> A. Yes. So there is the touch sensitive display. There you see the whole web page being viewed. We can do various things that cause only a portion of the page to be viewed at any point in time.

(*Id.*at 113-114 (citing Tr. (Abowd) at 1522-23).) According to Staff, the evidence shows that the iOS 5 operating system controls the display of all information on an Accused Product's touch-sensitive display and includes a graphics and drawing system for displaying content. (*Id.* (citing Tr. (Abowd) at 1522-23).) The Safari, Photos, Music, Newstand, Mail, iTunes, and App Store application all use this infrastructure. (*Id.*)

Fourth, argues Staff, the Accused Products contain "a display monitor in communication with the touch-sensitive display screen for detecting motion of a pointer across the touch-sensitive display[.]" (*Id.* at 114 (citing JXM-9 at 16:13-15).) Staff cites the following testimony given by Dr. Abowd:

> Q. Does the iPhone 4S have a display monitor in communication with the touch sensitive display?
>
> A. It does. So the fact that I can touch this display and perform particular actions and the underlying application does things, means that there has to be a path that goes from the physical action of touching the display to something that causes the application to perform behavior, like I am showing on the screen now. So that is the display monitor that is capturing those particular events and sending them on to other parts of the software.
>
> Q. Is this display monitor detecting motion of a pointer across the touch sensitive display?
>
> A. Yes. So in this case, the pointer is my finger. And because you can see a reaction to my finger as I am touching the display here, it is actually detecting the movement of the finger and the various touch events that are being caused there. And that's what the display monitor is capturing.

(*Id.* (citing Tr. (Abowd) at 1523-24).)

Staff notes that Order No. 63, at 143, construed the term "display monitor" as "a process that monitors the display." (*Id.*) Staff says that in the iOS operating system, touch and other

motion events are processed by the event-handling system, which communicates with the touch-sensitive display screen to track such events. (*Id.* at 114-115.) Events are delivered to the relevant application { } and any time a finger touches the screen, is dragged on the screen, or lifts from the screen, { }. (*Id.* at 115 (citing Tr. (Abowd) at 1542; CX-1551).)

Fifth, Staff says that the Accused Products contain a "velocity detector" that determines a velocity based on a velocity of detected motion. (*Id.* (citing JXM-9 at 16:16-17; Tr. (Abowd) at 1524-25).) Specifically, the iOS 5 operating system supports and handles various gestures, including a pan gesture, { }. (*Id.*) Through the iOS 5 event-handling system, {

}. (*Id.* (citing CX-1552).) For example, argues Staff, a "panning" gesture is continuous and begins { }:

> Q. Let me focus your attention on UIPGestureRecognizer. How does UIPanGestureRecognizer recognize a pan gesture?
>
> A. {
>
> }

(*Id.* (citing Tr. (Shaffer) at 1831).) {

}. (*Id.*)

Lastly, Staff says the evidence shows that the process described above constitutes "an interface process in communication with the display monitor for processing the motion detected by the display monitor to detect one of a plurality of commands, wherein the plurality of commands includes a pan command, wherein, in response to the command detected by the interface process being the pan command, the engine pans the displayed document on the display at a rate based on the determined velocity vector." (*Id.* (citing JXM-9 at 16:18-22).) Staff says that Order No. 63 construed "rate based on the determined velocity vector" to mean "rate calculated from the determined velocity vector. (*Id.* (citing Order No. 63 at 129).) According to Staff, in the Accused Products the pan rate is based on the {

}. (*Id* (citing Tr. (Abowd) at 1534; CX-17C).) In other words, once a sensed motion is identified as a pan command, the UIScrollView object pans the displayed document across the display screen at a rate calculated from the determined velocity vector. (*Id.*)

b) Claim 2

Staff says the evidence indicates that all of the Accused Products infringe dependent claim 2, which discloses that "panning the displayed document comprises rendering different

views of the document on the touch-sensitive display at a rate based on the determined velocity vector and a page inertia." (*Id.* (citing JXM-9 at 16:27-30).) According to Staff, the specification explains that "the velocity may decrease by a constant page inertia until it reaches zero velocity and page scrolling ceases[.]" (*Id.* (citing JXM-9 at 14:26-28).) In the Accused Products, {

}. This rate, says Staff, includes a page inertia, which decelerates { } once the user's finger has lifted off the screen. (*Id.* (citing Tr. (Abowd) at 1596-97).)

c) Claim 3

Staff says the Accused Products infringe claim 3, which Staff says is identical to claim 1 except for the last element, which states that "the engine renders a series of pages of the document on the touch-sensitive display at a rate based on the determined velocity vector and a page inertia." (*Id.* (citing JXM-9 at 16:31-56).) In Staff's view, the Accused Products have all of the identical elements for the reasons discussed in Staff's prior analysis of claim 1. (*Id.* at 117-118.) As regards the last element of claim 3, Staff says the evidence shows that {

}. (*Id.* (citing Tr. (Abowd) at 1596-97).) Staff says Apple source code confirms that { }. (*Id.* (citing Tr. (Abowd) at 1597-99; CX-17C).)

d) Claim 4

Staff says that in the Accused Products {

}. (*Id.* (citing Tr. (Abowd) at 1597-99; CX-17C).) Therefore, Staff concludes that the Accused Products infringe this claim. (*Id.*)

e) Claim 5

Staff argues that the Accused Products infringe claim 5 for the reasons Staff discussed regarding infringement of claims 1 and 3. (*Id.* at 119.) Staff says that when a pan gesture is detected, {

}. (*Id.*)

Staff says that, as discussed in relation to the prior claims of the '114 patent, the calculated pan rate includes a page inertia, {

}. (*Id.* (citing Tr. (Abowd) at 1596-97).) Upon detection of a subsequent pan command, however, the subsequent gesture is recognized and {

}. (*Id.* (citing Tr. (Abowd) at 1608-09).) As a result, argues Staff, the {

}. (*Id.* at 120.)

4. Samsung's Response to Apple's Non-infringement Contentions

a) Infringement under the doctrine of equivalents

Samsung says that, contrary to Apple's assertions, Samsung and Dr. Abowd do not agree that the specification at column 14, lines 6-9 provide the only description of "velocity detector" in the '114 patent. (CRBr. at 137 (referring to RBr. at 212).) That portion of the patent states: "In the depicted embodiment, during a document drag operation a velocity detector process takes position readings periodically, such as every centi-second." (*Id.* (citing Tr. (Balakrishnan) at 2727; JXM-9 at 14:6-9).) Samsung says the passage makes clear that the "velocity detector process," as opposed to just the "velocity detector," takes the position readings. (*Id.* (citing Tr. (Abowd) at 1499-1501, 1510-11).) Samsung says Dr. Abowd explained both at his deposition and at the hearing that the "velocity detector process" comprises several limitations of claim 1,

including the display monitor which detects motion of a pointer across the screen (*id.* (citing JXM-9 at 16:13-15), an interface process in communication with the display monitor for processing the motion detected, and the velocity detector which determines a velocity vector based on that detection. (*Id.* at 137-138 (citing JXM-9 at 16:16-18; Tr. (Abowd) at 1499-1501, 1510-11).)

Samsung argues that, assuming that Apple is correct, the passage only describes one embodiment of the invention, which the claims do not implement. (*Id.* at 138.) Samsung says the claims make clear that the display monitor, not the velocity detector, takes position reading on the screen as it "detect[s] motion of a pointer across the touch-sensitive display." (*Id.* (citing JXM-9 at 16:14-15).) The velocity detector, on the other hand, "determine[s] a velocity vector based on a velocity of detected motion." (*Id.* (citing JXM-9 at 16:16-17).) Thus, argues Samsung, a person of ordinary skill in the art would understand velocity detector to mean something that determines a velocity vector, not something that "takes position readings." (*Id.* (citing Tr. (Abowd) at 1499-1501, 1510-11).) Therefore, according to Samsung, Apple's erroneous and untimely construction of "velocity detector" should be rejected. (*Id.*)

Samsung says the UIPanGestureRecognizer is the "velocity detector" in the Accused Products. (*Id.* (citing CBr. at 200-207).) {

}. (*Id.* (citing Tr. (Abowd) at 1571-79, 1582-89, (Shaffer) at 1848-49; CX-16C; CX-17C).) Samsung says both it and Staff agree that this calculation is the determined velocity vector in the Accused Products. (*Id.* at 138-139 (citing SBr. at 115-116).)

{

} (*Id.* 139 (citing RBr. at 215-217; Tr. (Balakrishnan) at 2667-68). These arguments, says Samsung, ignore the plain language of claim 1, which states: "a velocity detector for determining a velocity vector based on a velocity of the detected motion." (*Id.* (citing JXM-9 at 16:16-17).) The velocity vector need not represent the exact velocity of the detected motion, it merely must be "based on" it. (*Id.*) Samsung argues that this is precisely what occurs in the Accused Products, which is highlighted by several facts. (*Id.*)

{

} This can be seen, says Samsung, merely by operating the iPhone 4S, as Dr. Abowd demonstrated at the hearing: when the finger moves fast, the Web page is panned faster in the direction of the user's finger. (*Id.* (citing Tr. (Abowd) at 1508, 1524-27).) If the finger moves slowly, the Web page is panned slower in the direction of the movement of the user's finger. (*Id.*)

Samsung says Apple cites unexplained "testing data" for the proposition that {

} (*Id.* (citing RBr. at 217).) Samsung argues that the reliability of this data is dubious because Dr. Balakrishnan failed to provide any explanation of the testing parameters, circumstances, or environment in which the tests occurred. (*Id.* (citing Tr. (Balakrishnan) at 2649-58).) For instance, he did not discuss the load on the application processor when the tests were performed, and the data does not indicate how the pan gestures were performed or how many other gestures were performed at one time. (*Id.*) Thus, argues Samsung, there is no indication that the tests occurred under normal usage conditions of iOS 5 or are otherwise reliable. (*Id.* (citing *Certain Sucralose, Sweeteners Containing Sucralose, and Related Intermediate Compounds Thereof,* Inv. No. 337-TA-604, Comm'n Op. at 90 (Apr. 28, 2009) (finding tests unreliable where there was no testimony regarding the methodology used or the reliability of the results)).)

As for Apple's arguments against Samsung's allegations that the Accused Products infringe under the doctrine of equivalents, Samsung counters that, contrary to Apple's claim, Dr.

Abowd did not offer any new opinions in that regard at the hearing. (*Id.*) Further, argues Samsung, no claim scope was surrendered during the prosecution of the '114 patent that would bare an analysis under the doctrine of equivalents. (*Id.* at 140-141.) Samsung argues that if Apple had concerns regarding the extent of Samsung's disclosures or expert report, Apple had the obligation to compel additional information and not wait until the hearing to raise such concerns. (*Id.* (citing *Certain Equipment for Communication Networks, Including Switches, Routers, Gateways, Bridges, Wireless Access Points, Cable Modems, IP Phones, and Products Containing Same,* Inv. No. 337-TA-778, Order No. 36 at 1-2 (U.S.I.T.C., 2012)).) Samsung says Apple never challenged the sufficiency of Dr. Abowd's doctrine of equivalents analyses prior to the hearing, and its attempts to do so now are untimely and improper. (*Id.*)

Samsung says Apple's complaints about the sufficiency of Dr. Abowd's analysis is not demonstrated by the facts because Dr. Abowd's expert report specifically includes a section analyzing the "velocity detector" limitation under the function-way-result test for purposes of infringement under the doctrine of equivalents and Dr. Abowd testified at the hearing that the "velocity detector" has the same function as he identified in his initial expert report, according to the following excerpt:

Dr. Abowd's Initial Expert Report	Dr. Abowd's Hearing Testimony
"The function . . . is to ***determine a velocity vector based on a velocity of the user's detected motion*** on the touch-sensitive display." (Ex. 11, Abowd Rep. ¶ 146 (emphasis added).)	Q: Is this doing substantially the same function or not doing substantially the same function? A: It is doing substantially the same function in ***calculating that velocity vector based on the detected motion*** (Abowd Tr. 1601:18-23 (emphasis added).)

(*Id.*)

Samsung says that Dr. Abowd also identified the source code files and frameworks in the Accused Products, { } perform the function in substantially the same way, in his initial expert report. (*Id.* at 142.) Samsung says that Dr. Abowd stated that {

}. (*Id.* (citing Tr. (Abowd) at 1602.)

Samsung cites the following excerpt from Dr. Abowd's report in this regard: {

}

(*Id.*)

Samsung says Dr. Abowd also testified as to the same result that occurs in the Accused Products as specified in his initial report: that the Accused Products calculate or determine a velocity vector, which both parties agree represents the change in distance over the change in time and use that velocity to pan the displayed document. (*Id.* (citing Tr. (Balakrishnan) at 2636-37, (Abowd) at 1602).) Samsung cites the following excerpt from Dr. Abowd's initial report in this regard: {

}

(*Id.* at 142-143.) Thus, according to Samsung, Apple's contention that Dr. Abowd "offers a new "function," a new "way," and a new "result" is meritless. (*Id.* at 143.)

