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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN JOSE DIVISION

APPLE INC., a California corporation,

Plaintiff,

v.

SAMSUNG ELECTRONICS CO., LTD., A
Korean business entity; SAMSUNG
ELECTRONICS AMERICA, INC., a New York
corporation; SAMSUNG
TELECOMMUNICATIONS AMERICA, LLC, a
Delaware limited liability company,

Defendants.

Case No. 11-cv-01846-LHK

**REPLY DECLARATION OF
RAVIN BALAKRISHNAN, PH.D.
IN SUPPORT OF APPLE'S
MOTION FOR A PRELIMINARY
INJUNCTION**

1 I, RAVIN BALAKRISHNAN, do hereby declare as follows:

2 **I. INTRODUCTION**

3 1. I am a tenured Professor in the Department of Computer Science at the University
4 of Toronto, and have been asked to provide a reply expert declaration on behalf of Apple Inc.
5 (“Apple”) in the above-captioned case. I understand that Apple has alleged that Defendants
6 Samsung Electronics Co. Ltd., Samsung Electronics America, Inc., and Samsung
7 Telecommunications America, LLC (collectively, “Samsung”) have engaged in patent
8 infringement. I also understand that Samsung has alleged that Apple’s patent is invalid and not
9 infringed.

10 2. I submit this reply declaration in response to the declarations of Drs. Andries van
11 Dam, Benjamin B. Bederson, and Jeffrey Johnson. I reserve the right to supplement or amend
12 this declaration if additional data or other information that affects my opinions becomes available.
13 I may testify at a hearing regarding the matters expressed in this declaration and any supplemental
14 declarations that I may prepare for this litigation. I also may prepare and rely on audiovisual aids
15 to demonstrate various aspects of my testimony at a hearing. I also may testify with respect to
16 any matters addressed by any expert testifying on behalf of Samsung, if asked to do so. If I am
17 asked to testify at trial, I intend to prepare an expert report in compliance with Federal Rule of
18 Civil Procedure 26(a)(2) according to the schedule to be set by the Court.

19 3. I am being compensated at my standard consulting rate of \$430 per hour for my
20 work in connection with this action. My compensation is not based in any way on the outcome of
21 the litigation.

22 **II. QUALIFICATIONS**

23 4. A current, true, and correct copy of my curriculum vitae was attached to my
24 opening declaration in support of Apple’s Motion for a Preliminary Injunction (“Opening
25 Declaration”) as Exhibit 1. Rather than repeat the detailed description of my qualifications
26 outlined in my Opening Declaration, I incorporate that description by reference.

1 **III. MATERIALS CONSIDERED**

2 5. In forming my opinions and views expressed in this reply declaration, I reviewed
3 (1) the materials listed in paragraphs 14-16 of my Opening Declaration, (2) the non-confidential
4 declarations, with non-confidential exhibits, of Andries Van Dam, Benjamin Bederson, and
5 Jeffrey Johnson in support of Samsung's Opposition to Apple's Motion for a Preliminary
6 Injunction, and (3) the non-confidential deposition transcripts, with non-confidential exhibits, of
7 Andries Van Dam, Benjamin Bederson, Jeffrey Johnson, and Bas Ording.

8 6. I have also reviewed the materials submitted by Dr. Bederson related to the
9 LaunchTile and XNav software, WO 03/081458 and U.S. Patent No. 7,872,640 to Lira ("Lira"),
10 International Publication Number WO 01/29702 and U.S. Patent No. 7,152,210 to Van Den
11 Hoven ("Van Den Hoven"), and U.S. 2008/0104544 A1 ("Collins"). Finally, I have reviewed and
12 considered U.S. Patent No. 7,965,263 and U.S. 2007-0080907. Attached hereto as Exhibits A-C
13 are videos demonstrating certain features of the LaunchTile software. True and correct copies of
14 WO 03/081458, WO 01/29702, US 2008/0104544 A1, U.S. Patent No. 7,965,263, and U.S. 2007-
15 0080907 are attached hereto as Exhibits D-H. True and correct copies of excerpts from the
16 Bederson and Van Dam depositions are attached hereto as Exhibits I & J. True and correct copies
17 of Bederson Deposition Exhibits 211, 212, 213 & 222 are attached hereto as Exhibits K-N.
18 Lastly, a true and correct copy of Bederson Declaration Exhibit A is attached hereto as Exhibit O.

19 **IV. LEGAL PRINCIPLES**

20 7. I have not been asked to offer an opinion on the law; however, as an expert
21 assisting the Court in determining infringement, I understand that I am obliged to follow existing
22 law. I have therefore been asked to apply the legal principles outlined in paragraphs 18-20 of my
23 Opening Declaration to my analysis of infringement. Those paragraphs are incorporated herein
24 by reference.

25 8. I have also been asked to apply the following legal principles to my analysis of
26 patent validity under § 102 (anticipation) and § 103 (obviousness). For a claim to be anticipated,
27 every element and limitation of the claimed invention must be found in a single prior art
28 reference, arranged as in the claim. *Lindemann Maschinenfabrik GMBH v. American Hoist &*

1 *Derrick Co.*, 730 F.2d 1452, 1459 (Fed. Cir. 1984). Inherent anticipation requires that the
2 missing descriptive material is “necessarily present,” not merely probably or possibly present, in
3 the prior art.

4 9. A claim is invalid for obviousness if “differences between the subject matter
5 sought to be patented and the prior art are such that the subject matter as a whole would have
6 been obvious at the time the invention was made to a person having ordinary skill in the art to
7 which said subject matter pertains.” 35 U.S.C. § 103(a). The mere existence of each and every
8 element of the claimed invention in the prior art does not necessarily prove obviousness, since
9 inventions typically rely on building blocks of prior art. In considering whether a claimed
10 invention is obvious, one may consider whether there was a reason that would have prompted a
11 person having ordinary skill in the field of the invention to combine known elements in a way the
12 claimed invention does, taking into account such factors as: (1) whether the claimed invention
13 was merely the predictable result of combining familiar prior art elements according to their
14 known function(s); (2) whether the prior art teaches or suggests the desirability of combining
15 elements claimed in the invention; (3) whether the prior art teaches away from combining
16 elements in the claimed invention; and (4) whether a person of skill in the art had used a known
17 technique to improve similar devices in the same way. It is not sufficient to show that it was
18 obvious to try a combination. Copying by others is one secondary consideration of non-
19 obviousness.

20 **V. DETAILED OPINION**

21 **A. Introduction**

22 10. As stated in my opening declaration, the ’381 patent provides an elegant solution
23 to a vexing user interface problem. To my knowledge, until the Apple iPhone was launched,
24 touch screen devices did not have a visually intuitive way to alert a user when he or she had
25 reached the edge of the document when scrolling or panning it. Now, this feature is nearly
26 ubiquitous, including in Samsung’s own devices.

