

1 QUINN EMANUEL URQUHART & SULLIVAN, LLP  
Charles K. Verhoeven (Cal. Bar No. 170151)  
2 charlesverhoeven@quinnemanuel.com  
50 California Street, 22<sup>nd</sup> Floor  
3 San Francisco, California 94111  
Telephone: (415) 875-6600  
4 Facsimile: (415) 875-6700

5 Kevin P.B. Johnson (Cal. Bar No. 177129)  
kevinjohnson@quinnemanuel.com  
6 Victoria F. Maroulis (Cal. Bar No. 202603)  
victoriamaroulis@quinnemanuel.com  
7 555 Twin Dolphin Drive 5<sup>th</sup> Floor  
Redwood Shores, California 94065  
8 Telephone: (650) 801-5000  
Facsimile: (650) 801-5100

9 Michael T. Zeller (Cal. Bar No. 196417)  
10 michaelzeller@quinnemanuel.com  
865 S. Figueroa St., 10th Floor  
11 Los Angeles, California 90017  
Telephone: (213) 443-3000  
12 Facsimile: (213) 443-3100

13 Attorneys for SAMSUNG ELECTRONICS  
CO., LTD., SAMSUNG ELECTRONICS  
14 AMERICA, INC. and SAMSUNG  
TELECOMMUNICATIONS AMERICA, LLC  
15

16 UNITED STATES DISTRICT COURT

17 NORTHERN DISTRICT OF CALIFORNIA, SAN JOSE DIVISION

18 APPLE INC., a California corporation,

19 Plaintiff,

20 vs.

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

24 Defendants.  
25

CASE NO. 11-cv-01846-LHK

**DECLARATION OF ANDRIES VAN  
DAM, PH.D. IN SUPPORT OF  
SAMSUNG'S OPPOSITION TO APPLE'S  
MOTION FOR A PRELIMINARY  
INJUNCTION**

Date: October 13, 2011

Time: 1:30 p.m.

Place: Courtroom 8, 4th Floor

Judge: Hon. Lucy H. Koh

26  
27  
28  
Case No. 11-cv-01846-LHK

**DECLARATION OF ANDRIES VAN DAM, PH.D. IN SUPPORT OF SAMSUNG'S OPPOSITION TO  
APPLE'S MOTION FOR A PRELIMINARY INJUNCTION**

1 I, Andries van Dam, declare:

2 1. I am a tenured professor in the Computer Science department of Brown University,  
3 where I hold the position of Thomas J. Watson, Jr. University Professor of Technology and  
4 Education Chair and am also a Professor of Computer Science. I have been asked to provide an  
5 expert declaration on behalf of Samsung Electronics Co. Ltd., Samsung Electronics America, Inc.,  
6 and Samsung Telecommunications America, LLC (collectively “Samsung”) in the above-  
7 captioned case.

8 2. I submit this declaration in support of Samsung’s Opposition to Apple’s Motion for  
9 a Preliminary Injunction. If asked at hearings or trial, I am prepared to testify regarding the  
10 matters I discuss in this declaration.

11 3. I reserve the right to supplement or amend this declaration based on any new  
12 information that is relevant to my opinions.

13 4. I am being compensated for my work in this matter at the rate of \$1000 per hour  
14 plus expenses. My compensation is in no way tied to the outcome of this matter.

15 I. PROFESSIONAL BACKGROUND

16 5. A detailed record of my professional qualifications is attached as Exhibit 1 to this  
17 declaration and summarized below.

18 6. I received a B.S. in Engineering Sciences from Swarthmore College in 1960, and  
19 an M.S. and Ph.D. in Electrical Engineering from the University of Pennsylvania in 1963 and  
20 1966 respectively.

21 7. I have taught at Brown University since 1965, where I started as an Assistant  
22 Professor teaching Computer Science in the Division of Applied Mathematics. In 1968 I became  
23 a tenured Associate Professor of Applied Mathematics, and in 1972 I was promoted to Full  
24 Professor. In 1976, I became a Professor of Computer Science, and have taught Computer  
25 Science continuously since 1965. I have held various positions at Brown University, including  
26 Chairman of the Computer Science Program (1976-1979), Founding Chairman of the Department  
27 of Computer Science (1979-1985), L. Herbert Ballou University Professor Chair (1992-1995),  
28 Thomas J. Watson, Jr. University Professor of Technology and Education Chair (1995-present),

1 and Vice President for Research (2002-2006). I have also served as a visiting professor on  
2 Sabbatical leave to teach and start research groups in Computer Graphics at University of  
3 Nijmegen in the Netherlands and University of Geneva in Switzerland.