Samsung says Apple's attack on Dr. Abowd is especially improper given Apple's failure to identify that it was construing the term "velocity detector" to have a special meaning and in its responses to Samsung's contention interrogatories on infringement Apple took the position that the Accused Products do not infringe because they simply do not have a "velocity detector," and a month later, after Dr. Abowd had submitted his initial report, Apple changed its position to the one it currently offers: that the "velocity detector" in the Accused Products is the firmware because "velocity detector" must take position readings from the touch screen. (*Id.* (citing RBr. at 200-203).) To the extent that Dr. Abowd elaborated on his doctrine of equivalents analysis at the hearing, it was to address and respond to Apple's untimely construction of "velocity detector," argues Samsung. (*Id.* (citing Tr. (Abowd) at 1593-95, 1601-03).)

Samsung reasserts its contention that the Accused Products infringe under the doctrine of equivalents even under Apple's special construction because both parties' experts agree that the function of the velocity detector is to determine a velocity vector based on the velocity of the detected motion. (Id. (citing Tr. (Balakrishnan) at 2745, (Abowd) at 1601).) The way this is

done, argues Samsung, is not substantially different than Apple's construction, noting that Dr. Balakrishnan said the way to perform this function is to "determine a velocity based on position readings of the user's pointer taken directly from the touch-sensitive display at regular intervals. (*Id.* at 143-144 (citing Tr. (Balakrishnan) at 2759).) Samsung contends that there is no dispute that in the Accused Products the firmware takes {

}.

(*Id.* at 144 (citing Tr. (Balakrishnan) at 2646-48, 2732-35, (Shaffer) at 1846, (Parivar) at 1898-1904).) Samsung says Dr. Balakrishnan admitted that {

}. (*Id.* (citing Tr. (Balakrishnan) at 2645-48, 2734, (Shaffer) at 1846).) Samsung says Dr. Abowd explained that the way the function is performed by the Accused Products and the result are insubstantially different than the construction Dr. Balakrishnan proposed. (*Id.* (citing Tr. (Abowd) at 1600-03).)

b) Prosecution estoppel

Samsung reasserts that it presented undisputed evidence that the addition of the "velocity detector" limitation to claim 50, which issued as claim 3, during prosecution bore no more than a tangential relationship to the equivalent in question (*Id.* (citing CBr. at 205-207).) Samsung argues that even though the applicant amended claim 50 to distinguish the invention over the prior art, the applicant argued that the invention was new and non-obvious because it describes a computing device that causes an engine to render a series of pages at a rate that is determined

based on a detected velocity associated with a motion that triggers the command and based on page inertia. (*Id.*) Notably, says Samsung, the term "velocity detector" was not discussed in these remarks or in the examiner's reasoning for allowing the claim. (*Id.* at 144-145.) Samsung argues that the prosecution history shows that the focus of the applicant's arguments centered on the device's ability to render a series of pages of a document on a display at a rate based on the determined velocity vector, not the type of velocity detector or the manner in which the device detects the velocity of a user motion. (*Id.*) Samsung says the "velocity detector" limitation was never narrowed during prosecution and therefore prosecution estoppel does not apply. (*Id.* at 145 (citing *Regents of University of Cal. v. Dakocytomation Cal., Inc.*, 517 F.3d 1364, 1378 (Fed. Cir. 2008)).)

(1) *Rate Based on the Determined Velocity Vector Limitation*

Samsung argues that, contrary to Apple's assertions, Dr. Abowd specifically identified { } as the "determined velocity vector": { }

(*Id.* (citing Ex. 11, Abowd Rep. at ¶ 144).) Samsung says that Apple's reliance on a single statement by Dr. Abowd during his deposition, which was corrected later in that deposition and

also through an errata, is a mischaracterization of the facts and a distraction from the merits of the case. (*Id.*) Samsung argues that Apple points to Dr. Abowd's May 30, 2012 deposition errata as a "significant shift" in his opinion by relying on and "entirely different software module." (*Id.* (citing RBr. at 226-227).) Samsung says that, as can be seen from the excerpted portion of Dr. Abowd's initial report and deposition testimony, the errata is not a departure from his initial opinions and therefore Dr. Abowd's testimony at the hearing as to {

} is consistent with his initial expert report and deposition and should not be stricken. (*Id.* at 146.)

Samsung says that Apple's entire argument for the limitation "rate based on the determined velocity vector" hinges on Apple's mischaracterization of Dr. Abowd's position on the "determined velocity vector" {

}" (*Id.*) Samsung says the undisputed evidence demonstrates that the Accused Products pan the display "at a rate based on the determined velocity vector." (*Id.*) {

}

(*Id.* (citing Tr. (Abowd) at 1582-89, (Balakrishnan) at 2660-61).) Samsung says Apple refers to { }. (*Id.* (citing RBr. at 225-227).)

Samsung says Apple erroneously claims that {

}, but this ignores basic principles of geometry. (*Id.*) Samsung argues that in a two-dimensional Cartesian coordinate system, one way a velocity in a direction D with a change in

both horizontal and vertical directions can be represented is in a vector with both X and Y components. (*Id.*) {

}, argues Samsung. (*Id.* at 147 (citing Tr. (Abowd) at 1558-60, 1566-76, (Shaffer) at 1849).)

Samsung says that, in the Accused Products, {

}. (*Id.* (citing Tr. (Abowd) at 1582-89).) Samsung says that Apple's own fact witness, Joshua Shaffer, {

}. (*Id.* (citing Tr. (Shaffer) at 1838-39, 1849, 1852-54).) Samsung says that both it and Staff agree that {

}. (*Id.* (citing SBr. at 115-116).)

As for Apple's contention that Dr. Abowd did not offer any testimony or opinion regarding the doctrine of equivalents in respect to the "rate based on the determined velocity vector," Samsung says this is erroneous. (*Id.* (citing RBr. at 231).) Samsung says that Dr. Balakrishnan testified that he only challenged the "determined velocity vector" portion of the limitation "rate based on the determined velocity vector," but as previously argued, Dr. Abowd did offer a doctrine of equivalents analysis for the "velocity detector," which includes "determining a velocity vector." (*Id.* (citing Tr. (Balakrishnan) at 2671-77).)

5. Apple's Response to Samsung's Infringement Contentions

a) Operation of the Accused Products

In its reply, Apple again notes that Dr. Abowd testified at his deposition that "the determined velocity vector" in the Accused Products is {

}. (RRBr. at 129.) Then, on May 30, 2012, Samsung served

an errata for Dr. Abowd's deposition that sought to change the identity of "the determined velocity vector" {

} an entirely different calculation in a different software module. (*Id.*) Apple emphasizes that throughout this Investigation Dr. Abowd, Dr. Balakrishnan, and Dr. Cole (Samsung's claim construction expert for the '114 patent) all agreed that the "velocity detector" must take position readings periodically and determines a velocity vector from those readings. (*Id.* at 129-130 (citing Tr. (Abowd) at 1669, 1675, (Balakrishnan) at 2661-62; JXM-18 at ¶ 50).) Apple notes that Dr. Abowd admits that if the term "velocity detector" is interpreted using the same construction that he and Dr. Cole used in their reports, Apple does not infringe. (*Id.* at 130 (citing Tr. (Abowd) at 1677, 1679).)

Apple says that Samsung's description of the operation of the Accused Products contradicts the record in multiple ways. First, with regard to {

}. (*Id.* at 130-131 (citing Tr. (Parivar) at 1893-94, (Balakrishnan) at 2637-41, 2646).)

Second, Apple notes that Samsung repeatedly suggests that the Accused Products use { }. (*Id.* at 131 (citing CBr. at 195, 203).) This, argues Apple, is incorrect because the Accused Products {

} (*Id.*)

Third, argues Apple, Samsung incorrectly states that the Accused Products {

}. (*Id.* (citing CBr. at 203-204).) In fact, notes Apple, the Accused Products never {

}. (*Id.* (citing Tr. (Abowd) at 1836-38, (Balakrishnan) at 2637, 2673-76).) Instead, the Accused Products calculate {

}. (*Id.* (citing Tr. (Shaffer) at 1834, 1836-39, (Balakrishnan) at 2659-61).) Apple says that Samsung even asserts that "{

}. (*Id.* at 131-132 (citing CBr. at 195).)

b) Velocity Detector Limitation

Apple points out that Dr. Balakrishnan testified that "one of skill in the art would understand that the claimed velocity detector must, A, take position readings periodically, which

is detecting, and B, determine velocity vectors based on the velocity of that detected motion." (*Id.* at 132 (*Id.* (citing Tr. (Balakrishnan) at 2662).) Apple says that Samsung erroneously argues that Apple cannot rely on this understanding of "velocity vector" because it was not raised during the *Markman* proceedings. (*Id.* (citing CBr. at 191-192, 200-203).) Apple proposes that Samsung's waiver argument is fallacious for four reasons.

First, "velocity detector" was not proposed for construction by Apple or Samsung during the *Markman* proceedings because there was no dispute between the parties in that regard because Apple and Samsung agreed that a "velocity detector" must take position readings periodically and determine a velocity from those reading. (*Id.* (citing JXM-18 at ¶ 50; Tr. (Abowd) at 1668-69; JXM-21 at ¶ 8).) The only relevant description of "velocity detector" in the '114 patent, argues Apple, is the following:

> In the depicted embodiment, during a document drag operation document a velocity detector process takes position readings periodically, such as every centi-second. From these position readings a page velocity determination may be made.

(*Id.* (citing JXM-9 at 14:6-9; Tr. (Abowd) at 1499, 1685-86, (Balakrishnan) at 2661-62).) Citing this description of "velocity detector," Dr. Cole, Samsung's claim construction expert, asserted in his report the same understanding of "velocity detector" that Apple says Samsung now claims that Apple has waived:

> The specification further states that the velocity detector "takes position readings periodically, such as every centi-second. From these position readings a page velocity determination may be made.

(*Id.* (citing JXM-18 at ¶ 50; Tr. (Abowd) at 1668-69).)

Apple argues that, at first, and for much of this Investigation, Dr. Abowd adopted the same understanding of "velocity detector" as Dr. Balakrishnan and Dr. Cole. In his expert report, Dr. Abowd adapted all of Dr. Cole's opinions regarding the '114 patent, including Dr.

Cole's understanding of "velocity detector." (*Id.* at 133 (citing Tr. (Abowd) at 1652-53, 1668-70).) Then, using the same understanding of "velocity detector" as Dr. Cole and Dr. Balakrishnan, Dr. Abowd made the following statement eight times in his rebuttal report to distinguish every prior art reference cited by Apple:

> As the '114 patent explains, the velocity detector must take and use position readings of the user's input periodically. (*See, e.g.,* '114 patent at 14:3-9) The [prior art reference] does not disclose any means or apparatus that periodically captures and calculates the user's detected motion to determine a velocity vector.

(*Id.* (citing Tr. (Abowd) at 1675-76; Abowd Rebut. Rep. ¶¶ 69, 107, 146, 180, 189, 215, 251, 283 (attached App. A)).)

Similarly, and consistent with the parties' agreed definition of "velocity detector," Samsung described the "velocity detector" in its *Markman* briefing as follows: "When the user performs a 'drag operation,' the velocity detector 'takes position readings periodically, such as every centi-second.'" (*Id.* (citing Samsung's opening claim construction brief at 78).) Apple argues that from the briefing and expert reports submitted during the *Markman* proceedings the Administrative Law Judge was led to conclude that "the velocity detector 'takes position readings periodically, such as every centisecond'" in order to determine velocity. (*Id.* (citing Order No. 63 at 122).) Apple says that this remained the state of play concerning the meaning of "velocity detector" until Dr. Abowd claimed on direct examination to have made a "mistake." (*Id.*) Apple argues that Samsung's argument that Apple should have sought a construction of a term not in dispute makes no sense. (*Id.*)

Second, argues Apple, the understanding of "velocity detector" that Samsung now seeks to exclude was expressly considered and relied on in Order No. 63 for construction of the terms "rate based on the determined velocity vector" and "rate based on the determined velocity vector and a page inertia." (*Id.*) In construing these limitations, argues Apple, Order No. 63 relied on

the parties' understanding of "velocity detector" as taking position readings periodically and determining a velocity from those readings as shown here:

> The Administrative Law Judge concludes that Apple's proposed construction is more restrictive than either claim 1 or the specification of the '114 patent indicates. Because the velocity detector takes position readings periodically, from which a page velocity determination may be made (JXM-9 at 14:6-9), there is no requirement that rate be based solely on the last measured vector.
>
> Based on the language of claim 1 and the specification, as discussed by Samsung and Staff, the Administrative Law Judge concludes that the term "rate based on the determined velocity vector" means "rate calculated from the determined velocity vector."