27 11. Samsung’s alleged prior art does not disclose the edge-responsive functions of the
28 ’381 patent. Its cited references at best disclose automatic re-centering features when scrolling or

1 panning *within* the document, which have a different purpose than the '381 patent. Because these
2 references are not concerned with what should happen when the edge of the document is reached,
3 they still embody the main problem that the '381 patent solved. Users either are not allowed to
4 scroll past the edge (*i.e.* they hit a “hard stop”) or are allowed to scroll endlessly into empty areas
5 devoid of any content.

6 12. In an attempt to dismiss these key differences, Samsung arbitrarily treats the lines
7 *within* the boundaries of a document in the same manner as external “edges.” It also sets up a
8 demonstration to simulate supposed edge-responsive behavior with software that in fact is merely
9 re-centering items. While that may be easy to do with the '381 patent already in hand, a person of
10 skill in the art at the time of the invention would not have recognized the edge-responsive
11 advantages of the '381 patent in Samsung’s prior art.

12 13. My declaration begins by showing that Samsung’s alleged prior art was trying to
13 solve a different problem than the '381 patent, and that it still suffers from the principal
14 limitations and constraints that the '381 patent was designed to solve. Next, I discuss the faults
15 and shortcomings in Dr. Van Dam’s invalidity and inequitable conduct opinions, concluding that
16 the references he cites do not disclose key elements of the asserted claims or render them obvious.
17 Finally, I address Dr. Johnson’s infringement analysis, which is based on strained claim
18 interpretations that defy common sense.

19 **B. Invalidity and Inequitable Conduct**

20 **1. Summary of Opinion**

21 14. The '381 patent provides an elegant and visually intuitive solution to a discrete
22 issue: what to do when a user scrolls to the edge of an electronic document. In the prior art, when
23 a user scrolled to the edge of a document, one of two scenarios would play out. Either she would
24 scroll continuously past the edge of the document into nothingness (*i.e.* beyond a place where
25 there was any meaningful content), or she would hit a “hard stop” and not be allowed to scroll
26 any further.

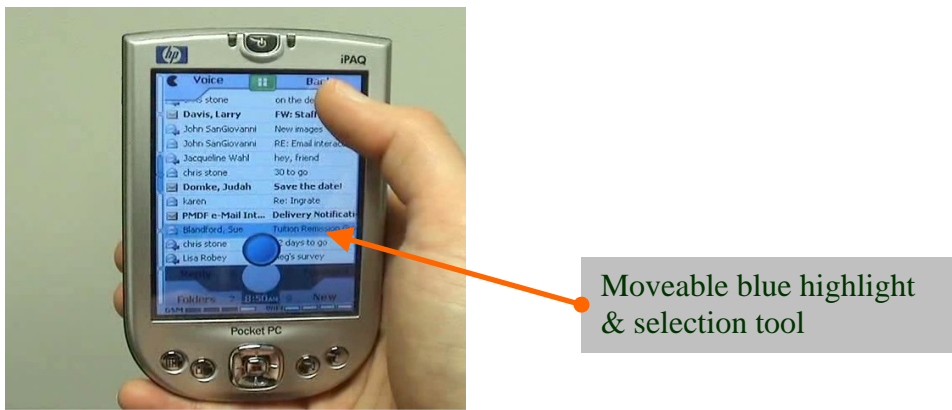
27 15. Each of these scenarios has its own disadvantages. Allowing a user to move
28 through virtual space going absolutely anywhere, including beyond a place that has any

1 meaningful content, can cause the user to become disoriented. (*See* Ex. N (Desert Fog Article) at
2 p. 4; Ex. I, Bederson Dep. at 204:6-24; 205:6-207:5; 213:2-214:1.) In a paper he wrote in 2011,
3 Dr. Bederson referred to this as the “Desert Fog” citing an earlier article written by Jul and
4 Furnas. (*Id.*; *see also*, Ex. J, Van Dam Dep. at 63:3-17 (referring to the empty area as “no man’s
5 land”).) Users who navigate into these empty spaces may get lost and not know how to find their
6 way back. (*Id.*; *see also*, Van Dam Dec. (D.I. 168) at ¶ 144.)

7 16. Most user interfaces avoided the “Desert Fog” problem by inserting a hard stop at
8 the edge of a document. But that solution has its own disadvantages. If the user does not realize
9 he has hit the edge of a document, he may keep trying to move the document in vain. No matter
10 how hard he tries, however, the device will not allow the document to move. As a result, the user
11 may think his device has frozen or locked up, or that it is otherwise not registering his input. In
12 any case, the user could become frustrated when the scrolling or translating does not reflect his
13 intent. (’381 Patent at 2:26-28; *see also*, Van Dam Dec. (D.I. 168) at ¶ 144 (one way to prevent a
14 user from moving an electronic document beyond the edge is “to prevent the document from
15 moving beyond the edge by ignoring further requests for any such movement”).)

16 17. The inventors of the ’381 patent recognized these disadvantages and created a
17 novel solution to overcome them. When the user attempts to scroll past the edge of the document,
18 an area beyond the edge is displayed. (’381 patent at 26:59-63 & Fig. 5.) This area provides the
19 user with an instant visual cue informing him that the edge of the document has been reached.
20 (*Id.*) Importantly, in an exemplary embodiment shown in Figures 8A-D, this area beyond the
21 edge is displayed adjacent to a portion of the electronic document, enabling the user to maintain
22 context and avoid the “Desert Fog” problem. Once the user lifts his finger (or other object) from
23 the surface of the screen, the document moves or snaps back into place, and the area beyond the
24 edge disappears. (*See, e.g.*, ’381 patent at Claim 1.) The elegant solution proposed by the ’381
25 patent significantly enhances the user’s experience in viewing photos, web pages, lists, and other
26 electronic documents. To my knowledge, touch screen devices in the prior art did not have a
27 visually intuitive way to alert a user when he or she had reached the edge of the document when
28 scrolling or panning.

