on a mouse. However by the use of the terms "most of its applications" and "typically" the patent contemplates functions other than mouse button functions. Other portions of the specification also describe conventional mouse functions within the operation of the invention, but without indicating whether other functions might also be included:

> Combinations of the first, second, and perhaps additional fingers can then enable numerous conventional functions to be performed based on the mapping of a variety of sequences of taps or finger movements to a set of conventional pointing device functions, where the pointing device could be a touchpad, mouse, trackball, joystick, or stylus, for example.

(JX-1 at 11:56-11:65 (emphasis added).)

> Similarly, tapping with both fingers at the same time may be defined as an alternate, shorthand method for a double tap (such as may be defined for the middle button in a Logitech mouse) or may be defined as a special function, similar to the "right button" functions of a mouse.

(JX-1 at 3:26-31 (emphasis added).)

> A still further object of the present invention is to provide a method for effecting on a touchpad, through the use of multiple finger contacts, a plurality of conventional mouse button functions.

(JX-1 at 4:36-39.)

The specification teaches that the '352 invention can also perform "additional" or

"enhanced" functions:

> In addition to the foregoing functions, which can be performed (albeit awkwardly and less intuitively) with conventional touch pads, there are additional functions that can be performed with two fingers and which can have substantial analogs to the use of a mouse or even go beyond conventional mouse functions.

(JX-1 at 3:16-21 (emphasis added).)

> Yet another object of the present invention is to provide a method and apparatus for effecting on a touchpad, through the use of multiple finger contacts, a plurality of enhanced functions.

(JX-1 at 4:40-43 (emphasis added).) In addition to these general statements regarding non-mouse functions, the specification also provides particular examples of such additional functions:

> For example, detection and location of two fingers will permit the touchpad to report to a host system the distance between the two fingers. This can be used, for example, in paint or other programs to determine line width or other spacing functions, or any other "variable value" function.

(JX-1 at 3:21-26 (emphasis added).)

> Another function which may be implemented with two finger detection is "drag lock."

(JX-1 at 3:37-38.)

> Also included within the present invention is the detection and location of more than two fingers, with accompanying functional definitions permitting such multiple contacts to indicate pointing device or other control operations, such as musical keyboards.

(JX-1 at 4:12-16.)

Thus the specification affirms that other functions are included within the scope of the invention in addition to conventional mouse functions. Therefore the administrative law judge

finds that the specification would disclose to one of ordinary skill in the art that the claim term "control function" includes both conventional mouse functions and other non-mouse functions.

Claims 14 and 19 issued from claims 34 and 36 in the prosecution history. (See JX-2 at 471.) On December 5, 1997 the Examiner rejected these claims as obvious in view of U.S. Patent No. 5,495,077 by Miller et al. (Miller). (JX-2 at 478.) The Examiner stated that mouse functions such as pointing device, drag, select ink function, removal and replacement of maxima and reaching the edge are common, and that Miller's apparatus can be used as a mouse (column 2, lines 1-10) therefore such functions would be obvious. (JX-2 at 478.) On April 6, 1998 and in response to this office action the patentee did not cancel or amend the claims, but argued that "[t]he present invention uniquely utilizes the detection of two maxima to determine if two fingers are present on the touchpad. (JX-2 at 533.) A telephone conference between the patentee and the Examiner occurred on May 6, 1998 (JX-2 at 649) after which claims 34 and 36 were allowed and renumbered to claims 14 and 19 (JX-2 at 652). The administrative law judge finds nothing in this process which would limit the claim term "control function" to functions normally performed by a mouse.

Based on the foregoing, the administrative law judge finds that one of ordinary skill in the art would understand the claim term "control function" to mean any function executed in response to the operative coupling of multiple fingers on a touch sensor.

Respondent Apple and the staff argued that the prosecution history shows that the claim term "control function" is limited to functions normally performed by buttons on a mouse. (R Supporting at 44, S Supporting at 13.) Respondent Apple and the staff, in support of this argument, reference the change in title of the '352 Patent during prosecution. (R Supporting at

46; S Supporting at 13.) The '352 Patent was originally entitled "Multi-Contact Sensing Method and Apparatus." (JX-2 at 7.) In an office action dated April 18, 1997, the examiner stated:

> The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. An example of a more descriptive title would be "A Multiple Fingers Contact Sensing Method for Emulating Mouse Buttons and Mouse Operations on a Display Touch Sensor Pad."

(JX-2 at 50.) In response the patentee amended the title to "A Multiple Fingers Contact Sensing Method for Emulating Mouse Buttons and Mouse Operations on a Touch Sensor Pad." (JX-2 at 467.) The administrative law judge finds that the change of title supports including mouse functions as examples of a "control function" but it does not support excluding other functions.

Respondent Apple also argued that the following portion of the prosecution history shows that the term "control function" is limited to mouse functions. (R Supporting at 46.)

> The steps of claim 23 relating to using the first finger for cursive movement and a second finger for a control function is discussed, for example, on page 8, lines 31-38.