(*Id.* at 133-134 (citing Order No. 63 at 126-127, 131).) Apple says the understanding of "velocity detector" that Dr. Balakrishnan used in forming his non-infringement opinions is the same understanding that Samsung aggressively promoted during the *Markman* proceedings and that Order No. 63 applied in adopting Samsung's proposed construction for "rate based on the determined velocity vector" and "rate based on the determined velocity vector and a page inertia." (*Id.*) Apple argues that Samsung's post-hearing arguments not only attempt to exclude the understanding of "velocity vector" agreed to by all parties during the *Markman* proceedings but actually attempts to exclude the understanding on which Order No. 63 relied in construing the patent. (*Id.* at 134.)

Third, Apple argues that it will be surely prejudiced if Samsung is allowed to introduce its new construction of "velocity detector" (namely, a "process that detects velocity") that was not proposed during the *Markman* proceedings and was not put forth in any expert report. (*Id.*) Apple argues that it is Samsung's new construction of "velocity detector" that should be deemed waived as untimely. (*Id.*) Apple argues that Dr. Cole's reports, Dr. Abowd's reports, and the parties' *Markman* briefing had all interpreted the term "velocity detector" to require taking position readings periodically and determine a velocity from those readings. (*Id.*) Apple says

that at the hearing on June 11, Dr. Abowd asserted for the first time that the understanding of "velocity detector" that he applied in his rebuttal report was a "mistake." (*Id.* (citing Tr. (Abowd) at 1675-77).) Dr. Abowd's assertion that the understanding of "velocity detector" that he and Dr. Cole applied in their expert reports was a "mistake" is neither credible nor timely, and surely does not give Samsung license to introduce a new construction of "velocity detector" at the hearing. (*Id.*) Any testimony from Dr. Abowd regarding applying this new "velocity detector" construction should thus be stricken for violating Ground Rule 9.5.6. (*Id.*)

Fourth, argues Apple, in its post-hearing brief, Samsung strangely argues, for the first time, that the only relevant passage in the '114 patent using the words "velocity detector" somehow does not describe the "velocity detector" in the asserted claims. (*Id.* (citing CBr. at 200-201).) But the passage referred to by Samsung, Apple says, reads as follows:

> In the depicted embodiment, during a document drag operation document a velocity detector process takes position readings periodically, such as every centi-second. From these position readings a page velocity determination may be made.

(*Id.* at 134-135 (citing JXM-9 at 14:6-9; Tr. (Balakrishnan) at 2661-62).) Apple says that in order to justify its new construction, Samsung argues that the phrase "velocity detector process" describes the combination of the "display monitor...," "velocity detector...," and "interface process..." limitations, says Apple. (*Id.* at 135 (citing CBr. at 200-201).) This argument, which Apple says does not appear in any of Dr. Abowd's expert reports or in any of Samsung's *Markman* briefings, is wrong. (*Id.*) Apple argues that if the phrase "velocity detector process" does not refer to the "velocity detector" in the asserted claims, as Samsung claims, then there indisputably would be no written description in the specification of a "velocity detector" used for panning a document, and the claims would be invalid under 35 U.S.C. § 112. (*Id.*) Apple says that there is no intrinsic-evidence support, and Samsung does not cite any, for Samsung's claim

that the "velocity detector process" refers collectively to the "display monitor...," "velocity detector...," and "interface process..." limitations. (*Id.* (citing CBr. at 200-201).) The "interface process" and "display monitor" are never discussed in relation to the "velocity detector" says Apple. (*Id.*) Apple says that both Dr. Cole and Dr. Abowd repeatedly cite this very same passage as describing the "velocity detector" in their reports. (*Id.* (citing Abowd Rebut. Rep. ¶¶ 69, 107, 146, 180, 189, 215, 251, 283; JXM-18 at ¶ 50).) Apple says the direct contradiction between Samsung's new argument and these reports is further evidence that Samsung's new position is not supported in the patent. (*Id.*)

Apple argues that there is no literal infringement under the meaning of "velocity detector" that Dr. Cole, Dr. Balakrishnan, and Dr. Abowd applied in their reports. (*Id.* (citing Tr. at 1677-79(Abowd), 2667-68 (Balakrishnan)).) Apple argues that, faced with that fatal deficiency, Samsung and Staff try to argue that the UIPanGestureRecognizer determines a velocity vector "based on a velocity of the detected motion." (*Id.* (citing CBr. at 202-203; SBr. at 115-116, 118).) Apple says Samsung's and Staff's arguments in that respect are wholly at odds with the factual record because {

}. (*Id.* (citing Tr. at 1878, 1886-87, 1895 (Parivar), 2637 (Balakrishnan)).) Apple says this is undisputed. (*Id.* (citing Tr. at 1697, 1702, 1704 (Abowd)).) {

} (*Id.* (citing Tr. at 1893-94 (Parivar), at 2637-42, 2668 (Balakrishnan)).)

Apple says that because {

}. (*Id.* (citing Tr. at 1893-94 (Parivar), 2637-41, 2646 (Balakrishnan)).)

Apple says that testing data confirms that {

}. (*Id.* at 137.) Apple says the UIPanGestureRecognizer source code itself states that { } (*Id.* (citing

RX-0533C at 3842).) Apple says that because the {

} (*Id.*) Apple argues that Samsung incorrectly contends the "merely operating the iPhone 4S" demonstrates that the "velocity vector determined by UIPanGestureRecognizer will…be based on the velocity of the user's detected motion" because "if the finger moves fast, the web page is panned faster in the direction of the user's finger." (*Id.* (citing CBr. at 203.) Apple notes that in support of this statement Samsung cites testimony related to Dr. Abowd moving his fingers faster and slower while in contact with the touch screen. (*Id.*) But, according to Apple, it is undisputed that the source code proves that the Accused Products never use {

}. (*Id.*)

As for Samsung's arguments that the Accused Products infringe under the doctrine of equivalents, Apple reasserts its contention that Samsung is barred by prosecution history estoppel from marking this assertion. (*Id.*) Apple says Samsung does not dispute that the amended limitations in claim 50, which include "velocity detector," before the PTO, gives rise to the presumption of estoppel, but, rather, argues that the presumption is rebutted because the "rationale underlying the narrowing amendment bore no more than tangential relation to the equivalent in question." (*Id.* (citing CBr. at 206).) Apple says Samsung's argument fails for several reasons.

First, pursuant to Ground Rule 7.2, Samsung has waived any "tangential exception" argument because it was not raised in Samsung's pre-hearing brief. (*Id.*) Second, Apple argues that Samsung cannot rebut the presumption expressed in *Festo,* 553 U.S. at 736. (*Id.*) Apple argues that "[t]he tangential relation criterion for overcoming the *Festo* presumption is very narrow." (*Id.* (citing *Honeywell Intern., Inc. v. Hamilton Sundstrand Corp.*, 523 F.3d 1304, 1315 (Fed. Cir. 2008); *Felix,* 562 F.3d at 1184 ("the patentee bears the burden of showing that a narrowing amendment did not surrender a particular equivalent.")).) Quoting from *Honeywell*, at 1315, Apple says "[t]he inquiry into whether a patentee can rebut the *Festo* presumption under the 'tangential' criterion focuses on the patentee's objectively apparent reason for the narrowing amendment[, which must be] discernible from the prosecution history record." (*Id.*) "If the prosecution history reveals no reason for the narrowing amendment, the presumption is not rebutted." (*Id.*)

Apple argues that Samsung has not identified any "objectively apparent reason" for the "velocity detector" as it is required to do under *Felix*, 562 F.3d at 1184. (*Id.*) Apple says the only part of the file history that Samsung points to is the following:

> The Applicant argued that Ho and Moran fail to describe a computing device that causes the engine to render a series of pages at a rate that is determined based on a detected velocity associated with a motion that triggered the command and based on a page inertia. [citing RX-1658 at 3276] The examiner allowed claim 50 to issue on that basis. (RX-1658 at Samsung-AppleITC003297).

(*Id.* at 138-139 (citing CBr. at 207).) Apple argues that the presumption of estoppel cannot be rebutted by the tangential exception on the basis of these facts. (*Id.* at 139.) Apple argues that the Federal Circuit has specifically stated that "an amendment made to avoid prior art that contains the equivalent in question is not tangential; it is central to allowance of the claim." (*Id.* (quoting *Festo*, 344 F.3d at 1369.) Apple says that Samsung admits, as it must, that the

amendments were made to overcome prior art rejections. (*Id.* (citing CBr. at 206 ("[T]he applicant added new claim 50 to overcome two prior art references—Ho and Moran.")).) Apple says there is also no dispute that claim 50 added the "velocity detector" limitation, which is the "equivalent in question." (*Id.* (citing Tr. at 1660-61 (Abowd); RX-1658 at 3269-70).) Apple points out that Samsung admits that the applicant argued that the feature of rendering pages "at a rate that is determined based on a detected velocity associated with a motion" distinguishes claim 50 from Ho and Moran. (*Id.*) Apple argues that because the "velocity detector" limitation is the portion of claim 50 that detects the velocity associated with the motion, the amendment adding "velocity detector" was central to the allowance of claim 50, which issued as claim 1. (*Id.* at 139-140.) Therefore, argues Apple, the presumption of estoppel cannot be rebutted by the tangential exception. (*Id.* at 140.)

Apple repeats its argument that Samsung's doctrine of equivalents defense should be stricken because Dr. Abowd's opinions on this topic were not disclosed in his expert report or deposition testimony as required under Ground Rule 9.5.6. (*Id.*) Apple says it is being prejudiced by this new theory regarding application of the doctrine of equivalents. (*Id.*) Apple argues that even if Samsung were entitled to argue the doctrine of equivalents, the Accused Products do not satisfy the "velocity detector" limitation by reason of that doctrine. (*Id.*) Apple contends that Samsung's opening post-hearing brief does not offer any analysis of the "function," thereby implicitly conceding that the alleged "velocity detector" in the Accused Products, UIPanGestureRecognizer, does not perform substantially the same "function" as this limitation. (*Id.* (citing CBr. at 223-224).)

Apple says the Accused Products do not perform substantially the same "way" as the "velocity vector" limitation in the '114 patent. (*Id.*) Apple says Samsung incorrectly asserts that

the Accused Products perform substantially the same "way" {

}. (*Id.* (citing CBr. at 205).)

Apple argues that the Accused Products do not operate in this "way." (*Id.*) Calculating a velocity based on the detected motion requires that the time corresponding to each position is known. (*Id.* at 140-141.) According to Apple, {

}. (*Id.* (citing Tr. at 2649, 2656-58 (Balakrishnan)).)

Apple says the Accused Products do not achieve substantially the same "result" as the "velocity detector." Apple notes that Samsung's post-hearing brief asserts that "the accused products achieve substantially the same result {

}" (*Id.* (citing CBr. at 206).) Apple says, however, that this is not the "result" of the "velocity detector," which is to calculate a velocity vector based on the actual velocity of the user's pointer on the touch-sensitive display. (*Id.*) Apple argues that, because the {

}. (*Id.* at 141-142 (citing RX-0365; Tr. at 2649, 2656-58, 2670-71 (Balakrishnan)).) Thus, according to Apple, the

UIPanGestureRecognizer does not achieve the same "result" as the "velocity detector," because { } (*Id.*)

Apple contends that the Accused Products { } (*Id.* at 142.) According to Apple, Samsung does not even address Apple's non-infringement arguments with regard to the "rate based on the determined velocity vector" limitation in is post-hearing brief. (*Id.*) Apple argues that after failing to identify "the determined velocity vector" in the Accused Products in his expert reports, Dr. Abowd testified at his deposition that "the determined velocity vector" corresponds to { }. (*Id.* (citing Tr. at 1733 (Abowd), 2672 (Balakrishnan)).) This testimony is fatal to Samsung's claims, argues Apple, because if "the determined velocity vector" is the { }, as Dr. Abowd testified at his deposition, it is undisputed that the Accused Products do not infringe because "the determined velocity vector" (i.e., { }) is not determined by the alleged "velocity detector" (i.e., UIPanGestureRecognizer) as required by the asserted claims. (*Id.* at 142-143 (citing Tr. at 1733-35, 1737-38 (Abowd), 2672-73 (Balakrishnan)).) Further, argues Apple, neither Samsung nor Dr. Abowd offered any testimony or argument regarding the doctrine of equivalents for the "rate based on the determined velocity vector" limitation. (*Id.* at 143.)