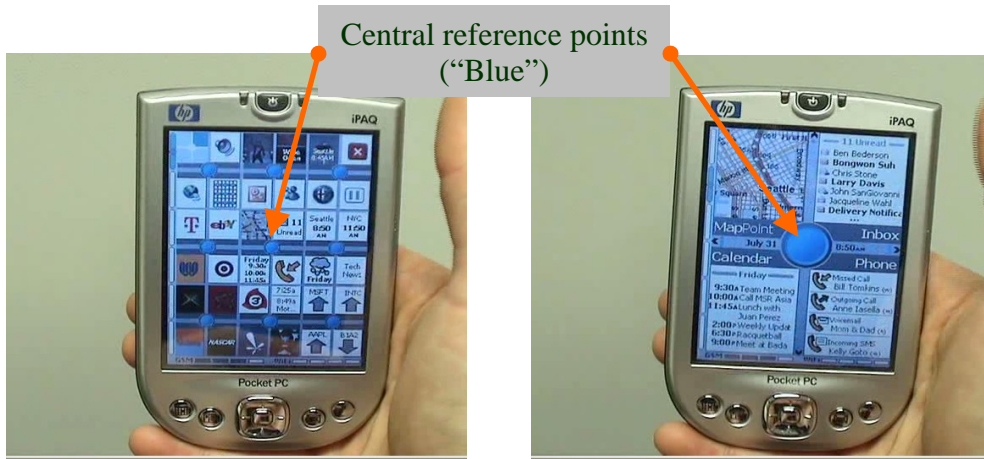
1 18. The prior art cited by Samsung is not concerned with problems that occur when
2 reaching, crossing or falling off the “edge” of the document. Rather, these references at best
3 disclose auto-centering functions not designed to be responsive to the edge of the document. In
4 LaunchTile and XNav, when the user interacts with the device, the content of the screen is
5 automatically re-centered to a pre-defined reference point called “Blue.” (Ex. O (“LaunchTile
6 Article”) at p. 204.) In the e-mail application view (shown below), “Blue” is a translucent blue
7 “highlight” bar, which doubles as an e-mail selection tool. The user can move this bar up and
8 down to select e-mails. (Ex. O, LaunchTile Article at p. 205 (“In cases where limited display real
9 estate necessitates smaller targets, the central Blue widget serves as a moveable tool glass which
10 can be positioned over the target object. . . .”)) If the highlight bar does not line up with an e-
11 mail, the bar and list are automatically re-aligned, thus allowing the user to more easily select a
12 desired e-mail.



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19 **Fig. 1 - Screenshot from Bederson Dec. Ex. L (D.I. 165-12) showing e-mail application view**

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21 19. In the 6X6 “World” and 2X2 “Zone” views (shown below), Blue is depicted as a
22 blue dot or dots on the screen. (*Id.*; Ex. I, Bederson Dep. at 189:13-190:3.) If the user scrolls a
23 sufficient distance towards an adjacent zone, the user interface automatically navigates to that
24 zone, re-centering the page on the Blue dot. This re-centering feature ensures that the user is
25 never caught in between two zones. (*See, e.g.*, Ex. O, LaunchTile Article at p. 205; Ex. I,
26 Bederson Dep. at 190:21-192:10.)

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Figs. 2 & 3 - Screenshots from Bederson Dec. Ex. L (D.I. 165-12) showing “World” and “Zone” view

20. The inventors of Lira similarly recognized that as a user navigates around a large webpage on a device with a small-screen, “such ‘touch-and-drag’ scrolling can result in information 610 that is positioned in the display window 605 but is difficult to view or read since the user may inadvertently navigate to a position where only a portion of a column or an image is visible in the PDA display window 605.” (Ex. D, Lira at p. 11, l. 27 - p. 12, l. 2; *see also*, p. 12, l. 30 - p. 13, l. 2.) They therefore devised methods for reconfiguring the webpage into columns so that the page could be more easily viewed on a small screen. (*See, e.g., id.* at p. 13, ll. 14-17; p. 14, l. 29 - p. 15, l. 5; p. 15, ll. 18 - 21.) For convenience, the PDA display would be re-centered to a column, so that the column aligned perfectly with the display. This re-centering method is illustrated in Figure 14B, shown below.

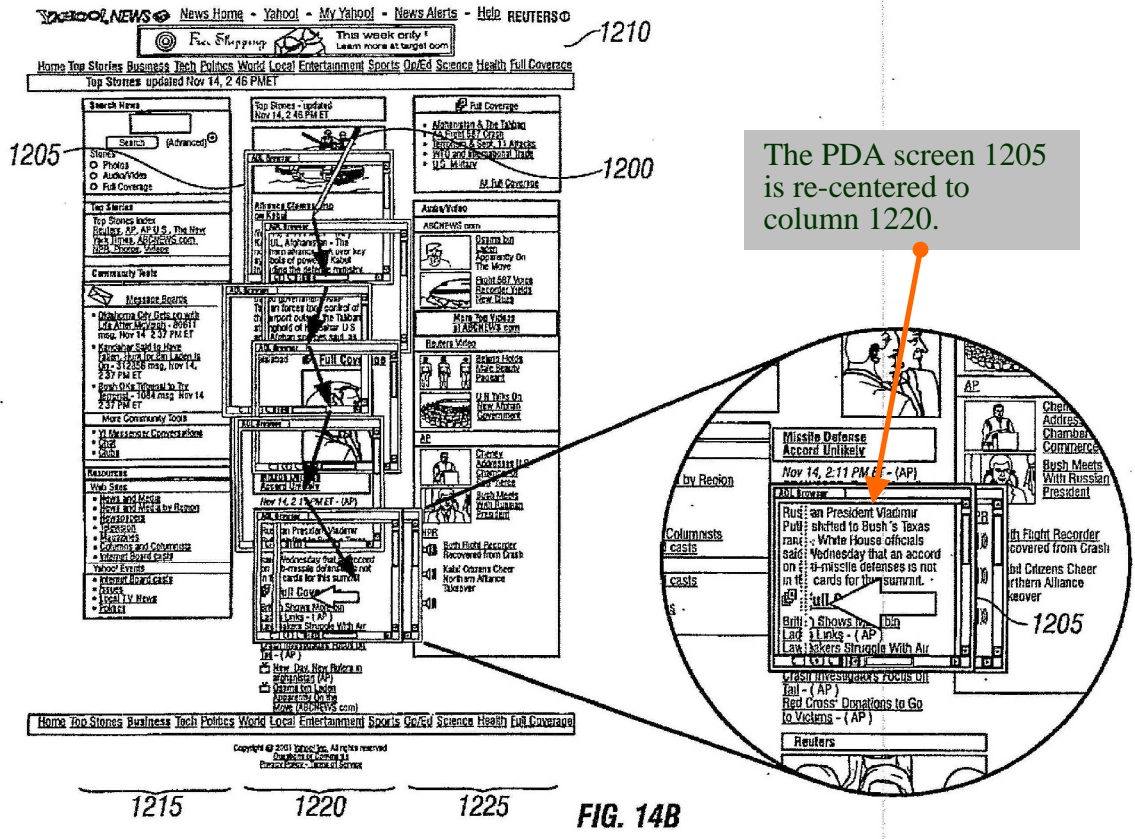
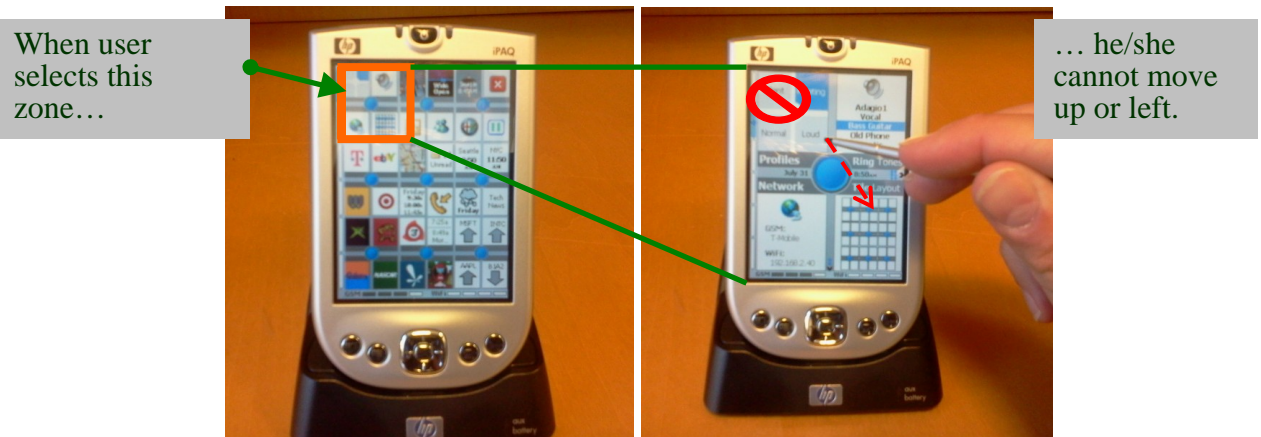