(JX-2 at 474 (emphasis added).) The portion of the specification that the patentee referred to reads:

> To operate effectively, the present invention must detect and distinguish the presence of a single finger, and the presence of multiple fingers. As noted previously, the second or additional fingers are typically involved to provide 'button' or control functions, similar to actuation of the buttons or switches on a mouse. Although the following example describes in detail the use of only two fingers, one for cursor control and a second as a button, the teachings herein are believed sufficient to permit those skilled in the art to construct apparatus using multiple fingers for additional buttons.

(JX-2 at 14:31-38; JX-1 at 6:48-58.) The administrative law judge finds that by using the terms

"for example" and "typically" the patentee demonstrates that mouse button functions are one common example of a "control function" without excluding other embodiments.

Complainant Elan has proposed that "control function" excludes cursor movement. (C Post at 14.) The prosecution history, however, shows that the patentee understood the claim term to include both mouse button functions and cursor movement. Claims 20 and 23 of the application claimed in part:

> 20. A method for detecting the operative coupling and decoupling of multiple fingers to a touch sensor to perform cursor movement or control functions involving the steps of detecting the operative coupling of at least two objects such as two fingers to a sensor . . . and reporting to a host signals for causing cursor movement or control functions as a result of the evaluation. (JX-2 at 29 (emphasis added).)
>
> 23. A method for detecting the operative coupling and decoupling of multiple fingers to a touch sensor to perform cursor movement or control functions involving the steps of detecting operating coupling of a first group of objects with a sensor . . . detecting the operative coupling of a second group of objects with a sensor, wherein the number of objects in the second group is different from the number of objects in the first group . . . and reporting to a host signals for causing cursor movement or control functions . . ."

(JX-2 at 29-30 (emphasis added).) On April 18, 1997 the examiner rejected these claims as indefinite for using the word "or." (JX-2 at 49-50.) The patentee responded by deleting the phrase "cursor movement or" from claims 20 and 23, and adding claim 24 for "[t]he method of claim 20 wherein said control function comprises a cursor movement." (JX-2 at 468-69.) The patentee remarked:

> In particular, claim 20 specifies a control function, which could be a cursor movement, click, etc. Claim 24 further specifies the control function is in a particular embodiment a cursor movement.

(JX-2 at 473-74 (emphasis added).) Thus the patentee understood "control function" to include cursor movement as a particular embodiment.

On December 5, 1997 the examiner rejected claims 20 and 24 as being anticipated by U.S. Patent No. 4,914,624 (Dunthorn). (JX-2 at 479.) Specifically, the examiner stated that Dunthorn shows the control function comprises a cursor movement. (JX-2 at 479, Dunthorn at 2:28-47.) In response, the patentee cancelled these claims. (JX-2 at 536, 649.)

Respondent Apple argued that the claim construction proposed by Complainant Elan is inappropriately overbroad, and provides no actual guidance to those of skill in the art as to the scope of the term "control function." (R Post Reply at 25.) However this argument, if true, would affect claim validity under the written description and enablement requirements but is not properly addressed during claim construction. As the Federal Circuit has stated:

> While we have acknowledged the maxim that claims should be construed to preserve their validity, we have not applied that principle broadly, and we have certainly not endorsed a regime in which validity analysis is a regular component of claim construction. Instead, we have limited the maxim to cases in which "the court concludes, after applying all the available tools of claim construction, that the claim is still ambiguous."

(Phillips v. AWH Corp., 415 F.3d 1303 (Fed. Cir. 2005).) The administrative law judge finds that in regards to the claim term "control function," no additional clarity can be gained by construing the claim in an attempt to preserve validity.

3. "in response to" (Claims 1 and 18)

Complainant's Construction	Respondent's Construction	Staff's Construction
plain meaning	"after and in reaction to"	"after and in reaction to"

(C Post at 16; R Post at 23; S Supporting at 12.)

Complainant Elan, in support of its proposed construction, argued that "response" is a common English word and that the phrase needs no construction. (C Post at 16.) Complainant further argued that "the identification of two maxima is a factor considered in the process of providing the indication of two fingers" but not the only factor. (C Opposing at 35.) Complainant also argued that respondent Apple's construction, by requiring the response to occur immediately after identification with no intervening steps, would not cover the preferred embodiment. (Id.)

Respondent Apple, in support of its proposed construction, argued that it is the recognition of the two maxima which determines that two fingers are present. (R Supporting at 42.) Respondent Apple further argued that complainant Elan's construction is intended to allow "indication" to occur based on something other than the identification of two maxima. (R Supporting at 42.)

The staff, in support of Apple's proposed construction, argued that it is consistent with a dictionary definition for "response" as "a reply or answer." (S Supporting at 12.) The staff further argued that other definitions for "response" or "respond" connote a subsequent action in reaction to a previous action. (S Supporting at 12.)