6. Findings and Conclusions.

The Administrative Law Judge concludes that the evidence does not demonstrate, to a preponderate degree, that the Accused Products infringe any of the asserted claims of the '114 patent. In order to establish infringement, the complainant must demonstrate that the accused devices or methods meet all of the limitations of the asserted claims. The evidence does not

demonstrate that the Accused Products satisfy the following limitation: "a velocity detector for determining a velocity vector based on a velocity of the detected motion." (JXM-9 at 16:16-19.)

Samsung accuses the iPhone 3GS, iPhone 4, iPhone 4S, iPad 2, and iPod Touch products that run on iOS 5.0 of infringing claims 1-5. All of the Accused Products running iOS 5 operate in the same manner with regard to the functionalities relevant to the '114 patent. (Tr. at 1904-05 (Parivar).) The Accused Products include touch hardware that has a capacitive touch panel with sensors that can detect a user's touch by sensing the change in capacitance at different locations. (Tr. at 1875 (Parivar), 2636 (Balakrishnan).) {

} (*Id.*) Detecting gestures, such as scrolling, is more complex in a multi-touch system, like the Accused Products, than in a single-touch system. (Tr. (Shaffer) at 1831-33, (Parivar) at 1882-83).) In a single-touch system, the device only has to track the position of a single pointer and detect a single command at a time; however, in a multi-touch system, the software must be able to track several different fingers on the touch screen at the same time, and make decisions about which fingers are involved in which gestures, because a multi-touch system can recognize multiple gestures at the same time. (Tr. (Shaffer) at 1831-32, (Parivar) at 1882-83.)

Claim 1 specifies "a velocity detector for determining a velocity vector, based on a velocity of the detected motion. (JXM-9 at 16:16-17.) The antecedent for the term "the detected

motion" is in the preceding limitation of claim 1: "a display monitor in communication with the touch-sensitive display screen for detecting motion of a pointer across the touch-sensitive display[.]" (*Id.* at 16:13-15.) What Samsung describes as the "velocity detector" in the Accused Products is UIPanGestureRecognizer. (Tr. (Abowd) at 1734-35.) However, the UIPanGestureRecognizer does not determine a velocity vector "based on a velocity of the detected motion" (claim 1) or "associated with the detected motion" (claim 3). Velocity and motion are characterized by both position and time. (*Id.*) To calculate a velocity "based on a velocity of the detected motion" or "associated with the detected motion," one would have to know the position of the pointer at particular points in time. (*Id.*) The firmware in the Accused Products {

}. (Tr. (Parivar) at 1877-78, (Balakrishnan) at 2636-37, 2643, 2648.) {

}. (*Id.* at 130-131 (citing Tr. (Parivar) at 1893-94, (Balakrishnan) at 2637-41, 2646).)

The recitation in the asserted claims of "a velocity of the detected motion" (JXM-9 at 16:17, 16:45-46) conveys the fact that velocity can vary during the course of the motion that is being detected. But, nevertheless, it is a velocity—out of a range of possible velocities—of the detected motion of the display monitor, in communication with the touch-sensitive display screen, that the velocity detector determines, according to the claims. (*See* JXM-9 at 16:13-17, 16:45-46.) However, in the case of the Accused Products, the {

}

The evidence relied on by Samsung for its proof of infringement, in reliance on the testimony of Dr. Abowd with respect to the velocity detector in the Accused Products identified by him, does not demonstrate that that "velocity detector" actually determines a velocity vector that is based on a velocity of the detected motion of the display monitor. The velocities that the velocity detector that is identified by Dr. Abowd determines are based on other criteria.[46] {

[46] The term "based" is defined as: " 1. to make, form, or serve as a base for 2. to find a base or basis for—usu[ally] used with *on* or *upon*" (*Merriam-Webster's Ninth New Collegiate Dictionary* (1985). It is the second sense that the term is found to apply to the claims, because they use the phrase "based on."

}

The Administrative Law Judge finds that the principal evidence relied on by Samsung for its proof of infringement, the expert opinions provided by Dr. Abowd, is not reliable. The argument and discussion set forth by Apple above reveals that Dr. Abowd has shifted positions regarding his expert opinions, undermining the lastingness of those opinions and the conviction with which he expresses them. Dr. Abowd, as well as Dr. Cole and Dr. Balakrishnan, all said that the "velocity detector," as it is recited in the claims must take position reading periodically to determine the velocity from those reading. (Tr. (Abowd) at 1669, 1675, (Balakrishnan) at 2661-62.) Dr. Abowd said so eight separate times in his expert report.

> As the '114 patent explains, the velocity detector must take and use position readings of the user's input periodically. (*See, e.g.,* '114 patent at 14:3-9) The [prior art reference] does not disclose any means or apparatus that periodically captures and calculates the user's detected motion to determine a velocity vector.

(Tr. (Abowd) at 1675-76; RRBr. App. A (Abowd Rebut. Rep.) at ¶ 69, 107, 146, 180, 189, 215, 251, 283.) These statements are specific and unequivocal—"the velocity detector must take and use position readings of the user's input periodically"—and were relied upon in Order No. 63 in construing the claims. (Order No. 63 at 126, 127.) The Administrative Law Judge finds that Dr. Abowd's testimony at the hearing, and Samsung's position now, that a person of ordinary skill in the art would understand velocity detector to mean something that determines a velocity vector, not something that "takes position readings," is materially different from Dr. Abowd's expert report and Samsung's contention in the *Markman* proceedings. The passage quoted above is but

one of eight instances that Dr. Abowd's expert report says that the velocity detector must take and use position readings of the user's input periodically.

Even though Apple did not seek construction of the term "velocity detector," as Samsung points out, Dr. Abowd's testimony at the hearing was contrary to his statements in his expert report and is therefore impermissible under the Ground Rule 9.5.6. Furthermore, Samsung is estopped from advocating a different position now. Samsung took a position in the *Markman* proceedings with respect to the construction of the claim term "rate based on the determined velocity vector" which advocated that because the velocity detector takes position readings periodically from which a page velocity detector "takes position readings periodically, such as every centi-second." (Order No. 63 citing CMBr. at 78.) The Administrative Law Judge ruled in Order No. 63 as follows:

> The Administrative Law Judge concludes that Apple's proposed construction is more restrictive than either claim 1 or the specification of the '114patent indicates. Because the velocity detector takes position readings periodically, from which a page velocity determination may be made (JXM-9 at 14:6-9) there is no requirement that the rate be based solely on the last measured velocity vector.
>
> Based on the language of claim 1 and the specification, as discussed by Samsung and Staff, the Administrative Law Judge concludes that the tern "rate based on the determined velocity vector" means "rate calculated from the determined velocity vector."

(Order No. 63 at 126-127.) Samsung took a position in arguing for claim construction of the claim term "rate based on the determined velocity detector" that the velocity detector "takes position readings periodically, such as every centi-second," and in so doing, prevailed in the claim construction it proposed. Therefore Samsung is estopped from asserting a different construction for the term "velocity detector." *CRV Enterprises, Inc. v. U.S.*, 626 F.3d 1241, 1248-49 (Fed. Cir. 2010). Dr. Abowd's testimony at the hearing is clearly inconsistent with Samsung's contention during the *Markman* proceedings. (Tr. (Abowd) at 1675-77.) Samsung

succeeded in achieving its proposed claim construction for the term "rate based on the determined velocity detector." Samsung would derive an unfair advantage were it allowed to change its position at the hearing in light of its prior position. Therefore, Samsung and Dr. Abowd are bound by the position that they took prior to the hearing, not only as expressed by Dr. Abowd but by Dr. Cole, too. In addition, the Administrative Law Judge concludes that Apple has not waived its right to argue that the claimed "velocity detector" takes periodic readings, given that this was the contention of all parties, including Staff.

Dr. Abowd changed his position on crucial issues more than once. After he was deposed, and five days before the hearing, he submitted the errata noted here: {

}
(RBr., Ex. 4 at 1 (Abowd Dep. Tr. Errata).) This so-called "errata"[47] is not a transcription error but, instead, a retraction of what Dr. Abowd had testified under oath, with no apparent evidence of uncertainty, hesitation, or ambivalence:

> Q. Can you give me any name at all about what you are calling the determined velocity detector in the accused Apple products?
>
> A. Yes, I can, and the name I would give you is {
> }

(CBr., Ex. 3 (Abowd Dep.) (Apr. 25, 2012) at 475.) This is a substantive change in testimony, not an error in transcription. Commission Rule 210.28 provides that "[e]rrors and irregularities in the manner in which the testimony is transcribed or the deposition is prepared, signed,

[47] "Errata" is the plural of "erratum," which is defined as "[a]n error in printing or writing, especially such an error in a list of corrections and bound into a book." (*The American Heritage Dictionary of the English Language* (2011).

certified, sealed, indorsed, transmitted, served or otherwise dealt with by the person before whom it is taken are waived unless a motion to suppress the deposition or some part thereof is made with reasonable promptness after such defect is, or with due diligence might have been, ascertained." Thus, this does not authorize substantive changes, and furthermore, there is no demonstration of the exercise of due diligence on the part of Dr. Abowd or Samsung in submitting the "errata." In *Delaware Valley Floral Group, Inc. v. Shaw Rose Nets, LLC* 597 F.3d 1374, 1380 (Fed. Cir. 2010), the court sustained a district court judge's exclusion of an untimely errata sheet that constituted a substantive change in the deponent's testimony. The court noted that is unclear whether Fed. R. Civ. P. 30 (e) allows substantive changes to deposition testimony through an errata sheet, but if it does, it does not require them. Rule 30 (e) does not govern this Investigation, and Samsung has not cited any authority for allowing a substantive change in a deponent's testimony by way of an errata. Therefore, the Administrative Law Judge concludes that what Dr. Abowd testified at his deposition stands and contradicts his testimony at the hearing and, therefore, is impeaching.

Samsung dismisses this conflicting testimony of Dr. Abowd as inconsequential by saying that Dr. Abowd's expert report is consistent with the errata revision, providing the following excerpt: {

}
(CRBr. at 145 (citing Ex. 11 at ¶144 (Abowd Rep.)).) However, this does not explain how Dr. Abowd came to give this answer: "Yes, I can, and the name I would give you is {

}. (CBr. Ex. 3 at 475 (Abowd Dep.).) The fact that Dr. Abowd could affirm his ability to answer the interlocutor's question with such specificity at his deposition raises questions about his familiarity with the expert report that bears his signature, given the discrepancy between the two on this significant and pivotal point.

Dr. Abowd admitted that if { } are the velocity vector in the Accused Products, as he had testified at his deposition, the Accused Products do not infringe the '114 patent. (Tr. (Abowd) at 1737-38.) Given this acknowledgement and the fact that Dr. Abowd's testimony in general has been inconsistent and unreliable on material issues, the Administrative Law Judge concludes that the evidence pointed to by Samsung does not demonstrate to a preponderate degree that the Accused Products satisfy the limitation "a rate based on the determined velocity detector."

With respect to the remaining limitations of claims 1 and 3, and the evidence relied on by Samsung, as previously described, the Administrative Law Judge concludes that the evidence is sufficient to demonstrate, to a preponderate degree, that the Accused Products satisfy those limitations insofar as they may be considered individually and separate from those limitations the evidence for which has been determined herein not to support a finding of infringement, as previously discussed.

With respect to the issue whether the Accused Products infringe under the doctrine of equivalents, the Administrative Law Judge denies Apple's request to strike Samsung's evidence in that regard. Although the excerpts in Dr. Abowd's reports that Apple points to do not parallel verbatim the testimony Dr. Abowd gave at the hearing, as set out by Apple and discussed above,

they are sufficiently corresponding in substance to satisfy due process notice requirements for admissibility and consideration in this Investigation.

The Administrative Law Judge concludes that the evidence does not demonstrate to a preponderate degree that the Accused Products infringe the claims of the '114 patent under the doctrine of equivalents, as alleged by Samsung. The Accused Products do not perform substantially the same function as the "velocity detector" limitation as opined by Dr. Abowd, who testified as follows with respect to the alleged velocity detector in the Accused Products:

{

}

(Tr. at 1602 (Abowd).) Dr. Abowd's assumption that {

} is not demonstrated by the evidence. (Tr. at 2669-70 (Balakrishnan).) Dr. Abowd acknowledges that he does not know one way or the other whether {

}. (Tr. at 2649, 2656-58, 2669-70 (Balakrishnan).) Therefore, Dr. Abowd's assumption that {

} is not demonstrated.

The evidence does not demonstrate to a preponderate degree that the Accused Products perform substantially the same way as the "velocity detector" limitation. Dr. Abowd gave this testimony at the hearing:

Q. Why is it doing it substantially the same way?
A. {

}

(Tr. (Abowd) at 1602.) Dr. Abowd's analysis is disputed by Dr. Balakrishnan. (Tr. (Balakrishnan) at 2607.) Calculating a velocity from the detected motion using a change in the X components over time requires that the time corresponding to each X position be known. The Accused Products do not operate this way. (Tr. (Shaffer) at 1835-36, (Balakrishnan) at 2641-42, 2668).) {

} (Tr. (Balakrishnan) at 2649, 2656-58, 2670; RX-0365.)