Fig. 4 - Lira Figure 14B

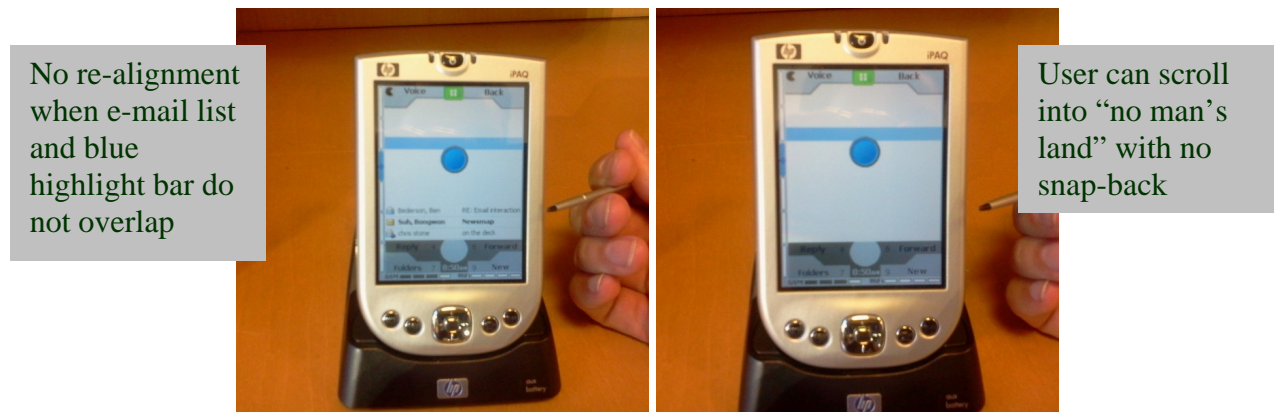
21. Finally, Van Den Hoven merely discloses a user interface that scrolls through a sequence of thumbnail images automatically. (Ex. E, Van Den Hoven at p.2, ll. 21-22 & Fig. 2.) The sequence of images is designed to look like a roll of film to make the display more recognizable to the user. (Ex. E, Van Den Hoven at p. 5, ll. 17-21 & Fig. 2.) The user can speed up or slow down the automatic scrolling by swiping his finger on the screen. (Ex. E, Van Den Hoven at p. 6, ll. 28-31.) When the last image in the sequence is reached, the sequence can either loop back to the beginning, or it hits a hard boundary and reverses direction. (Ex. E, Van Den Hoven at 6, 1-4.)

22. Significantly, these references embody the very same disadvantages that the '381 patent is designed to solve. In LaunchTile, individuals are not allowed to scroll past the borders of the "World." Attempting to do so will result in a hard stop. (See Ex. A, Video No. 1; Ex. I, Bederson Dep. at 148:25-149:4.) Conversely, the LaunchTile e-mail application is unbounded,

1 allowing users to scroll into the empty white area past all e-mails (into the “Desert Fog” or “no
 2 man’s land”). If the user lifts his finger while navigating in this space, the e-mail application does
 3 not snap back to the e-mail list. (See Ex. B, Video No. 2; Ex. I, Bederson Dep. at 113:2-13.) In
 4 Van Den Hoven, the scrolling happens automatically and hits a hard boundary when the last
 5 image is reached. (Ex. E, Van Den Hoven at p. 6, 1-4.) There is no discussion about displaying
 6 an area beyond the edge of the document or moving the document back into place. Finally, Lira
 7 is concerned with what happens while navigating within a webpage. It does not disclose what
 8 will or should happen if and when the user tries to scroll past the edge of the page.



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16 **Fig. 5 - Screenshots from LaunchTile “World” and “Zone” views**



23 **Fig. 6 - Screenshots from LaunchTile E-mail view**

24 23. The behavior in Samsung’s prior art occurs in response to misalignment, *i.e.* when
 25 content needs to be re-centered to a point within the display window. The actions in the ’381
 26 patent occur in response to the edge of the document being reached. As a result, the prior art does
 27 not disclose at least two critical edge-responsive features of the asserted claims: (1) displaying an
 28 area beyond the edge of the document, and (2) moving the portion of the document back into

1 view when the user's finger (or other object) is no longer detected on the display. To one of skill
2 in the art, the re-centering solutions in Samsung's prior art are very different from the edge-
3 specific functions described and claimed by the '381 patent. Dr. Van Dam's discussion of
4 physics based metaphors fails to address this distinction.

5 **2. LaunchTile / XNav¹**

6 24. The LaunchTile / XNav art actually consists of four separate references: (1) the
7 XNav source code; (2) the LaunchTile publications (articles and PowerPoint slides); (3) Dr.
8 Bederson's LaunchTile videos; and (4) public demonstrations at trade shows.² Dr. Bederson
9 cannot recall what features were publicly demonstrated before the priority date, so there is no
10 evidence that the demonstration disclosed any of the allegedly anticipating features. (Ex. I,
11 Bederson Dep. at 158:21-159:2; 160:18-23.) Having now had the opportunity to review the
12 remaining references, in my opinion these references fail to disclose all of the elements of the
13 asserted claims or render them obvious.