The parties' dispute therefore has two aspects. First, the parties dispute whether the

"indication of the simultaneous presence of two fingers" must occur immediately after "identification of said first and second maxima" or if it could also occur after additional steps are executed. (JX-1 at 16:21-23.) Second, the parties dispute whether said identification must be the only factor used in triggering said indication, or if additional factors may also be considered.

Claims 1 and 18 cite a method and means, respectively, of:

> scanning the touch sensor to (a) identify a first maxima in a signal corresponding to a first finger, (b) identify a minima following the first maxima, (c) identify a second maxima in a signal corresponding to a second finger following said minima, and providing an indication of the simultaneous presence of two fingers in response to identification of said first and second maxima.

(JX-1 at 16:15-23 (emphasis added).) The claim language instructs to first scan the touch sensor to identify a first and second maxima; then, in response to identification of said first and second maxima, to provide an indication of the simultaneous presence of two fingers. While the claim language states that the "indication" is in response to the "identification" and is listed as the next step, the claim does not affirmatively exclude intermediate steps between the "identification" and "indication" steps.

Thus, the administrative law judge finds that one of ordinary skill in the art would understand from the claim language that the claim term "in response to" means that the indication step must occur after the identification step, and that the indication step must occur because of the "identification of said first and second maxima." The administrative law judge further finds that the claim language does not indicate whether any other events may occur between the identification and indication steps.

Figures 9-1 and 9-2 demonstrate the process of identification and indication. (JX-1 at Fig.

9-1, 9-2.) The first peak has been found after step 230 yields a "NO" response, "and at step 232 the value of Xpeak1 is set." (JX-1 at 9:52-54.) Similarly, after step 275 yields a "NO" response, step 278 sets the value of Xpeak2. (JX-1 at 10:19-21.) As found, supra, setting the value of Xpeak1 and Xpeak2 is the "identify" step for those respective maxima. Multiple steps then occur before the indication step, including cycling through the measurements until N equals Xcon at step 235 (JX-1 at 10:26-30), comparing Xpeak1 and Xpeak2 to the threshold value at step 290 (JX-1 at 10:46-51), setting the value of Xabsolute in step 295 (JX-1 at 10:47-49), and comparing the difference of the peaks and the valley in step 305 (JX-1 at 10:52-65). Indication of the presence of two fingers does not occur until step 980. "If the result at step 305 is a Yes, then a determination is made that two fingers are in contact with the sensor and the variable Xfinger is set to two at step 980." (JX-1 at 15:26-29.) Thus the embodiments of Figure 6 and Figure 9 show indication of the presence of two fingers occurring after intermediate steps. Further, while these embodiments provide said indication in response to the detection of the first and second maxima, the indication will not occur if the height of these maxima does not exceed the threshold tests of steps 290 and 305. (JX-1 at Figure 6, Figure 9; Tr. at 582-83.)

Respondent Apple's expert, Balakrishnan, testified that because the indication depends in part on threshold tests, Claims 1 and 18 do not cover the embodiments of Figures 6 and 9. (Tr. at 582-83.) However, this argument is incompatible with the claim language. Claims 8 and 22, depending on claims 1 and 18, respectively, add the additional step of "comparing a distance between said first maxima and said second maxima to a predefined threshold." Claims 17 and 31, likewise depending on claims 1 and 18, respectively, add the additional step of requiring the first and second maxima to be higher than a first threshold, and requiring the said minima to be

less than a second threshold. Thus, because these claims cover the threshold comparisons outlined in Figures 6 and 9, such comparisons must be covered by claims 1 and 18 on which claims 8, 17, 22, and 31 depend.

Based on the foregoing, the administrative law judge finds that one of ordinary skill in the art would understand that the claim term "in response to" means "after and in reaction to," meaning that the indication of the presence of two fingers must occur at some time after the identification of the claimed first and second maxima, and that said indication must occur in reaction to at least the identification of the claimed first and second maxima.

During prosecution, the patentee submitted an amendment submitted on April 6, 1998. In that amendment the patentee distinguished the patent from U.S. Patent No. 5,495,077 by Miller et al. (Miller):

> The present invention uniquely utilizes the detection of two maxima to determine if two fingers are present on the touchpad. Nowhere does Miller suggest analyzing profile information to obtain this result, or to use the result to provide an indication of two fingers.

(JX-2 at 536.) Respondent Apple relies on this and similar passages from the prosecution history to argue that the invention was distinguished from the prior art in using only the detection of the two maxima to determine if two fingers are present. (R Supporting at 43.) While the patentee does distinguish the invention because it uses the detection of two maxima, the patentee does not do so to the exclusion of any other considerations. Miller did not use the detection of two maxima to provide an indication of the presence of multiple fingers. Instead, Miller used "the rapid movement of the centroid as a second finger is placed down on the touchpad and subsequently lifted." (JX-2 at 536.)

Respondent Apple also relies on the specification to show that only recognition of the claimed maxima indicates the presence of two fingers on the touchpad. The cited portion states:

> In particular, the circuitry, software or firmware of the touchpad circuitry, such as that shown in FIG. 2, detects a first maxima 85 indicative of a first finger in operative proximity to the touchpad 30, followed by a minima 90 indicative of a space between the fingers, and further followed by another maxima 95 indicative of a second finger operatively coupled to the touchpad 30.