The Accused Products do not achieve substantially the same result as the "velocity detector" limitation because the proper "result" of the "velocity detector" limitations is to calculate the actual velocity of the user's pointer on the touch-sensitive display; however, {

}

The Administrative Law Judge concludes that prosecution history estoppel precludes Samsung's doctrine of equivalents contention. (*Festo*, 535 U.S. at 736. According to the evidence, during prosecution of the '114 patent, the examiner rejected pending claim 1 as "unpatentable over US Patent # 5,909,207 ("Ho") in view of US Patent # 6,525,749 ("Moran et al.")." (Tr. (Abowd) at 1664; RX-1658 at 3250.) The prosecution history shows that the applicant cancelled application claim 1 and submitted claim 50, which reads as follows, with added limitations shown by the underlined portions:

> **50**. A computer device having a system for simulating tactile control over a document, comprising:
>
> a processor, memory, and a touch-sensitive display,
>
> system code stored within the memory and adapted to be executed by the processor to provide a digital representation of a document including data content and a page structure representative of a page layout of the document,
>
> an engine for rendering an image of at least a portion of the page layout of the digital representation on the touch sensitive display,
>
> a display monitor in communication with the touch-sensitive display screen for detecting motion of a pointer across the touch sensitive display,
>
> a velocity detector for determining a velocity vector associated with the detected motion,
>
> an interface process in communication with the display monitor for processing the motion detected by the display monitor to detect one of a plurality of commands,
>
> wherein the plurality of commands includes a pan command, wherein, in response to the command detected by the interface process being the pan command, the engine renders a series of pages of the document on the touch-sensitive display at a rate based on the determined velocity vector and a page inertia.

(RX-1658 at 3269-70.) The applicant expressly argued that these amendments distinguished added claim 50 (issued claim 3) from the Ho and Moran references, which had been reasons why the examiner rejected pending claim 1: "With respect to new independent claim 50, Ho and Moran both fail to describe a computing device that can detect and execute a command that

causes an engine to render a series of pages at a rate that is determined based on a detected velocity associated with a motion that triggered the command and based on page inertia." (RX-1658.) The prosecution history shows that the examiner allowed claim 50 for the following reason: "Independent claim 50 identifies a uniquely distinct feature 'in response to the command detected by the interface process being the pan command, the engine renders a series of pages of the document on the display at a rate based on the determined velocity vector and a page inertia.'" (*Id.* at 3297.) Samsung argues that the velocity detector was not narrowed and that there was no surrender with respect to the scope of the velocity detector. However, according to the claim, the engine does this "based on a determined velocity vector and a page inertia." The "determined velocity vector" is based on "a velocity of the detected motion," which is of "a pointer across the touch-sensitive display." Therefore, the claimed velocity detector that does this is inextricably associated with the velocity of the detected motion, which excludes the velocity calculated by the alleged "velocity detector" of the Accused Products. The patentee narrowed the claim in several ways in order to overcome Ho and Moran, specifically noting that they "fail to describe a computing device that can detect and execute a command that causes an engine to render a series of pages at a rate that is determined based on a detected velocity associated with a motion that triggered the command and based on page inertia." (RX-1658.) Therefore, the presumption of surrender of the equivalent at issue with respect to the Accused Products applies. *Felix*, 562 F.3d at 1182-83.

For the foregoing reasons, the Administrative Law Judge concludes that the evidence does not demonstrate, to a preponderate degree, that Accused Products infringe claims 1 and 3 of the '114 patent. Since the remaining claims, 2, 4, and 5, depend from either claim 1 or claim 3, the evidence likewise does not demonstrate, to a preponderate degree, that the Accused Products

infringe those dependent claims, for the same reasons. Insofar as there are additional elements of the dependent claims that are not included in claims 1 and 3, Apple has not specifically addressed them and is deemed to have waived opposition to Samsung's allegations. The evidence cited by Samsung with respect to the additional limitations of claims 2, 4, and 5, discussed above, is sufficient to demonstrate, to a preponderate degree, that those elements are included in the Accused Products, except insofar as they depend upon other elements in claims 1 and 3 the presence of which the evidence has been found lacking.

V. VALIDITY

A. Background

One cannot be held liable for practicing an invalid patent claim. *See Pandrol USA, LP v. AirBoss Railway Prods., Inc.*, 320 F.3d 1354, 1365 (Fed. Cir. 2003). However, patent claims are presumed valid. 35 U.S.C. § 282. A respondent that has raised patent invalidity as an affirmative defense must overcome the presumption by "clear and convincing" evidence of invalidity. *Checkpoint Systems, Inc. v. United States Int'l Trade Comm'n*, 54 F.3d 756, 761 (Fed. Cir. 1995). Further, as stated by the Federal Circuit in *Ultra-Tex Surfaces, Inc. v. Hill Bros. Chem. Co.*:

> when a party alleges that a claim is invalid based on *the very same references* that were before the examiner when the claim was allowed, that party assumes the following additional burden:
>
> When no prior art other than that which was considered by the PTO examiner is relied on by the attacker, he has the added burden[48] of overcoming the deference that is due to a qualified government agency presumed to have properly done its job, which includes one or more examiners who are assumed to have some expertise in interpreting the references and to be familiar from their work with the level of skill in the art and whose duty it is to issue only valid patents.

[48] This is not an added burden of proof but instead goes to the weight of the evidence. *Sciele Pharma v. Lupin Ltd.*, 684 F.3d 1253, 1260 (Fed. Cir. 2012). New evidence not considered by the PTO may carry more weight than evidence previously considered by the PTO. (*Id.*)

Ultra-Tex Surfaces, Inc. v. Hill Bros. Chem. Co., 204 F.3d 1360, 1367 (Fed. Cir. 2000) (emphasis added) (quoting *American Hoist & Derrick Co. v. Sowa & Sons, Inc.*, 725 F.2d 1350, 1359 (Fed. Cir. 1984) "*American Hoist*").

1. Anticipation.

A determination that a patent is invalid as being anticipated under 35 U.S.C. § 102 requires a finding, based upon clear and convincing evidence, that each and every limitation is found either expressly or inherently in a single prior art reference. *See Celeritas Techs. Inc. v. Rockwell Int'l Corp.*, 150 F.3d 1354, 1361 (Fed. Cir. 1998). Anticipation is a question of fact, including whether a limitation, or element, is inherent in the prior art. *In re Gleave*, 560 F.3d 1331, 1334-35 (Fed. Cir. 2009). The limitations must be arranged or combined the same way as in the claimed invention, although an identity of terminology is not required. Id. at 1334 ("the reference need not satisfy an ipsissimis verbis test"); MPEP § 2131.

In addition, the prior art reference's disclosure must enable one of ordinary skill in the art to practice the claimed invention "without undue experimentation." *Gleave*, 560 F.3d at 1334-35. A prior art reference that allegedly anticipates the claims of a patent is presumed enabled; however, a patentee may present evidence of nonenablement to overcome this presumption. *Impax Labs., Inc. v. Aventis Pharmaceuticals Inc.*, 468 F.3d 1366, 1382 (Fed. Cir. 2006). "[W]hether a prior art reference is enabling is a question of law based upon underlying factual findings." Gleave, 560 F.3d at 1335.

2. Obviousness

Under 35 U.S.C. § 103(a), a patent is valid unless "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made" to a person having ordinary skill in the

art. 35 U.S.C. § 103(a). The ultimate question of obviousness is a question of law, but "it is well understood that there are factual issues underlying the ultimate obviousness decision." *Richardson-Vicks Inc. v. Upjohn Co.*, 122 F.3d 1476, 1479 (Fed. Cir. 1997) (citing *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17 (1966) ("*Graham*")).

After claim construction, "[t]he second step in an obviousness inquiry is to determine whether the claimed invention would have been obvious as a legal matter, based on underlying factual inquiries including: (1) the scope and content of the prior art, (2) the level of ordinary skill in the art, (3) the differences between the claimed invention and the prior art; and (4) secondary considerations of non-obviousness." *Smiths Indus. Med. Sys., Inc. v. Vital Signs, Inc.*, 183 F.3d 1347, 1354 (Fed. Cir. 1999) (citing *Graham*, 383 U.S. at 17). The existence of secondary considerations of non-obviousness does not control the obviousness determination: a court must consider "the totality of the evidence" before reaching a decision on obviousness. *Richardson-Vicks*, 122 F.3d at 1483.

The Supreme Court clarified the obviousness inquiry in *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 389 (2007) ("*KSR*"). The Supreme Court said:

> When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. *Sakraida* and *Anderson's-Black Rock* are illustrative–a court must ask whether the improvement is more than the predictable use of prior art elements according to their established functions.
>
> Following these principles may be more difficult in other cases than it is here because the claimed subject matter may involve more than the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for the improvement. Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands

> known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis should be made explicit.
> * * *
> The obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasis on the importance of published articles and the explicit content of issued patents. The diversity of inventive pursuits and of modern technology counsels against limiting the analysis in this way. In many fields it may be that there is little discussion of obvious techniques or combinations, and it often may be the case that market demand, rather than scientific literature, will drive design trends. Granting patent protection to advances that would occur in the ordinary course without real innovation retards progress and may, in the case of patents combining previously known elements, deprive prior inventions of their value or utility.

KSR, 550 U.S. at 417-19.

The Federal Circuit has since held that when a patent challenger contends that a patent is invalid for obviousness based on a combination of several prior art references, "the burden falls on the patent challenger to show by clear and convincing evidence that a person of ordinary skill in the art would have had reason to attempt to make the composition or device, or carry out the claimed process, and would have had a reasonable expectation of success in doing so." *PharmaStem Therapeutics, Inc. v. ViaCell, Inc.*, 491 F.3d 1342, 1360 (Fed. Cir. 2007) (citations omitted).

> The TSM[49] test, flexibly applied, merely assures that the obviousness test proceeds on the basis of evidence--teachings, suggestions (a tellingly broad term), or motivations (an equally broad term)--that arise before the time of invention as the statute requires. As *KSR* requires, those teachings, suggestions, or motivations need not always be written references but may be found within the knowledge and creativity of ordinarily skilled artisans.

Ortho-McNeil Pharmaceutical, Inc. v. Mylan Laboratories, Inc., 520 F.3d 1358, 1365 (Fed. Cir. 2008).

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[49] Teaching, suggestion, motivation.

B. Analysis

1. '348 Patent.

Apple alleges that the asserted claims of the '348 patent are invalid in light of prior art. (RBr. at 50.) Apple argues that the ETSI[50], as of June 1999, imposed the following constraints for TFCI encoding: (1) the need to encode up to 10 bits of information, and (2) the limitation of transmission of the codeword to 30 bits per frame. (*Id.* (citing Tr. (Min) at 3057-58, (Davis) at 1983-84).)[51] According to Apple, Reed-Muller codes[52] were the only codes that had ever been used for encoding TFCI information. (*Id.*) Apple says that for that reason it would have been obvious for a person of ordinary skill in the art to turn to the MacWilliams text[53], which was considered to be the "Bible" of error correcting codes, in order to adopt the June 1999 Standard, using the routine application of known techniques. (*Id.* (citing Tr. (Davis) at 1991-93).) Apple says that the June 1999 Standard and MacWilliams together disclose all of the elements of the asserted claims and therefore render those claims invalid for obviousness. (*Id.* at 50-51.)

a) Apple's invalidity assertions based on obviousness under 35 U.S.C. § 103.

(1) *Claim 75*

(a) *"a controller for outputting"*[54]

Apple maintains that the evidence demonstrates that the June 1999 Standard and the MacWilliams text disclose a controller for outputting. (*Id.* at 51 (citing Tr. (Davis) at 2017).) Dr. Davis alluded to RDX-11-19 which cites Section 4.3.1.2 of the 1999 Standard (RX-0371C, §

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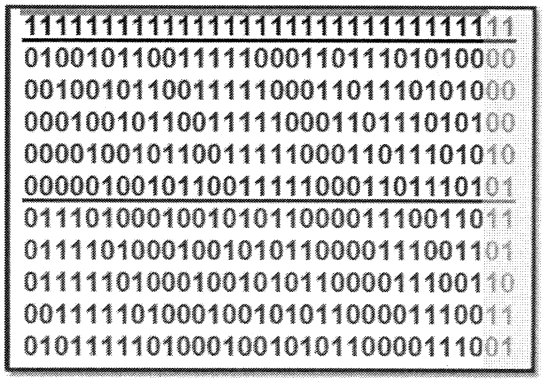
[50] European Telecommunications Standards Institute. (RX-374 at APL794-80000005315.)
[51] Apple bases this on what is referred to as the "June 1999 Standard," consisting of RX-371 and RX-374. (RBr. at 50, n. 10.)
[52] One of the coding techniques described in *The Theory of Error-Correcting Codes*, a textbook on encoding.
[53] A shorthand reference to the textbook *The Theory of Error-Correcting Codes* (1977), authored by F.J MacWilliams and N.J.A. Sloane. (RXM-33.)
[54] The term "a controller for outputting" is construed according to its plain and ordinary meaning. (Markman Order at 17.)