14 **a. The XNav Source Code Demonstrates that XNav and**
15 **LaunchTile Are Performing an Internal Re-Centering**
16 **Procedure.**

17 25. I have reviewed a copy of the XNav source code, which is attached as Exhibit G to
18 Dr. Bederson's Declaration. The XNav source code confirms that LaunchTile and XNav do not
19 disclose the edge-specific functions of the '381 patent but are instead performing an internal re-
20 centering procedure. In the case of the XNav e-mail application, that re-centering function is
21 called "SnapObjectToHighlight." (See Ex. L ("E-mail source code") at pp. 29-30;³ Ex. I,

22 ¹ According to Dr. Bederson, the allegedly anticipating features of LaunchTile and XNav
23 are identical. (Ex. I, Bederson Dep. at 103:4-20.) Accordingly, for the purposes of this report, I
will also treat LaunchTile and XNav interchangeably.

24 ² I understand that there also are serious questions about whether the source code qualifies
25 as prior art. The XNav source code was not distributed publicly, but instead was sent via an
26 encrypted message to Microsoft. (Ex. I, Bederson Dep. at 172:6-174:12; *see also*, 181:5-183:3.)
27 Because the code was kept private, a person of skill in the art would not have access to it.
Moreover, Dr. Bederson does not "have a precise time stamp of that source code that correlates
with the video that shows that it was done exactly the same day and that it was exactly the same
code." (Ex. I, Bederson Dep. at 98:18-23; *see also, id.* at 97:6-98:17.)

28 ³ True and correct copies of the XNav source code, which were marked as Bederson
Deposition Exhibits 211, 212 and 213, are attached hereto as Exhibits K-M.

1 Bederson Dep. at 56:14-58:2; 64:16-21.) The code simply determines which e-mail header is
2 overlapping with the blue highlight bar the most, calculates the distance between these items, then
3 realigns the two. (*Id.*; *see also*, Ex. I, Bederson Dep. at 80:2-82:2.)⁴ As Dr. Bederson admits, the
4 exact same code causes the e-mail header to realign to the highlight bar regardless of whether it is
5 positioned in between e-mails or after the last e-mail. (*See* Ex. I, Bederson Dep. at 78:17-79:8.)
6 In my opinion, a person of skill in the art reviewing this code would not see any edge-responsive
7 functions. Rather, the purpose of this code is to ensure that the e-mail header stays aligned to the
8 movable blue bar, which also acts as an e-mail selection tool. (*See* Ex. C, Video No. 3; *see also*,
9 Ex. J, Van Dam Dep. at 60:5-63:17 (noting that there is no snap back when the e-mail headers
10 and highlight bar do not overlap); 157:15-161:24 (admitting that he did not review the source
11 code, and that a benefit of the functionality is to center the header row with the highlight).) This
12 helps the user more easily select desired e-mails.

13 26. As demonstrated in Figure 6 above, the LaunchTile e-mail program has no
14 reaction to scrolling past the terminus of the list of email headers. Indeed, it allows the user to
15 continue scrolling well past the terminus of the e-mail list. The software does not realign the list
16 because there is no overlap between the e-mail header and the blue highlight bar. (*See* Figure 6
17 above; Ex. B; Ex. L, E-mail Source Code at pp. 29-30; Ex. I, Bederson Dep. at 84:20-86:21.) In
18 short, all of the “snapping” features in the e-mail application are tied to the position of this
19 highlight bar and do not occur in response to the edge of the document being reached.

20 27. The zoomed-in “Zone” view discloses a similar method for auto-centering. (*See*
21 Ex. M, Bederson Dep. Ex. 213 (XNav Source Code) at pp. 19-20; Ex. I, Bederson Dep. at 115:10-
22 117:11; 124:17-126:8; 133:15-135:16; 189:13-190:3; Ex. J, Van Dam Dep. at 154:12-155:25.)
23 Specifically, if the user lifts his finger after moving more than a sixth of the way towards an
24 adjacent zone, the program will continue scrolling to that zone. (*Id.*) This auto-centering feature
25 works only when scrolling within the perimeter, or inside the “edges” of the “World,” since as

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27 ⁴ This code relies on a second function called “GetIntersectingEmailItemBounds” which
28 determines the bounds of an e-mail header that most overlaps with the blue highlight bar. (Ex. I,
Bederson Dep. at 29:4-6; 30:1-14; 56:14-25; Ex. K, Bederson Dep. Ex. 211 (Source Code) at 3.)

1 shown in Figure 5 above it is impossible to scroll beyond the “edges” of these tiles. (*See also*,
2 Ex. I, Bederson Dep. at 144:20-145:7; 146:5-14.) As a result, the software cannot display an area
3 beyond the edge of the tiles, and the array of tiles cannot move back in the opposite direction after
4 the user lifts his finger. XNav thus fails to disclose the main user-friendly features of the ’381
5 patent.

6 28. Dr. Van Dam attempts to avoid these flaws by treating the internal gridlines within
7 the “World” and “Zone” views as “edges.” These internal lines cannot be treated as “edges,”
8 however, because there is still content outside of these boundaries that the user can scroll to. (*See*
9 *also*, Ex. I, Bederson Dep. at 205:18-206:11 (stating that most document browsers limit
10 navigation to the available content).)⁵ If I draw a line through a piece of paper (the physical
11 counterpart for the electronic document), the edges of that page remain the same. Similarly, the
12 internal grid lines within the “World” or “Zone” of LaunchTile are not the same as the external
13 boundaries that define the “edge” of the electronic document. With the ’381 patent in front of
14 you, it is easy to draw arbitrary lines within a document and refer to those lines as edges. But in
15 my opinion, a person of skill in the art at the time of the invention would not have understood the
16 edge-specific advantages of the ’381 patent while navigating at the center of the “World.”
17 Rather, the software at best teaches re-aligning screen objects to a central “Blue” UI element.

18 29. In sum, the key relationship in XNav is between the objects on the screen and the
19 “Blue” element. The source code does not teach the main advantage of the ’381 patent which
20 involves performing the edge-responsive functions of the claims. As a result, I do not believe that
21 the XNav code discloses all the limitations of the asserted claims or render them obvious.