(JX-1 at 6:29-35.) This passage teaches that the device detects a first maxima, followed by a minima, and further followed by another maxima. The passage does not, however, teach how the invention provides an indication of the presence of two fingers nor specify what is factored into providing such an indication.

4. "identify" (Claims 1 and 18)

Complainant's Construction	Respondent's Construction	Staff's Construction
"Establish the identity of; ascertain the origin, nature or definitive structure of"	"recognize a value to be"	"to ascertain the origin, nature or definitive characteristics of"

(C Post at 13; R Post at 21; S Supporting at 11.)

Complainant Elan argued that the claim term "identify" does not need construction, but that inasmuch as there is a need then a dictionary definition should be used. (C Post at 13.) Complainant Elan also argued that identification requires establishing the position at which the maximum or minimum occurs, but does not require any further analysis of the value. (C Post at 13.) Complainant Elan further argued that respondent Apple's construction could require that the value be written into memory. (C Supporting at 16.)

Respondent Apple, in support of its construction, argues that the claim term requires

recognition that a value is a maximum or a minimum, rather than only seeing the maximum or minimum value. (R Supporting at 39 (emphasis in original).) Respondent Apple further argued that prior art devices were able to see maxima and minima, and the present invention was distinguished as analyzing that information to detect the two maxima. (R Supporting at 40.) Respondent Apple also stated that it is not taking the position that the claims require writing data to memory. (R Opposing at 22.)

The staff, in support of its construction, argued that its definition is consistent with the plain meaning and with Apple's proposed construction. (S Supporting at 11.) The staff also argued that the claim term requires that the maxima, the minima, and the second maxima be definitively recognized as existing as defined values as compared to just being a collection of raw data from which one might extract a value. (S Supporting at 11.)

Claims 1 and 18 cite a method and means, respectively, of:

> scanning the touch sensor to (a) identify a first maxima in a signal corresponding to a first finger, (b) identify a minima following the first maxima, (c) identify a second maxima in a signal corresponding to a second finger following said minima, and providing an indication of the simultaneous presence of two fingers in response to identification of said first and second maxima.

(JX-1 at 16:15-23 (emphasis added).) The disputed claim term "identify" is used separately for each identification: the first maxima, the minima following the first maxima, and the second maxima following said minima. The identification of each maximum and minimum also occurs within the signal. The administrative law judge finds that one of ordinary skill in the art would understand from the claim language that the claim term "identify" requires reading the touch sensor signal and analyzing the data within that signal to recognize the data points corresponding

to the claimed maxima and minima.

The specification also confirms that "identify" requires analysis of the signal from the touch sensor. The specification describes the process through which the invention cycles through the finger profile to identify the claimed maxima and minima. The process begins searching for the first maxima:

> At some value of N the value of X(N) is less than the value of X(N-1), at which point the check at step 230 yields a NO. At this point, the peak has been found and at step 232 the value of Xpeak1 is set to X(N -1) and the value of Xstate is set to Valley.

(JX-1 at 9:51-55.) Thus identification of the first maxima occurs through a logic comparison between the maxima and the neighboring points on the profile and designating the position as the point at which the maximum occurs. Similar comparisons and designations occur to identify the minima following the first maxima (JX-1 at 10:1-5) and the second maxima following said minima (JX-1 at 10:9-25). The administrative law judge finds that one of ordinary skill in the art would understand from the specification that the claim term "identify" requires analysis of the touch sensor signal and designation of the location of the claimed maxima and minima.

During prosecution the patentee distinguished the '352 invention from the prior art based on the analysis of profile information to detect two maxima. In an office action dated December 5, 1997 the examiner rejected claims 1, 3-13, and 26-34 as obvious in view of U.S. Patent No. 5,648,642 by Miller et al. (Miller). (JX-2 at 477) The examiner stated that the Miller apparatus can detect and report if one or more points are being touched and can save and display the sensor information for every node in the apparatus. (JX-2 at 478.) In response, the patentee stated:

> Miller nowhere suggests detecting two fingers, and rather the Examiner is citing Miller as showing that it would generate the

> profile of two fingers if they were applied to Miller, since a value is obtained for each line. Claims 1 and 35 have been amended to further clarify the distinction of the invention from Miller. The present invention uniquely utilizes the detection of two maxima to determine if two fingers are present on the touchpad. Nowhere does Miller suggest analyzing profile information to obtain this result, or to use the result to provide an indication of two fingers.

(JX-2 at 535-36 (emphasis added).) Thus the administrative law judge finds that one of ordinary skill in the art would understand that identification requires analysis of the profile information to detect the claimed maxima and minima.

Based on the foregoing, the administrative law judge finds that one of ordinary skill in the art would understand the claim term "identify" to mean "recognize a value to be," which requires both analysis of the touch sensor signal and designation of the location of the claimed maxima and minima.