4.3.1.2; RX-0374, §5.4.1) and Corollary 17 of MacWilliams (RX-0367 at APL794-A0000076750) as his basis for this contention.

(b) *"a 30 bit codeword from among a plurality of 30 bit codewords"*

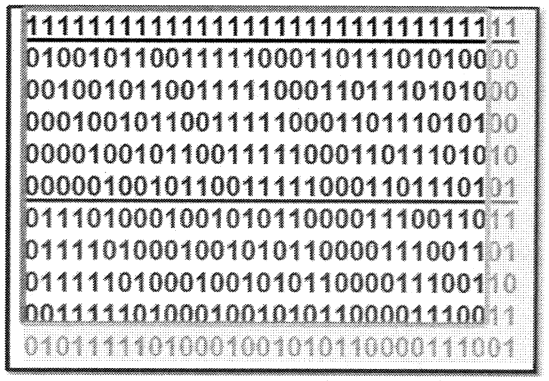
Apple says that MacWilliams discloses outputting a 30-bit codeword from among a plurality of 30-bit codewords. (*Id.* (citing Tr. (Davis) at 2017).) Apple notes that Dr. Davis testified that MacWilliams discloses the length 32 basis sequences for Reed-Muller codes, and Apple argues that in order to generate 30-bit codewords one would simply use 30 of the columns, delineated below from the MacWilliams textbook, rather than 32 columns. (*Id.* (citing Tr. (Davis) at 2017).) For example, as Dr. Davis testified at the hearing, one could delete or remove two columns from the basis sequence disclosed in Corollary 17 as depicted below, where the colors of the last two columns are faded.



(*Id.* (citing Tr. (Davis) at 2017 and RDX 11-21).) Apple says that, by puncturing the basis sequences at two of the bit positions, the controller will output a 30-bit codeword instead of a 32-bit codeword. (*Id.* (citing Tr. (Davis) at 2017 and RDX 11-21).)

(c) *"that corresponds to a 10 bit TFCI information input to the controller from a plurality of possible 10 bit TFCI information"*

Apple says the evidence demonstrates that the June 1999 Standard and MacWilliams both disclose a controller for outputting a codeword that corresponds to a 10-bit TFCI information input to the controller from a plurality of possible 10-bit TFCI information. (*Id.* at 51-52 (citing Tr. (Davis) at 2017-18).) Additionally, MacWilliams discloses encoding a 10-bit input representing TFCI information, or anything else, using 10 basis sequences. (*Id.* (citing Tr. (Davis) at 2017-18).) For example, as Dr. Davis demonstrated, to encode a 10-bit input, one can simply use 10 basis sequences disclosed in Corollary 17, instead of all of the 11 sequences available, as indicated by the circumscribed segment shown here:



(*Id.* at 52.) Simply by using 10 rows and 30 columns from the Corollary 17 basis sequences, the controller will accept a 10-bit input and will output a corresponding 30-bit codeword. (*Id.*)

(d) *"wherein the 30 bit codeword output by the controller is equivalent to a 32 bit codeword that corresponds to the 10 bit TFCI information input to the controller"*

Apple says the evidence also demonstrates that both the June 1999 Standard and MacWilliams disclose this limitation. (*Id.* (citing Tr. (Davis) at 2018).) Dr. Davis testified that this limitation requires 32-bit codewords with a minimum distance of at least 3, so that 30-bit codewords will maintain a one-to-one correspondence with any possible input sequences. (*Id.*

(citing Tr. (Davis) at 2018).) For example, the length 32 basis sequences from Corollary 17 have a minimum distance of 12, which is the optimal minimum distance, so using 30 of the 32 columns will yield 30-bit codewords that are equivalent to the 32-bit codewords. (*Id.* (citing Tr. (Davis) at 2018, 1988-89).) According to Apple, Dr. Davis testified that the Reed-Muller codes in the June 1999 Standard and in MacWilliams also meet this requirement. (*Id.* at 52-53 (citing Tr. (Davis) at 2018).)

(2) *Claim 76*

> (a) *"wherein each of the plurality of possible 10 bit TFCI information and each of the plurality of 30 bit codewords correspond to each other based on a combination of a basis orthogonal sequence, a basis mask sequence, and an all "1" sequence"*

Dr. Davis testified that this limitation requires that the code make use of a first-order Reed-Muller code basis, which is a combination of sequences of all ones and basis orthogonal sequences, augmented with basis mask sequences. (*Id.* at 53 (citing Tr. (Davis) at 1989).) Apple says that each of the examples of sub-codes of second-order Reed-Muller code disclosed in MacWilliams, discussed by Dr. Davis during his testimony, has this property. (*Id.* (citing Tr. (Davis) at 2018-19).)

> (b) *"the basis orthogonal sequence and the basis mask sequence being two bit punctured equivalents of a basis orthogonal sequence and a basis mask sequence corresponding to the equivalent 32 bit codeword."*

Apple says that the evidence shows that MacWilliams also discloses this limitation. (*Id.* (citing Tr. (Davis) at 2019).) As shown in the above illustration, after deletion of two bits from each of the basis sequences, from each basis orthogonal sequence and from each basis mask

sequence, there remains a two-bit punctured equivalent of a 32-bit sequence. (*Id.* (citing Tr. (Davis) at 2019).)

(3) *Claim 82*

(a) *"a controller for outputting"*

Apple says that, as previously described in Apple's discussion of claim 75, both the June 1999 Standard and MacWilliams disclose a controller for outputting. (*Id.* (citing Tr. (Davis) at 2020).)

(b) *"a 32 bit codeword from among a plurality of 32 bit codewords"*

Apple contends that both the June 1999 Standard and MacWilliams disclose outputting a 32-bit codeword from among a plurality of 32 bit codewords. (*Id.* at 54 (citing Tr. (Davis) at 2020).)

(c) *"that corresponds to a 10 bit TFCI information input to the controller from a plurality of possible 10 bit TFCI information"*

Apple says that, as previously described in Apple's discussion of claim 75, both the June 1999 Standard and MacWilliams disclose this limitation. (*Id.* (citing Tr. (Davis) at 2020-21).) Dr. Davis testified that the June 1999 Standard includes a 10-bit extended TFCI input, and MacWilliams discloses encoding a 10-bit input, that might represent TFCI information, or anything else, using 10 basis sequences. (*Id.* (citing Tr. (Davis) at 2020-21).)

(d) *"a puncturer for puncturing two bits from the 32 bit codeword output by the controller, each of the two bits being punctured at a predetermined position"*

Apple says that MacWilliams discloses a puncturer for puncturing two bits from the 32-bit codeword output by the controller, each of the two bits being punctured at a predetermined position. (*Id.* (citing Tr. (Davis) at 2021).) Apple says that Dr. Davis testified that puncturing is

taught in chapter 1 of MacWilliams, containing foundational material that is used throughout the book. (*Id.* (citing Tr. (Davis) at 2021).) A person of skill in the art at the time of the invention would make use of puncturing to modify an existing code in order to meet the constraints of a given system. (*Id.*) In this case, the ETSI working group imposed the following constraints for TFCI encoding: (1) the ability to encode up to 10 bits of information, and (2) the ability to transmit codewords at 30 bits per frame. (*Id.* (citing Tr. (Davis) at 1984).) Therefore, argues Apple, it would have been obvious to a person of skill in the art at the time of the invention that puncturing two bits at a predetermined position from a 32-bit codeword would yield a 30-bit codeword that matches these transmission constraints. (*Id.* (citing Tr. (Davis) at 2021).)

(e) *"outputting a 30 bit codeword that is equivalent to the 32 bit codeword output by the controller."*

Apple argues that MacWilliams discloses outputting a 30-bit codeword that is equivalent to the 32-bit codeword output by the controller. (*Id.* at 55 (citing Tr. (Davis) at 2021-22).) Dr. Davis testified that puncturing two bits from a 32-bit codeword yields a 30-bit codeword. (*Id.*) Because each code has a minimum distance greater than 3, the 30 bit codewords will be equivalent to 32 bit codewords. (*Id.*)

(4) *Claim 83*

(a) *"wherein each of the plurality of possible 10 bit TFCI information and each of the plurality of 32 bit codewords correspond to each other based on a combination of a basis orthogonal sequences, a basis mask sequences, and an all "1" sequence."*

Apple says that the evidence shows that MacWilliams discloses this limitation. (*Id.* (citing Tr. (Davis) at 2022).) Dr. Davis testified that the three examples of Reed-Muller basis sequences in MacWilliams include all ones sequences, basis orthogonal sequences, and basis mask sequences. (*Id.* (citing Tr. (Davis) at 2022).)

(5) *Claim 84*

(a) *"wherein a total number of the basis orthogonal sequences, the basis mask sequences and the all "1" sequence are identical to a number of bits of each TFCI information."*

Apple says that MacWilliams discloses wherein a total number of the basis orthogonal sequences and the all "1" sequence are identical to a number of bits of each TFCI information. (*Id.* (citing Tr. (Davis) at 2023).) Dr. Davis testified that this is a property of all linear codes, including Reed-Muller. (*Id.* (citing Tr. (Davis) at 2023).)

Apple contends that Dr. Min did not challenge Dr. Davis's testimony regarding the meaning of the disclosures in MacWilliams and did not challenge any aspect of Dr. Davis's application of the disclosures in MacWilliams to construct the desired apparatus and did not challenge Dr. Davis's testimony that all of that knowledge would be known to an undergraduate student. (*Id.*) Instead, according to Apple, Dr. Min argued that, because MacWilliams does not disclose the specific numerical limitations of the claimed invention verbatim, the combination of the June 1999 Standard and MacWilliams cannot invalidate. (*Id.* at 55-56 (citing Tr. (Min) at 3014).) Dr. Min's analysis ignores the law, according to Apple, because the inferences and creative steps that a person of ordinary skill would employ are included in the obviousness analysis, and the express recitation of each claim element is not required. (*Id.* (citing *KSR*, 550 US at 418).) Dr. Min's testimony that MacWilliams does not disclose encoding a 10-bit input using 32-bit codewords because the example in the textbook uses length 16 basis sequences ignores that a person of skill in the art working on TFCI encoding would have (1) understood the teaching on page 374 that the length 32 sequences can "very simply" be obtained by applying the |u|u+v| ("Plotkin") construction, also disclosed on page 374, and (2) would have known from the June 1999 ETSI meeting that the TFCI encoding scheme must accommodate a 10-bit input

and must be able to work with a 15-slot radio frame that can transmit 30 bits. (*Id.*) Likewise, with regard to puncturing, Dr. Min's only opinion is that the disclosure of puncturing in MacWilliams makes no reference to puncturing two bits from a 32-bit codeword in order to obtain a 30-bit codeword (*i.e.,* MacWilliams does not expressly recite that 32 minus 2 equals 30). (*Id.* (citing Tr. (Min) at 3007).) Apple argues that Dr. Min ignored the fact that a person of skill in the art, applying the disclosure of puncturing to the existing 32-bit codewords to fit them in a new 15-slot frame, would readily know that one way to obtain a 30-bit codeword from a 32-bit codeword was to puncture two bits. (*Id.*) Apple says that Dr. Davis explained that the application of MacWilliams to the June 1999 Standard is basic coding theory, which undergraduate students routinely perform. (*Id.* (citing Tr. (Davis) at 1962-63).) Apple says that Dr. Davis's testimony on these points was never challenged on cross-examination, and Dr. Min did not dispute Dr. Davis on this point. (*Id.*)

Apple argues that there was a clear motivation to combine the June 1999 Standard with the teachings of MacWilliams and Dr. Davis's testimony on this issue was not challenged during cross-examination. (*Id.* at 57.) According to Apple, Dr. Min offered no opinion that a person of skill in the art at the time of the alleged invention would have lacked a motivation to combine these prior art references, and Apple says that there are numerous reasons why such a person would be motivated to combine. (*Id.*)

First, argues Apple, the June 1999 Standard already utilized first-order Reed-Muller codes, which are taught in Chapters 13 and 14 of MacWilliams, to encode basic and extended TFCI information. (*Id.* (citing Tr. (Davis) at 1954-55, 1978-80).) Given that Chapter 15 of MacWilliams is devoted to second-order Reed-Muller, MacWilliams was a natural place to

search and locate additional Reed-Muller coding options for TFCI information. (*Id.* (citing Tr. (Davis) at 1968-69, 1980).)