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25 ⁵ I was asked to evaluate the LaunchTile program in the context of the ’381 patent for the
26 first time at my deposition. As I made clear at the deposition, I had not had the opportunity to
27 study the program closely, and did not know what the purpose of the Blue reference point was. In
28 addition, I did not have access to the source code. Now that I have had the opportunity to review
LaunchTile and the XNav source code, I understand that these programs are performing a re-
alignment function and not the edge-responsive functions of the ’381 patent.

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b. LaunchTile Articles and Slides

30. I have reviewed the articles attached as Exhibits A and B and the slides attached as Exhibits E and H to Dr. Bederson’s declaration. Dr. Van Dam did not rely on Exhibit A as an anticipatory reference, and admitted in his deposition that that article did not disclose all of the limitations of the claims of the ’381 patent. (Ex. J, Van Dam Dep. at 147:9-148: 7; *see also, id.* at 150:10-151:12.) Indeed, these articles and slides do not show or discuss the edge-responsive behaviors of the ’381 patent nor do they disclose any of the supposedly anticipating behaviors shown in Dr. Van Dam’s 2011 video.

31. Because each of these articles and slides disclose the same material features as Exhibit A, I will focus my discussion on that article. This article briefly describes the e-mail application discussed above, including the blue highlight bar which the user moves up and down to select an e-mail. (Ex. O, LaunchTile Article at p. 205-206.) However, the article fails to mention any of the e-mail re-alignment capabilities shown in Dr. Van Dam’s videos. (*Id.*) The article explicitly describes the features of the “World” and “Zone” view as re-aligning to the “Blue” element—not as edge-related features: “Upon thumb release, the zoomspace animates to align Blue with the closest zone’s empty hub. The visual and automated guidance ensures the user is never caught between zones.” (*Id.* at p. 205.) The article does not mention or suggest what can or should happen if the user attempts to scroll beyond the edge of the “World” view. Accordingly, these articles and slides do not disclose all of the elements of the asserted claims or render them obvious.

c. Dr. Bederson’s LaunchTile Videos

32. I have viewed the videos attached as Exhibits D and L to Dr. Bederson’s declaration. I understand that Dr. Van Dam does not rely on these videos to demonstrate anticipation. (Ex. J, Van Dam Dep. at 151:21-152:5.) Like the articles discussed above, these videos do not disclose any of the specific examples depicted in Dr. Van Dam’s 2011 videos. The videos only show the zones moving in a single, forward direction. There is no edge-related behavior or bounce-back action shown, a fact Dr. Bederson readily admitted. (Ex. I, Bederson

1 Dep. at 198:6-25 (stating that videos do not show any bounce back.) Thus the videos do not
2 disclose all the limitations of the asserted claims or render them obvious.

3 **d. Dr. Van Dam's 2011 Videos**

4 33. Finally, I have reviewed the videos attached to Dr. Van Dam's declarations, which
5 I understand are not prior art. Unlike persons of skill in the art at the time of the invention, Dr.
6 Van Dam had the '381 patent in hand when creating these videos, and can use the patent to
7 simulate certain behaviors in the asserted claims. However, as confirmed above, the LaunchTile
8 and XNav software is not behaving in response to the edge of a document being reached. It
9 instead is realigning the view to a central "blue" reference point / selection tool. At best this
10 behavior teaches one of skill in the art that a user can select an item on a list more easily if the
11 item is aligned with a selection tool. Tellingly, none of the allegedly anticipating features
12 demonstrated in Dr. Van Dam's videos were actually disclosed or discussed in the alleged prior
13 art source code, articles, slides or videos. For these reasons, the LaunchTile and XNav references
14 do not anticipate the '381 patent or render it obvious.

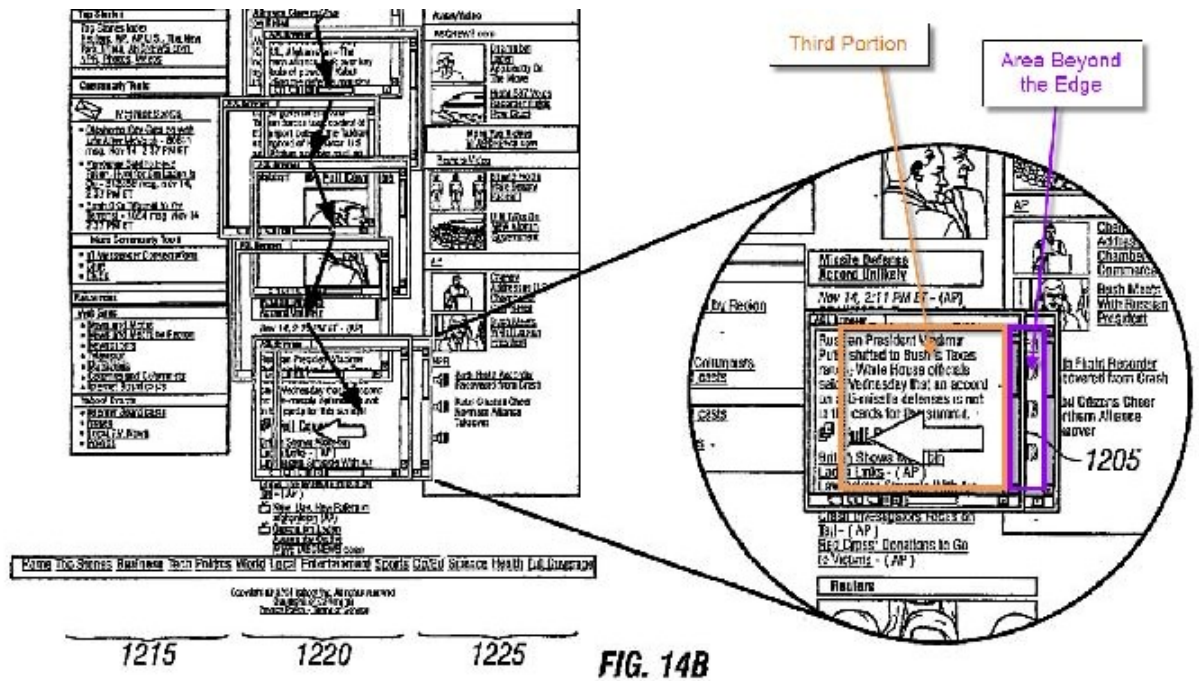
15 **3. Lira**

16 34. Like LaunchTile, Lira discloses methods for realigning or reformatting webpage
17 content so that it can fit more easily into a small screen. (Ex. D, Lira at p. 1, l. 15 - p. 2, l. 3; p.
18 15, ll. 18-25; Claim 1.) Figure 5, for instance, shows a method for reformatting the web page into
19 columns that are viewable on a PDA screen. In Figure 14B (shown below), the display window
20 1205 is realigned with content of column 1220 so that the window can show the entire column.
21 (Ex. D, Lira at Fig. 14B; p. 15, ll. 18-31.)