5. "means for scanning the touch sensor to (a) identify a first maxima in a signal corresponding to a first finger, (b) identify a minima following the first maxima, and (c) identify a second maxima in a signal corresponding to a second finger following said minima" (Claim 18)

Respondent's Construction	Staff's Construction
This limitation is governed by 35 U.S.C. § 112(6). The recited function is scanning the touch sensor. The corresponding structure is an analog multiplexer, a circuit to measure changes in capacitance of sensor conductors, an analog to digital converter, a microcontroller, and equivalents thereof. (agreed by the parties)	This limitation is governed by 35 U.S.C. § 112(6). The recited function is scanning the touch sensor to (a) identify a first maxima in a signal corresponding to a first finger, (b) identify a minima following the first maxima, and (c) identify a second maxima in a signal corresponding to a second finger following said minima. The corresponding structure is an analog multiplexer, a circuit to measure changes in capacitance of sensor conductors, an analog to digital converter, a microcontroller, and Fig. 5 (items, 400-440) and Fig. 6-1 (items 200-278)

(R Supporting at 3; S Supporting at 14.)

Complainant Elan does not appear to address this claim term in its briefs.

Respondent Apple proposed a construction and stated in its motion for summary determination that respondent and complainant are in agreement regarding said construction. (R Motion at 3.) However, in response to the staff's proposed construction, respondent Apple stated that the staff's proposed clarification of the recited function is "well taken" and that it "does not disagree" with the additional structural elements proposed by the staff.

The staff, in support of its construction, argued that the function proposed by the private parties is incomplete because the claimed function includes both scanning and identification of the claimed maxima and minima. (S Supporting at 13-14.) The staff further argued that because the function includes identification steps, the structure must also include an algorithm that accomplishes the claimed identification function. (S Supporting at 14.)

Claim 18 of the '352 patent reads:

> 18. A touch sensor for detecting the operative coupling of multiple fingers comprising:
> means for scanning the touch sensor to (a) identify a first maxima in a signal corresponding to a first finger, (b) identify a minima following the first maxima, and (c) identify a second maxima in a signal corresponding to a second finger following said minima, and
> means for providing an indication of the simultaneous presence of two fingers in response to identification of said first and second maxima.

(JX-1 at 17:28-37.) Claim 18 recites two separate means: a means for scanning the touch sensor to identify the claimed maxima and minima, and a means for providing an indication of the simultaneous presence of two fingers in response to said identification. The administrative law judge therefore finds that one of ordinary skill in the art would understand from the claim

language that the claimed function includes both scanning the touch sensor and identifying the claimed maxima and minima within the signal.

The specification gives the corresponding structure for these scanning and identifying functions. Figure 2 of the '352 patent shows a diagram of the electronics in a touchpad. (JX-1 at Fig. 2, 5:21-22.) The '352 patent describes this figure as follows:

> A touchpad matrix 30 is composed of a plurality of rows 35 and columns 40 of wires or traces arranged in a conventional manner . . . The rows and columns are connected to an analog multiplexor 45 through a plurality of X (row) direction conductors 50 and a plurality of Y (column) direction conductors 55, one conductor for each row and each column. Under the control of a microcontroller 60, the analog multiplexor 45 selects which traces of the matrix 30 will be sampled, and the output of those traces is then provided to a capacitance measuring circuit 70 . . .
>
> The output of the capacitance measuring circuit is then provided to an analog to digital converter 80, which operates as described in either of the above-referenced patent applications to convert the capacitance values from the circuit 70 into a digital representation. The analog to digital converter 80 then supplies the signals to the microcontroller 60, which operates to form, among other things, a finger profile for one or more fingers, X-Y cursor data, and control signals. Depending on the operation being performed at the particular time, the output of microcontroller 60 is then supplied to an interface to a PC or other device, such as a PS/2 interface, an RS-232 interface, or an Apple Desktop Bus (ADB).

(JX-1 at 5:23-55 (references omitted).) The patent thus teaches that the analog multiplexor 45, the microcontroller 60, the capacitance measuring circuit 70, and the analog to digital converter 80 are all involved in scanning the touch sensor. (Tr. at 261:10-262:2.)

The identification of the claimed maxima and minima is not detailed in Figure 2. The specification states:

> In an exemplary embodiment, the operation of the system of FIG. 2

> is controlled in either firmware, software or hardware. Shown in FIG. 5 is a flow diagram showing the general operation of such software or firmware which is capable of detecting multiple fingers, and which uses the algorithm of FIG. 6, discussed hereinafter.

(JX-1 at 7:1-6.) Thus the operation of the system can physically occur in firmware, software or hardware. But they each must operate using the flow diagrams in Figure 5 and Figure 6, as specified. The specification outlines the steps included in the scanning and identification processes:

> Referring still to FIG. 5, the cyclical process begins at step 400, and continues at step 410 by scanning the conductor sensors . . . The cycle process continues by performing the Xcompute loop of FIG. 6 discussed hereinafter, and also the Ycompute loop analogous to FIG. 6, at step 430 and 440, respectively. In general, the function of the Xcompute and Ycompute processes is simply to evaluate the current measurements by calculating the centroid of the finger measurement, and by detecting whether a second finger is touching the pad-which determines the button state.