Second, Apple says that Dr. Davis testified that MacWilliams was known at the time as the bible of error-correcting codes. (*Id.* (citing Tr. (Davis) at 1992-93).) Therefore, a person of skill in the art working on the problem at the time "would have gone to the bible of coding theory, which is MacWilliams, and because of the way TFCI had been done, namely, using Reed-Muller codes, a person of skill would have gone to the chapters on Reed-Muller codes to seek codes that would have 10-input bits and 30-output bits. (*Id.* (citing Tr. (Davis) at 1992-93).) Apple argues that Dr. Davis explained that this is exactly what he did when he was working on wireless communication systems for Hewlett-Packard in the 1990s. (*Id.*)

Third, according to Apple, not only would a person of ordinary skill in the art have been motivated to combine the June 1999 Standard with MacWilliams, but Dr. Kang, one of the named inventors on the '348 patent, testified that, in fact, he consulted MacWilliams when working on the '348 patent. (*Id.* (citing Tr. (Kang) at 197).) Moreover, argues Apple, the specification of the '348 patent refers the reader to MacWilliams for additional background on error-correcting codes. (*Id.* at 57-58 (citing JXM-1 at 7:24-26).)

b) Apple's invalidity assertions based on anticipation

(1) *MacWilliams*

Apple argues that MacWilliams alone renders the claims of the '348 patent anticipated and obvious. (*Id.* at 59.) According to Apple, a patent cannot be obtained on a new use of an old apparatus, and "in particular, (1) apparatus claims must be structurally distinguishable from the prior art, (2) the manner of operating a device does not differentiate apparatus claims from the prior art, and (3) inclusion of what is worked upon by a structure being claimed does not impart

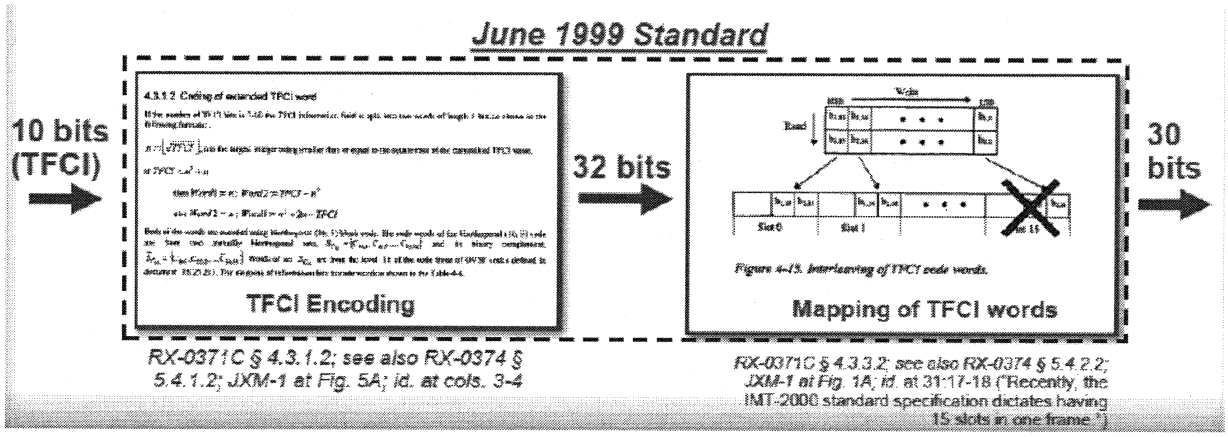
patentability to the claims." (*Id.* (citing *Hewlett-Packard Co. v. Bausch & Lamb Inc.*, 909 F.2d 1464, 1468 (Fed. Cir. 1990).) Therefore, argues Apple, the use of a known encoding apparatus to encode TFCI information is not patentable. (*Id.*) Apple notes that Dr. Davis testified that controllers and encoding apparatus are indifferent to what information the bits they are encoding represent. (*Id.* (citing Tr. (Davis) at 2025).) Dr. Davis, notes Apple, also testified that MacWilliams discloses all of the elements of the asserted claims, other than "TFCI." (*Id.*) Apple says that any of the encoders in MacWilliams could be used for encoding TFCI, and Dr. Min admitted that he had not identified any reason why the optimal minimum distance codes disclosed in Corollary 17 and Theorem 5 of MacWilliams could not be used to encode TFCI information. (*Id.* (citing Tr. (Min) at 3066-67).) Therefore, according to Apple, MacWilliams alone renders the asserted claims of the '348 patent anticipated and obvious. (*Id.*)

(2) *The June 1999 Standard*

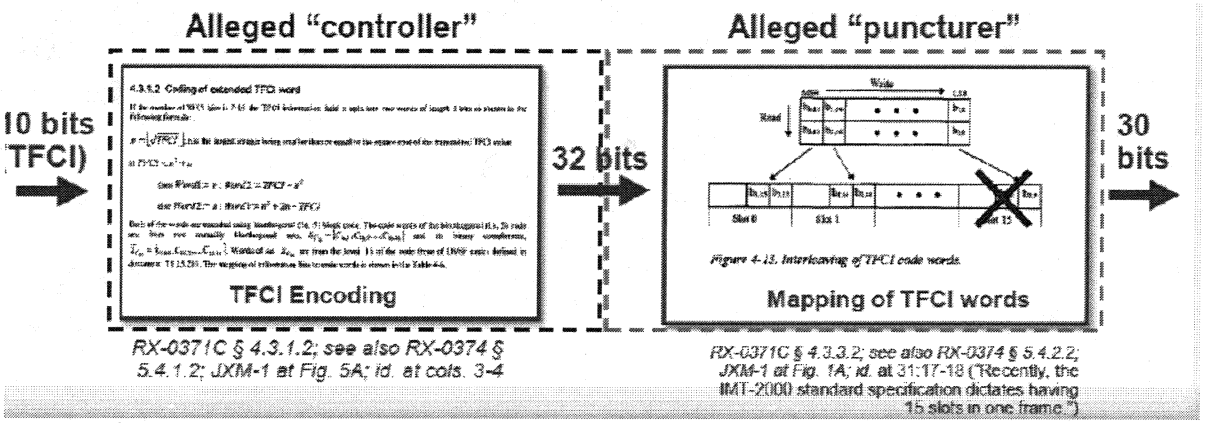
Apple notes that Dr. Min testified that compliance with UMTS[55] standards infringes both claim 75 and claim 82. (*Id.* at 59-60 (citing Tr. (Min) at 489).) To arrive at this conclusion, Dr. Min said that the "controller" for claim 82 was the means for implementing § 4.3.3 of the ETSI standard ("TFCI Encoding"), but for claim 75, the controller also included means for implementing § 4.3.5 of the ETSI standard ("Mapping of TFCI Words"). (*Id.* at 60.) This was illustrated during cross-examination of Dr. Min, through the use of RPDX-1, which contained an image of the red "box" Dr. Min drew for the "controller" in claim 75, and a black circle around the "controller" he identified for claim 82. (*Id.*) Apple argues that if Dr. Min's infringement allegations are accepted, the June 1999 Standard anticipates or renders obvious the asserted independent claims because the draft standard, as of June 1999, in light of the knowledge that the

[55] Universal Mobile Telecommunications System. (RX-374 at APL794-A000000534.)

radio frame size was going to be reduced to 15, contained all of the elements of the claims. (*Id.*) According to Apple, in the June 1999 Standard, relevant portions of which are excerpted below, the input to Dr. Min's claim 75 "controller" box is a 10-bit TFCI; the encoder in the left portion produces a 32-bit codeword, and the mapping process (accounting for the June 1999 proposal to use 15 slots per frame) transmits 30 bits from the TFCI codeword ("coded information" under the claim construction that was proposed and accepted). (*Id.*) The resulting 30-bit "TFCI codeword," under Dr. Min's analysis, would correspond to the controller, and would be equivalent to a 32-bit codeword corresponding to the same 10-bit TFCI information. (*Id.*)



(*Id.* at 61.) Likewise, argues Apple, for claim 82, the June 1999 Standard encodes a 10-bit TFCI as a 32-bit codeword (Dr. Min's claim 82 "controller") and then transmits 30 of the bits, which Dr. Min identifies as puncturing. (*Id.*)



(*Id.*) According to Apple, accepting Dr. Min's infringement analysis renders the claims invalid. (*Id.*)

(3) *Invalidity based on non-patentable subject matter*

Apple says that Samsung's arguments in support of its infringement allegations and the technical prong of its domestic industry lead to the conclusion that the '348 patent is invalid because it is directed to non-patentable subject matter that purports to cover the use of all (30, 10) sub-codes of the second-order Reed-Muller codes, which is a set of purely mathematical relationships. (*Id.*) Apple argues that claims that seek to monopolize an abstract idea or mathematical formula are not patentable. (*Id.* at 61-62 (citing *Bilski v. Kappos,* 130 S. Ct. 3218, 3231 (2010); *May Collaborative Svcs. v. Prometheus Labs, Inc.* 132 S. Ct. 1289, 1298 (2012)).) Apple argues that Samsung's only attempts to defend the validity of its asserted claims consist of arguments that a (30, 10) sub-code of a second-order Reed-Muller code was not known for encoding TFCI information. (*Id.* at 62 (citing Tr. (Min) at 3002).) Apple says Samsung cannot patent sub-codes of second-order Reed-Muller codes, because they are simply sets of mathematical relationships as described in MacWilliams. (*Id.*)

c) Samsung's Opposition to Apple's Invalidity Assertions

In opposition, Samsung says that Dr. Davis relied on only two references to support his opinion that the asserted claims of the '348 patent are invalid: (1) the June 1999 Standard, which consists of at least three documents that describe the prior standard for encoding TFCI information, and (2) MacWilliams, a mathematics textbook on coding theory, which predates CDMA systems or TFCI coding. (CBr. at 65-66).) Samsung says that when, as here, the prior art has already been considered by the United States Patent and Trademark Office (USPTO), the burden of proving invalidity is especially difficult. (*Id.* at 66 (citing *Al-Site Corp. v. VSI Int'l. Inc.*, 174 F.3d 1308, 1323 (Fed. Cir. 1999)).) The patent applicants, according to Samsung, disclosed many of the references Apple claims constitute the June 1999 Standard in the information they submitted to the USPTO. (*Id.*) Even though these references were the focus of multiple office actions, the applicants submitted a full copy of MacWilliams to the USPTO. (*Id.*)

The two references that Apple points to are cited on the face of the patent and are discussed in the background of the patent. (*Id.*) For example, MacWilliams and UMTS XX.04 Version 1.0.0 (dated February 1999), one of the documents that make up the June 1999 Standard, are cited on the face of the patent. (*Id.* (citing JXM-1 at JXM-1.3).) This section of the patent, argues Samsung, cites MacWilliams twice, once to identify the entire textbook, and a second time to specifically call out Chapter 13, the chapter Dr. Davis relies on. (*Id.*) MacWilliams and the June 1999 Standard are discussed throughout the specification of the '348 patent, and MacWilliams is referenced in the '348 patent to provide the reader with a source for background material on coding and to aid in the examiner's analysis of the patent. (*Id.* at 66-67 (citing JXM-1 at JXM-1.25; Tr. (Kang) at 197, 200).) Samsung says the June 1999 Standard is discussed in the background section of the '348 patent to provide the reader with a foundation for the

encoding scheme in place prior to the '348 patent and the motivation behind improving this previous scheme. (*Id.*) However, in the Background Of The Invention section, JXM-1 at 1:18-5:5, there is no specific mention of the June 1999 Standard, and Samsung does not adequately support this statement.

Samsung says that Dr. Davis relies on sections 5.4.1.2 and 5.4.2.2 of UMTS XX.04 v.1.0.0, cited below, to support his opinions.

5.4.1.2 Coding of extended TFCI word

If the number of TFCI bits is 7-10 the TFCI information field is split into two words of length 5 bits as shown in Figure 8.

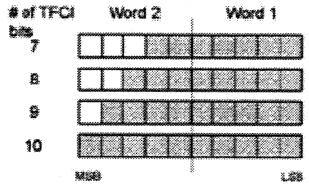


Figure 8: Mapping of TFCI bits to two words

Both of the words are encoded using biorthogonal (16, 5) block code. The code words of the biorthogonal (16, 5) code are from two mutually biorthogonal sets, $S_{C_5} = \{C_5(0), C_5(1), \ldots, C_5(15)\}$ and its binary complement, $\overline{S}_{C_5} = \{\overline{C}_5(0), \overline{C}_5(1), \ldots, \overline{C}_5(15)\}$. Words of set S_{C_5} are from the level 5 of the code three of OVSF codes defined in document XX.05. The mapping of information bits to code words is shown in Table 2.