22 35. The reference does not discuss what will or should happen if the user attempts to
23 move the display window beyond the edge of the webpage. Nor does it disclose the specific
24 solution in the '381 patent: displaying an area beyond the edge of the webpage in response to
25 reaching the edge. On the contrary, the display windows in each figure never move beyond the
26 edges of the webpage; they are always shown within the outer boundaries of the page. (*See, e.g.*
27 *id.* at Fig. 5.) In my opinion, the reference teaches away from the solution of the '381 patent.

28

1 36. Dr. Van Dam again attempts to avoid these flaws by redefining the “edges” of an
 2 electronic document to include column borders *within* the webpage. According to Dr. Van Dam,
 3 when the display moves beyond the “edge” of the column, it is displaying an “area beyond the
 4 edge” of the electronic document. When the display is re-centered to the column, the “document”
 5 is translated in a second direction and the area beyond the edge disappears. He illustrates this
 6 analysis with the following figure:



17 **FIG. 14B**
 18 **Fig. 7 - Van Dam Dec. Ex. 4 (D.I. 168-4) at 11.**

19 37. As discussed in paragraph 24 above, Dr. Van Dam’s definition of “edge” is not
 20 only incorrect but suffers from hindsight bias. As Dr. Van Dam’s figure shows, the display is
 21 centered in the middle of the webpage, and the so-called “Area Beyond the Edge” is still
 22 displaying a portion of the webpage. Indeed, Dr. Van Dam admitted that a user would not know
 23 for sure whether he had moved from one column to another, and that there is nothing preventing
 24 the user from doing so. (*See* Ex. J, Van Dam Dep. at 172:2-173:8.) In my opinion, this figure
 25 would not disclose the advantages of the ’381 patent to a person of skill at the time of the
 26 invention.
 27
 28

4. Van Den Hoven

1
2 38. I have reviewed Dr. Van Dam's discussion of the Van Den Hoven reference (WO
3 01/029702 / U.S. Patent No. 7,152,210). Dr. Van Dam claims that Apple committed inequitable
4 conduct by not disclosing this allegedly anticipating reference to the Patent Office during
5 prosecution of the '381 patent. (Van Dam Dec. (D.I. 168) at ¶ 149.) However, his reliance on
6 Van Den Hoven is misplaced. In my opinion, that reference is cumulative of other references
7 before the Examiner and does not anticipate or obviate the asserted claims.

8 39. Van Den Hoven is cumulative of at least the Collins reference (US 2008/0104544
9 A1), which was cited and considered by the Examiner during prosecution of the '381 patent.
10 Like Van Den Hoven, Collins discloses portable device software that displays a series of icons
11 substantially identical to the sequence of images in Van Den Hoven. (*Compare* Ex. E, Van Den
12 Hoven Fig. 2 to Ex. F, Collins Figs. 1 and 2A.) The user of the Collins system can cause the list
13 of icons to rotate by sliding his or her finger across the touch screen. (*See* Ex. F, Collins at
14 [0034].) This is similar to the scrolling feature of Van Den Hoven, except that in Van Den Hoven
15 the scrolling occurs automatically. (Ex. E, Van Den Hoven at p. 5, ll. 17-21.) According to
16 Collins, when the user attempts to move past the end of the icon list, the list bounces back, *i.e.* the
17 direction of the scrolling is automatically reversed. (*See* Ex. F, Collins at [0038].) Collins and
18 Van Den Hoven thus teach identical behaviors: scrolling through a list of images and reversing
19 direction when the last image is reached. Dr. Van Dam does not point out any material
20 differences between Van Den Hoven and Collins (or, for that matter, any other prior art reference
21 considered by the Examiner).⁶

22 40. Moreover, just like Collins, the Van Den Hoven reference does not disclose at
23 least two key limitations of the asserted claims. First, Van Den Hoven does not disclose
24 displaying an area beyond the edge of the electronic document in response to the edge of the
25 electronic document being reached. As discussed above, when the final image in the sequence is

26
27 ⁶ Dr. Van Dam admits that he did not review all of the references cited on the face of the
28 '381 patent; as a result, he cannot determine whether the references are cumulative. (*See* Ex. J,
Van Dam Dep. at 21:16-22:6.)

1 reached, Van Den Hoven discloses that the list can reverse direction. (Ex. E, Van Den Hoven at
2 p. 6, ll. 1-4.) This features, however, embodies the very “hard stop” issue that the ’381 patent is
3 designed to solve. Dr. Van Dam again attempts to avoid this flaw by asserting that the “border
4 area” around each image thumbnail—that is, the area that makes the thumbnails look like a film
5 strip—corresponds to the area beyond the “edge” of the document. (Van Dam Dec. Ex. 5 (D.I.
6 168-5) at p. 3.) However, this border area is not an area beyond the “edge” of the document, and
7 thus does not satisfy the limitations of the asserted claims.

8 41. Second, Van Den Hoven does not disclose translating the electronic document in a
9 second direction until the area beyond the edge of the electronic document is no longer displayed
10 in response to detecting that the object is no longer on or near the touch screen display. Dr. Van
11 Dam himself admits that there is no such disclosure in Van Den Hoven. (Van Dam Dec. Ex. 5
12 (D.I. 168-5) at p. 5.) Although he suggests that the disclosure may be pieced together from
13 disparate elements within the patent, the reversing operation he points to is not in response to the
14 user lifting his finger.

15 42. Like the other references discussed by Dr. Van Dam, Van Den Hoven does not
16 disclose or discuss the functionality described in the ’381 patent that occur in response to the edge
17 of an electronic document being reached. Indeed, the reference includes the very hard stop
18 problem that the ’381 patent seeks to ameliorate. Accordingly, Van Den Hoven would not teach
19 or inspire one of skill in the art to perform the limitations of the ’381 patent.

20 **C. Infringement**

21 **1. The ’381 Patent Claims Do Not Require Inhuman Precision**

22 43. I understand that Samsung contends that it does not infringe the claims of the ’381
23 patent. I have reviewed Dr. Johnson’s two non-infringement arguments and find them
24 unpersuasive for the reasons stated below

25 44. The plain language of the patent claims, in light of the specification, the
26 understanding in the art, and common sense, does not require that a human finger or stylus move
27 in a mathematically precise line without variation. Rather in my opinion, a person of skill in the
28 art would have understood the term “first direction” to refer to the general course or path on

1 which the object is translated, and not, as Dr. Johnson suggests, an “exact straight line.” Indeed,
2 Samsung’s own expert Dr. Van Dam directly contradicts Dr. Johnson and acknowledges that
3 movement in a general direction is sufficient to constitute a first direction. (Ex. J, Van Dam Dep.
4 at 128:5-129:17.)