(JX-1 at 7:34-48.) Thus the specification provides that steps 400 and 410 of Figure 5 are involved in scanning the conductor sensors. The Xcompute and Ycompute processes, executed at steps 430 and 440, respectively, are involved in detecting whether a second finger is touching the pad. As found, supra, the claim term "identify" requires analysis of the touch sensor signal and designation of the location of the claimed maxima and minima. This occurs in Figure 6-1, and likewise in Figure 9-1. (Tr. at 528:6-529:9.) Complainant Elan's expert, Dezmelyk, testified that only step 220, which performs a sum to calculate the centroid, can be omitted in the process of identifying the maxima and minima. (Tr. at 277:11-278:2.) Figures 6-1 and 9-1 are identical, as Figures 6 and 9 are identical up through step 290. (JX-1 at 15:15-16, Fig. 6 and 9; Tr. at 529:17-24.)

Based on the foregoing, the administrative law judge finds that one of ordinary skill in the art would understand that the claim term "means for scanning the touch sensor to (a) identify a first maxima in a signal corresponding to a first finger, (b) identify a minima following the first maxima, and (c) identify a second maxima in a signal corresponding to a second finger following said minima" is written in means-plus-function format, and that the recited function is scanning the touch sensor to (a) identify a first maxima in a signal corresponding to a first finger, (b) identify a minima following the first maxima, and (c) identify a second maxima in a signal corresponding to a second finger following said minima. The administrative law judge further finds that the corresponding structure is an analog multiplexer, a circuit to measure changes in capacitance of sensor conductors, an analog to digital converter, a microcontroller, and Fig. 5 (items, 400-440) and Fig. 6-1 or Fig. 9-1 (items 200-278).

6. "means for providing an indication of the simultaneous presence of two fingers in response to identification of said first and second maxima" (Claim 18)

Complainant's Construction	Respondent's Construction	Staff's Construction
This limitation is governed by 35 U.S.C. § 112(6). The recited function is providing an indication of the simultaneous presence of two fingers in response to identification of said first and second maxima. The corresponding structure is firmware or software that provides data indicating the presence of two fingers in response to the identification of two maxima and equivalents thereof.	This limitation is governed by 35 U.S.C. § 112(6). The recited function is providing an indication of the simultaneous presence of two fingers in response to identification of said first and second maxima. The corresponding structure is the algorithm found in Fig. 8-1, which sets a finger value equal to two after determining if a scan in either the X direction or the Y direction has detected two fingers.	This limitation is governed by 35 U.S.C. § 112(6). The recited function is providing an indication of the simultaneous presence of two fingers in response to identification of said first and second maxima. The correct corresponding structure is a microcontroller programmed as shown in Fig. 5 (items 450-540) or as shown in Fig. 8-1 (item 850) to Fig. 8-2 (915).

(C Post at 19; R Post at 30; S Supporting at 15.)

Complainant Elan, in support of its construction, argued that the claimed functions can be implemented locally on the microcontroller 60 via firmware, or in hardware or software running on the host. (C Post at 20.) Complainant Elan also argued that "Figures 5, 6, 8 and 9 show several different ways in which an indication of the presence of two fingers can be performed by firmware, software or hardware." (Id.) Complainant Elan further argued that the constructions proposed by Apple and the Staff are improperly narrow. (Id.)

Respondent Apple, in support of its construction, argued that only steps 850 and 860 of Fig. 8-1, where the Finger variable is set to two, can provide an indication of the presence of two fingers. (R Post at 30.) Respondent Apple further argued that the bulk of Figures 8-1 and 8-2

pertain to preliminary steps such as collecting data and identifying maxima, and that Figures 5, 6, and 9 are incompatible with Apple's proposed construction for "in response to." (R Post at 30-31.)

The staff, in support of its construction, argued that it is consistent with the patent's disclosure of how to accomplish the claimed invention. (S Supporting at 15.) The staff further argued that complainant Elan's proposed construction does not include an algorithm as required for computer-based structures. (S Supporting at 16.) The staff also argued that respondent Apple's proposed construction is under-inclusive. (S Post at 6.)

The parties have agreed that the recited function is providing an indication of the simultaneous presence of two fingers in response to identification of said first and second maxima. (C Post at 19; R Post at 30; S Supporting at 15.) Therefore the dispute is limited to the corresponding structure.