Figure 9: Time multiplexing of code words of (32, 6) code to the slots of the radio frame

5.4.2.2 Interleaving of extended TFCI word

After channel encoding of the two 5 bit TFCI words there are two code words of length 16 bits. They are interleaved and mapped to DPCCH as shown in Figure 10.

NOTE: $b_{1,i}$ and $b_{2,i}$ denote the bit i of code word 1 and code word 2, respectively.

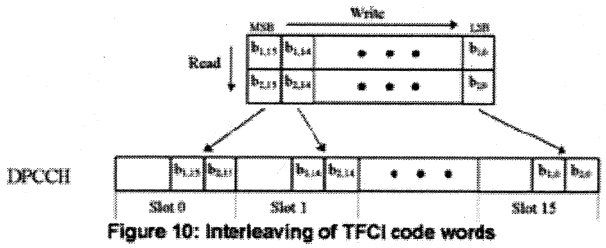


Figure 10: Interleaving of TFCI code words

RX-0374 [UMTS XX.04 v1.0.0] at 12-13; *see also* RX-0371C [TS 25.212 v 2.0.0] at 29-30

(*Id.* at 67-68.) According to Samsung, the June 1999 Standard provided an encoding scheme to encode the extended TFCI but this scheme did not provide desirable results or a solution to address the harmonization related to the transmission frame size. (*Id.* at 68 (citing Tr. (Kang) at 204).) Samsung says that those in the industry, including the '348 patent inventors, needed an improved encoding scheme to address the deficiencies of the prior system. For these reasons, Samsung argues that the June 1999 Standard teaches away from the '348 patent invention. (*Id.*)

Samsung says that the June 1999 Standard divided the 10-bit TFCI information into two separate words of five bits each, Word 1 and Word 2. (*Id.* at 69 (citing Tr. (Min) at Tr. 2990-91).) Word 1 and Word 2 were encoded using a bi-orthogonal (16, 5) block code "which each generated a first and second TFCI codeword of 16 bits." (*Id.* (citing Tr. (Min) at 2990-91).) Each of these 16-bit codewords is stored separately and is never combined into a 32-bit codeword. (*Id.* (citing Tr. (Min) at 2991).) When these two 16-bit codewords are mapped onto the 16-slot transmission frame, one bit from each of the 16-bit codewords is mapped into each slot. (*Id.* (citing Tr. (Min) at 2991).) The entire 16-bits from both codewords fit within the 16-slot transmission frame, which was the defined standard frame size at the time of the June 1999 Standard. (*Id.*) Samsung says a person of ordinary skill in the art would have understood the June 1999 Standard to be two separate encoding schemes with two separate inputs and two separate outputs. (*Id.* (citing JX-12C (Kang Dep.) at 91-92).)

This coding scheme produced undesirable results because coding 5 bits into 16 bits only provides codewords having a minimum distance of 8. (*Id.* (citing JX-12C at 203-204).) The inventors and others in the industry understood that codewords with a minimum distance of 8 would not provide sufficient error-correcting performance to prevent the TFCI information from unrecoverable corruption during transmission. (*Id.* (citing JXM-1 at 4:49-67).) The problems

with this encoding scheme were the very reason why the '348 inventors developed the coding scheme claimed in the '348 patent, argues Samsung. (*Id.*)

Samsung argues that the June 1999 Standard does not anticipate claim 82 and says that Apple failed to demonstrate that that standard discloses all of the limitations of claim 82. (*Id.* at 70.) Instead, argues Samsung, the record evidence confirms that the June 1999 Standard lacked these limitations. (*Id.*)

With respect to the limitation that reads "32 bit codeword that corresponds to a 10-bit TFCI information input," Samsung says the June 1999 Standard does not teach this element. (*Id.* (citing Tr. (Min) at 2992-93).) Samsung says that each 5-bit input is coded using a (16, 5) encoder to result in two 16-bit codewords. (*Id.*) These two codewords are never combined into a 32-bit codeword, says Samsung. (*Id.*) The (16, 5) encoder ensures that the 5-bit input corresponds to a 16-bit codeword. (*Id.*) Since a 32-bit codeword is never generated, the extended TFCI never corresponds to a 32-bit codeword. (*Id.*)

Samsung says that the June 1999 Standard does not teach "a puncturer for puncturing two bits from the 32 bit codeword output by the controller, each of the two bits being punctured at a predetermined position" as set forth in claim 82. (*Id.* (citing Tr. (Min) at 2993-94).) The June 1999 Standard dictated 16 slots, and since these slots can hold an entire 32-bit codeword (*i.e.,* 16 slots multiplied by 2 TFCI code-word bits equals 32 bits), there was no need to puncture two bits to fit the transmission frame. (*Id.*)

Samsung says puncturing two bits was not inherent, because the June 1999 Standard did not require reducing bits, and a person of ordinary skill in the art would understand that it is always better to send more, rather than less, information in order to aid in error correcting. (*Id.* at 70-71.) Also, according to Samsung, even if there was a need to reduce the number of

transmitted bits, there are many ways to reduce the length of a codeword. (*Id.* (citing Tr. (Min) at 2994).) Samsung says the June 1999 Standard never creates a 30-bit codeword, as Samsung previously discussed, and because the two 16-bit codewords fit within the 16 slots of the transmission frame, there was no need to reduce the codeword length by two bits. (*Id.*) Therefore, the June 1999 Standard fails to teach this limitation. (*Id.*)

Samsung argues that, for the same reasons, the June 1999 Standard does not anticipate claim 75. (*Id.* (citing Tr. (Min) at 2999).) The June 1999 Standard does not teach "a controller for outputting a 30-bit codeword from among a plurality of 30-bit codewords that correspond to a 10-bit TFCI information input. (*Id.*) The June 1999 Standard does not create a 30-bit codeword, because the two 16-bit codewords it prescribes fit entirely within the 16 slots of the transmission. (*Id.*) Therefore, there is no 30-bit codeword to correspond to a 10-bit TFCI information input, argues Samsung. (*Id.*) Similarly, the June 1999 Standard does not teach "the 30 bit codeword output by the controller is equivalent to a 32 bit codeword that corresponds to the 10 bit TFCI information input." (*Id.*) The June 1999 Standard never creates a 32-bit codeword or a 30-bit codeword, and therefore the June 1999 Standard cannot teach a 30-bit codeword that is equivalent to a 32-bit codeword that corresponds to the 10-bit TFCI information input, says Samsung. (*Id.* at 71-72.)

As for MacWilliams, it does not explicitly or inherently disclose any of the limitations set forth in claims 75-76 and 82-85, argues Samsung. (*Id.* at 72.) According to Samsung, MacWilliams sets forth basic concepts for error-correcting codes, such as bi-orthogonal codes, Hamming codes, and Reed-Muller codes, which are tools the '348 inventors used to develop their novel encoding scheme. (*Id.*) While it is important to understand the basic concepts of error-correcting codes in order to build a particular code that can be used in a real-world

operation, these basic concepts do not provide sufficient information to enable a person of ordinary skill in the art to invent the teachings in the asserted claims. (*Id.* (citing Tr. (Min) at 3001-02).) The inventors did not find a solution in MacWilliams but, rather, took the basic concepts identified in MacWilliams, as well as other textbooks, and combined this information with their own research, analysis, and testing to form a novel error-correcting code that achieved the objectives for coding TFCI. (*Id.* (citing JX-12C at 118-119, 122).)

Samsung argues that Dr. Davis admits that MacWilliams predates CDMA systems and TFCI and, therefore, does not, and cannot disclose those claims. (*Id.* (citing Tr. (Davis) at 64).) Samsung argues that Dr. Davis's opinion is an oversimplification and fails to account for real-world considerations. (*Id.* (citing Tr. (Min) at 3001-02).) For example, MacWilliams does not provide its readers with the desired performance requirements for coding TFCI information or provide a discussion on the TFCI encoding environment. (*Id.*) Without an understanding of these constraints, a person of ordinary skill would not be able to determine that coding TFCI requires codewords with certain minimum distance or the knowledge of the TFCI encoding environment as not to disrupt the entire currently existing infrastructure. (*Id.* at 72-73 (citing Tr. (Min) at 3001-02).) Samsung says the asserted claims are directly related to coding TFCI information, and without this disclosure, MacWilliams falls short of anticipating the '348 patent claims. (*Id.* at 73.)

Samsung says that MacWilliams does not disclose TFCI information, and, therefore, cannot anticipate claims 82-84. (*Id.* (citing Tr. (Min) at 3003-04).) As admitted by Dr. Davis, MacWilliams does not disclose TFCI or CDMA, according to Samsung. (*Id.* (citing Tr. (Davis) at 64).) The '348 patent applicants clearly set forth in their claims that the information to encode is "TFCI information." (*Id.*) Samsung argues that the words of a patent claim are given their

ordinary and customary meaning, as understood by a person of ordinary skill in the art, when read in the context of the specification and prosecution history. (*Id.* (citing *Phillips v. AWH Corp.*, 415 F.3d 1303, 1212-13 (Fed. Cir. 2005)).) The only two exceptions to this rule, argues Samsung, are (1) when a patentee sets out a definition and acts as his own lexicographer, or (2) when the patentee disavows the full scope of a claim term either in the specification or during prosecution. (*Id.* (citing *Vitronics Corp. v. Conceptronic Inv.*, 90 F.3de 1576, 1582-83 (Fed. Cir. 1996)).) Samsung says the applicants never disavowed the term "TFCI information" during prosecution of the patent or in the specification. (*Id.*) According to Samsung, "TFCI information" must be given its plain and ordinary meaning, and reading out "TFCI" from "TFCI information would be improper. (*Id.*) Samsung says that "TFCI information" would not be an inherent disclosure of MacWilliams, because TFCI did not exist at the time this textbook was published. (*Id.*) Therefore, "TFCI information" cannot be a necessary feature of this textbook. (*Id.*)

> (1) *"outputting a 32-bit codeword...that corresponds to a 10 bit TFCI information input" (claim 82); "each of the plurality of possible 10 bit TFCI information and each of the plurality of 32 codewords correspond to each other" (claim 83)*

Samsung says that MacWilliams does not disclose "outputting a 32 bit codeword…that corresponds to a 10 bit TFCI information input," as required by claim 82, or "each of the plurality of possible 10 bit TFCI information and each of the plurality of 32 codewords correspond to each other," as required by claim 83. (*Id.* at 74 (citing Tr. (Min) at 3004-05).) MacWilliams does not disclose an encoding scheme that takes a 10-bit input and encodes the input into a 30- or 32-bit output, according to Samsung. (*Id.*) Dr. Davis, argues Samsung, relies on Figure 13.2 to support his opinion that this limitation is met. (*Id.* (citing Tr. (Davis) at 1949).) This encoding table, says Samsung, sets forth 16 sequences for a 16-bit Reed-Muller code and

demonstrates how to encode a 32-bit codeword corresponding to a 10-bit TFCI information input. (*Id.* (citing RX-367 at 374).) The greatest number of output bits this table can produce is 16 bits, not 32 bits, according to Samsung. (*Id.*) Therefore, argues Samsung, Dr. Davis has failed to identify that MacWilliams anticipates these claim limitations. (*Id.*)

> (2) *"a puncturer for puncturing two bits from the 32 bit codeword output by the controller, each of the two bits being punctured at a predetermined position" (claim 82)*

MacWilliams does not disclose "a puncturer for puncturing two bits from the 32-bit codeword output by the controller, each of the two bits being punctured at a predetermined position" from claim 82, Samsung contends. (*Id.* (citing Tr. (Min) at 3006-07).) According to Samsung, MacWilliams does not disclose puncturing two bits from a 32-bit codeword. (*Id.*) Samsung says that Dr. Davis uses Figure 13.2 from Chapter 13 and combines that disclosure with pages 28 and 29 from Chapter 1 of MacWilliams to support his opinion that this claim limitation is taught in MacWilliams. (*Id.* (citing RX-367 at 28-29, 374).) Samsung says that Chapter 1 provides a general description of puncturing and shows that if there is a need to eliminate one coordinate from a three-bit codeword, that can be done by eliminating one column of the coding table to provide at table that produces two-bit codewords. (*Id.* at 75 (citing Tr. (Min) at 3006).) Samsung maintains that Figure 13.2 does not disclose a 32-bit codeword or disclose a code that outputs 32-bit codewords. (*Id.*) Combining the teachings in MacWilliams at Chapter 13, Figure 13.2, with the general discussion of puncturing in Chapter 1 does not disclose the claimed limitation. (*Id.*)

> (3) *"outputting a 30 bit codeword that is equivalent to the 32 bit codeword output by the controller" (claim 82)*

Samsung says that MacWilliams does not disclose "outputting a 30 bit codeword that is equivalent to the 32 bit codeword output by the controller," as required by claim 82. (*Id.* (citing