5 45. By the time the ’381 Patent was conceived and reduced to practice (and likely well
6 before), it was well understood in the art that a human finger generally did not move in a
7 mathematically precise straight line. The inventors of the ’381 Patent themselves recognized the
8 limitation of human finger precision. The specification states:

9 The user may make contact with the touch screen in the display
10 system 112 using any suitable object or appendage, such as a stylus,
11 a finger, and so forth. In some embodiments, the user interface is
12 designed to work primarily with finger-based contacts and gestures,
13 which are much less precise than stylus-based input due to the
14 larger area of contact of a finger on the touch screen. In some
15 embodiments, the device translates the rough finger-based input
16 into a precise pointer/cursor position or command for performing
17 the actions desired by the user.

18 ’381 Patent at 12:66 to 13:8 (emphasis supplied). Mathematical precision is simply not necessary
19 in order to achieve the purpose of the invention. Because the patent involves moving a finger or
20 other object on a touch screen, a person of ordinary skill would understand that the movements
21 claimed are those that are typically made and are capable of being made by a human. I have
22 reviewed the portions of the specification cited by Dr. Johnson. (Johnson Decl. (D.I. 174) at ¶
23 24.) They do not contradict this common sense understanding of “direction.” To the contrary,
24 they demonstrate that the inventors were aware of the possibility of finger imprecision. (*See, e.g.,*
25 ’381 patent at 29:21-40.)

26 46. Moreover, even if a high degree of precision were required, the devices would still
27 infringe the claims. Dr. Johnson acknowledges that the accused devices will not infringe
28 “[u]nless the document is somehow constrained to translate in only a fixed linear direction.”
(Johnson Decl. (D.I. 174) at ¶ 37.) Each of the accused phones contains a Contacts application
that is constrained to translate documents in only a fixed linear direction. Specifically, the list of
contacts in the Galaxy S 4G, Infuse 4G and Droid Charge can only be translated vertically.
Likewise, the accused Browser application in the Galaxy Tab 10.1 will only translate vertically in

1 at least two situations: (1) when displaying a mobile website (*e.g.* mobile.nytimes.com), or (2)
2 when a website fits horizontally within the browser window (*e.g.* www.cnn.com). Thus, these
3 accused applications infringe claim 1 of the '381 patent even under Samsung's unjustifiably
4 exacting definition.⁷

5 47. Finally, claims 19 and 20 claim devices containing instructions for translating
6 documents in a particular direction. (*See* '381 Patent at Claims 19 & 20.) As stated in my
7 opening report, the accused devices contain such instructions. They thus infringe these claims.⁸

8 2. Showing a Black Area on the Screen Does "Display" Black

9 48. Samsung's defense that the area beyond an edge of a document is not "displayed"
10 if it is shown to the user as a black expanse, because the color black is displayed using unlit
11 pixels, is also unpersuasive. In my opinion, those of skill in the art would easily understand that
12 the term "display" was being used by the '381 Patent in its ordinary sense and that the type of
13 screen technology used does not matter.

14 49. The "displaying" step in claim 1 is not linked to individual screen pixels, but
15 instead refers to whether the screen shows an area beyond the edge of an electronic document.
16 When a user of an accused device scrolls past the edge of a photograph or (on the accused
17 phones) the edge of the contacts list, a black area is shown in the active portion of the screen
18 display. The screen thus "displays" that area, along with a portion of a document, to the user.
19 Contrary to Dr. Johnson's analogy, a device would not be able to display this image if it were
20 turned off.

21 50. This common sense understanding of the word "display" is supported by the
22 specification. The '381 patent will serve the same purpose regardless of what specific color is
23 displayed, and regardless of the type of display used. Indeed, the patent expressly discloses

25 ⁷ It is irrelevant that a user is able move his finger in multiple directions. Claim 1 merely
26 requires that the *electronic document* be translated in a first direction in response to detecting
movement on the touch screen. (*See* '381 Patent at Claim 1.)

27 ⁸ I also note that Dr. Johnson has not looked to see whether the source code ignores minor
28 variations in finger positioning. XNav, for instance, does contain such code. (*See* Ex. I,
Bederson Dep. at 128:22-130:10.)

1 “displaying” the area beyond the edge of an electronic document using a solid color, including
2 black. (’381 patent at 27:30-36 & Claim 13.) The specification also expressly states that any
3 suitable display technology may be used: “The touch screen in the display system 112 may use
4 LCD (liquid crystal display) technology, or LPD (light emitting polymer display) technology,
5 although other display technologies may be used in other embodiments.” (’381 Patent at 12:42 -
6 45.) This same passage specifically discloses the use of light emitting polymer displays as well as
7 other display technologies. These teachings flatly contradict Dr. Johnson’s non-infringement
8 opinion.

9 51. Moreover, those of ordinary skill in the art know that OLED screens do “display”
10 black. As one of Samsung’s own patents succinctly puts it, “black is displayed on the screen of
11 the OLED display when no current flows through the corresponding OLED LD and the OLED
12 LD does not emit light.” (Ex. G, U.S. 7,965,263 at 9:56 - 59; *see also*, Ex. H, U.S. 2007-0080907
13 at [0107] & Fig. 8 (“Next, when the second field T2 is started, a black color is displayed from the
14 top end of the screen. . . .”).) Samsung’s contention that it avoids infringement because certain of
15 its screens, like other types of screens, displays black by not emitting light is not persuasive in my
16 opinion.

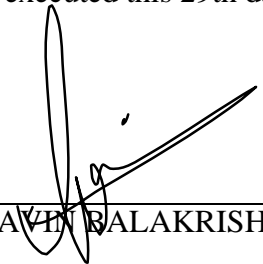
17 52. Finally, it should be noted that this argument does not avoid infringement of the
18 Galaxy Tab 10.1, which uses an LCD screen and displays a grey border when the user scrolls past
19 the edge of a webpage. Moreover, claims 19 and 20 require that the device contain instructions
20 for performing various tasks. As I stated previously the devices do contain instructions for
21 displaying.

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53. I have reviewed the portions of the specification cited by Dr. Johnson. (Johnson Decl. (D.I. 174) at ¶ 38.) In general, they simply state that a touch screen can display images. A person of skill in the art would understand that such images may or may not contain black. These passages do not show that the inventors adopted an uncommon definition for the common word “display.”

I declare under penalty of perjury under the laws of the United States of America that the forgoing is true and correct and that this Declaration was executed this 29th day of September, 2011, at Washington, DC.

Dated: September 29, 2011

/s/ 
RAVIN BALAKRISHNAN