At the outset, the administrative law judge finds that complainant Elan's proposed construction is improper as a matter of law because it does not contain an algorithm. With respect to means-plus-function claim terms related to computer-implemented inventions, the Federal Circuit requires that the disclosed structure "be more than simply a general purpose computer or microprocessor." Aristocrat Techs. Austl. Pty Ltd. v. Int'l Game Tech., 521 F.3d 1328, 1333 (Fed. Cir. 2008). The required disclosure must include a specific algorithm as a necessary part of the disclosed structure to avoid purely functional claims that allow for any device that performs said function. See, e.g., WMS Gaming, Inc. v. Int'l Game Tech., 184 F.3d 1339, 1349 (Fed. Cir. 1999); Aristocrat Techs., 521 F.3d at 1337; Finisar Corp. v. DirecTV Group, Inc., 523 F.3d 1323, 1340-1341 (Fed. Cir. 2008) ("Simply reciting 'software'

without providing some detail about the means to accomplish the function is not enough"); Blackboard, Inc. v. Desire2Learn, Inc., 574 F.3d 1371, 1384 (Fed. Cir. 2009) ("when a computer is referenced as support for a function in a means-plus-function claim, there must be some explanation of how the computer performs the claimed function.")

Claim 18 of the '352 patent reads:

> 18. A touch sensor for detecting the operative coupling of multiple fingers comprising:
>
> means for scanning the touch sensor to (a) identify a first maxima in a signal corresponding to a first finger, (b) identify a minima following the first maxima, and (c) identify a second maxima in a signal corresponding to a second finger following said minima, and
>
> means for providing an indication of the simultaneous presence of two fingers in response to identification of said first and second maxima.

(JX-1 at 17:28-37.) Claim 18 recites two separate means: a means for scanning the touch sensor and identifying the claimed maxima and minima, and a means for providing an indication of the simultaneous presence of two fingers in response to said identification. Thus the administrative law judge finds that one of ordinary skill in the art would understand from the claims that the means for providing an indication does not include the steps required for identification of the claimed maxima and minima.

With respect to the disputed claim term "in response to" the administrative law judge found, supra, that the process of providing an indication of the simultaneous presence of two fingers does not begin until some time after the identification of said first and second maxima. Further, the administrative law judge has also found, supra, that the corresponding structure for scanning the touch sensor to identify the claimed maxima and minima includes items 400-440 of

Fig. 5 or Fig. 8, and all of Fig. 6-1 or Fig. 9-1 (items 200-278). Thus the administrative law judge will look to steps that occur after Fig. 6-1 or Fig. 9-1 to determine the corresponding structure of the means for providing an indication of the simultaneous presence of two fingers.

Immediately after Fig. 9-1 is executed, the algorithm will continue in Fig. 9-2. Step 295 is used to generate coordinates for the centroid, and therefore is unnecessary to perform the claimed function. (JX-1 at 10:46-49; Tr. at 278:8-11.) Steps 305 performs a threshold comparison to avoid artifacts by determining if a legitimate valley and two legitimate peaks have been detected. (JX-1 at 10:52-65.) However this threshold comparison step is embodied in dependent claim 31, therefore steps 305-315 are not necessary to accomplish the invention of claim 18. (JX-1 at 18:46-49.) Step 980 deter

Continuing to Figure 8, the specification explains:immediately after performing the Xcompute and Ycompute loops, at step 850 the algorithm checks whether either of those loops has detected two fingers. (JX-1 at Figure 8.) If the answer is yes, then step 860 sets a variable "Finger" to the value of 2, thus providing an indication of the simultaneous presence of two fingers. (JX-1 at Figure 1; Tr. at 191:11-18.) Thus steps

> In FIG. 8, the process begins in a manner identical to FIG. 5, starting at step 400 and followed by scanning the conductors and storing the results of the scan in memory at step 405, followed by Xcompute and Ycompute at steps 430 and 440, respectively. For this embodiment, Xcompute is shown in FIG. 9, and Ycompute is identical to Xcompute. At step 850, a determination is made whether two fingers are in contact with the touchpad by evaluating both Xcompute and Ycompute. If neither Xcompute nor Ycompute indicate the presence of two fingers, the answer is NO and the process drops to step 855. However, if either the Xcompute routine or the Ycompute routine indicates the presence of two fingers, the answer at step 850 is YES and the process moves to step 860, where the value of the variable FINGER is set to 2.

(JX-1 at 14:1-17 (emphasis added).) The specification shows that step 850 of Figure 8 considers the results of both Xcompute and Ycompute to determine whether two fingers are in contact with the touchpad. If they are in contact then an indication is provided at step 860 of Figure 8.

Based on the foregoing, the administrative law judge finds that one of ordinary skill in the art would understand that the claim term "means for providing an indication of the simultaneous presence of two fingers in response to identification of said first and second maxima" is a means-plus-function claim, that the corresponding function is providing an indication of the simultaneous presence of two fingers, and the corresponding structure is step 860 of Figure 8 where the value of the "Finger" variable is set to equal two.

Complainant argued that a structure of only step 860 of Figure 8 would be too narrow because step 860 relies on step 980 of Figure 9-2, which is also an indication of the presence of two fingers. (C Opposing at 37.) However, if step 980 within the Xcompute loop of Figure 9 were sufficient alone to determine the simultaneous presence of two fingers, then the algorithm would skip the Ycompute loop as well as steps 850-870 where a determination of the number of fingers is made. (JX-1 at 14:8-27.) Further, when asked how the claimed invention selects an appropriate control function based, among other things, on the number of fingers detected, Complainant Elan's expert, Dezmelyk, testified:

> There are a number of tests here that we will look at the first one. It says, do we have -- what is the number of fingers?
>
> And I will highlight the tests. The 5 tests are at 850, 855, and the setting of the variable called "finger," it happens at one of the four blocks, 870, 860, or 865.
>
> And there is a set of tests here based on how many fingers we saw in each of the profiles that tell us whether we have zero fingers,

one finger or two fingers present.

(Tr. at 288:1-11 (emphasis added).) Therefore because the indication of the simultaneous presence of two fingers requires analyzing both profiles, step 980 of Figure 9-2 does not accomplish the claimed function. For the same reason, step 310 of Figure 6-2, which sets Xbutton equal to "Down" if the Xcompute loop finds two peaks, does not accomplish the claimed function.

The staff argued that items 450-540 of Figure 5 are part of the corresponding structure. (S Supporting at 15.) However these steps do not provide an indication of the simultaneous presence of two fingers, rather they provide an indication of a change in the number of fingers:

> In the exemplary embodiment, only a change in the button state is reported. As a result, at step 450 the value of Button is set to No Change. . .
>
> The process continues by comparing the current and previous button States of the X and Y conductors. First, at step 460, the state of Xbutton is checked to see if it is Down and the State of XbuttonPrevious is checked to see if it is Up. If both compares are true, then the variable Button is set to Down at Step 465. In addition, at Step 470, the State of Ybutton is checked to see if it is Down and the State of YbuttonPrevious is checked to see if it is Up. If both compares are true, the variable Button is also set to Down.
>
> Alternatively, as determined at step 480, if the state of Xbutton is Up and the state of XbuttonPrevious is Down, or, as checked at step 490, the state of Ybutton is up and YbuttonPrevious is Down, then the variable Button is set to Up at step 495.

(JX-1 at 7:49-8:3.) Thus, as said portion of the specification indicates, while the button state is indicative of the presence of two fingers, the specification teaches that Figure 5 reports only a change in the button state. Moreover, if the button state has not changed, the variable Button will

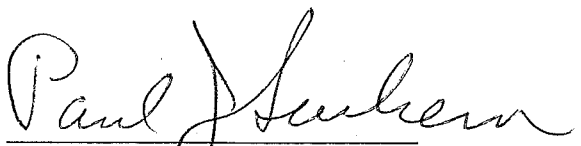
remain at "No Change" and the reporting step at 540 will not be executed.

Complainant Elan's expert, Dezmelyk, is in agreement with JX-1 at 7:49-8:3. Hence he testified:

> So, in this case, in 460, the question is, is Xbutton down and the previous Xbutton was up? And that means there has been a change in the number of fingers that were present on the touchpad. Because we set Xbutton based on whether we had two or one finger in contact.
>
> So here, in the case, where Xbutton was -- we had Xbutton down, meaning we had two fingers, and last time before that, it was up, we're going to say, set button equal to down.
>
> . . . We will set the change in position to zero and we will report the button.
>
> And report means we will send information out of the device to the computer we're connected to that says a button got pressed. That's the meaning of this step of reporting a button.

(Tr. at 247:18-248:4, 248:11-17.) Thus the administrative law judge finds that step 460 indicates only a change in the number of fingers present on the touchpad, which is later used to report that a button got pressed.

This order will be made public unless a bracketed confidential version is received no later than the close of business on November 26, 2010.



Paul J. Luckern
Chief Administrative Law Judge

Issued: November 9, 2010

APPENDIX A

ABBREVIATIONS

C Supporting	Complainant's Brief in Support of Motion for Summary Determination
C Opposing	Complainant's Response to Respondent's and Staff's Motions For Summary Determination
C Post	Complainant's Post-Hearing Brief
C Post Reply	Complainant's Response to Respondent's and Staff's Post-Hearing Briefs
JX	Joint Exhibit
R Supporting	Respondent's Brief in Support of Motion for Summary Determination
R Opposing	Respondent's Response to Complainant's and Staff's Motions For Summary Determination
R Post	Respondent's Post-Hearing Brief
R Post Reply	Respondent's Response to Complainant's and Staff's Post-Hearing Briefs
S Supporting	Staff's Brief in Support of Motion for Summary Determination
S Post	Staff's Post-Hearing Brief
S Post Reply	Staff's Response to Complainant's and Respondent's Post-Hearing Briefs
Tr.	Transcript of Markman Hearing

CERTAIN ELECTRONIC DEVICES WITH MULTI-TOUCH ENABLED TOUCHPADS AND TOUCHSCREENS **337-TA-714**

CONFIDENTIAL CERTIFICATE OF SERVICE

I, Marilyn R. Abbott, hereby certify that the attached **Order** has been served by hand upon the Commission Investigative Attorney, Kevin G. Baer, Esq., and the following parties as indicated, on November 9, 2010.

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