4 8. I have also served as the Director of the National Science Foundation Science &  
5 Technology Center for Computer Graphics and Scientific Visualization (the STC). The STC was  
6 physically located across 5 universities, including Brown and ran for its allotted 11 years, with its  
7 financial home at the University of Utah. In my role as director, which I filled for three years, I  
8 was logistically responsible for the operation and the research programs of the Center.

9 9. While on my year's Sabbatical at the University of Geneva in 1978-79 I was also  
10 Visiting Scientific Associate at CERN, the European Nuclear Research Institute in Geneva and  
11 was invited back for many visits to consult and lecture. While at CERN as a Visiting Scientific  
12 Associate, I co-designed a special-purpose microcomputer specializing in fast event processing for  
13 handling data from physics experiments, and its microprogramming, and gave various lectures.  
14 My subsequent visits generally involved consultation on a variety of subjects relating to  
15 workstations, scientific visualization, and hypermedia.

16 10. I have over forty years of experience in the fields of computer graphics,  
17 hypermedia systems and user interfaces. In my research, I have recently worked on projects  
18 relating to pen- and touch-centric computing, educational software, and electronic book authoring  
19 and delivery systems. I have authored or co-authored 120 articles, 9 books, and 3 National  
20 Research Council Reports. I have presented over 44 invited lectures since 2000. My lectures in  
21 the past two decades have been primarily focused on the area of interaction in immersive virtual  
22 environments and scientific visualization, with a recent focus on pen- and touch- computing. I  
23 have publicly shown work on pen computing on tablet PCs and touch computing on Microsoft  
24 Surface devices, using both research-based and commercial devices. I have most recently  
25 focused on applications in digital humanities (or, as it has become known, "e-humanities"). For  
26 example, I worked on a humanities project called Large Artwork Displayed on the Surface  
27 (LADS) for examining large pieces of artwork on any touch-enabled surface supported by  
28 Windows 7. I also recently helped design a scholarship tool to allow users to easily create

1 selections of hyperlinked multimedia documents, entitled WorkTop. Before we acquired a  
2 Microsoft Surface, my students had built our own “touch table,” a “home brew” prototype touch  
3 device, for which we had created multiple applications. My group’s most recent work on touch  
4 computing has been sponsored by both Microsoft Research and Sharp. I have shown multiple  
5 unpublished projects using touch computing at the annual Microsoft Faculty Summit. My group  
6 and I have also produced the Garibaldi Panorama Application, a precursor to LADS, which was  
7 shown to thousands of people as a key exhibit in a special exhibit at British Library on the future  
8 of digital scholarship.

9 **II. APPLICABLE LEGAL PRINCIPLES**

10 11. I am informed by counsel that “prior art” includes public information, public  
11 knowledge, and public acts that occur before an application for a patent was filed. Prior art  
12 includes patents, journals, Internet publications, systems and products.

13 12. I am further informed by counsel that prior art renders a patent claim invalid by  
14 anticipation if the reference discloses each element of the claim, either expressly or inherently,  
15 from the point of view of a person of ordinary skill in the art at the time the claimed invention was  
16 made. I understand that an element of a claim is inherent if it is necessarily present in an item of  
17 prior art. In my opinion, a person of ordinary skill in the art would have a computer science  
18 degree, and 3-5 years of software design and implementation experience, including experience  
19 with graphical user interface design, or would have equivalent educational and work experience.

20 13. I am informed by counsel that even if a patent is not anticipated, it is still invalid if  
21 the differences between the claimed subject matter and the prior art are such that the subject matter  
22 as a whole would have been obvious at the time the invention was made to a person of ordinary  
23 skill in the pertinent art. I further understand that a person of ordinary skill is a hypothetical  
24 person who is presumed to be aware of all the pertinent art. I understand that a person of ordinary  
25 skill in the art provides a reference point from which the prior art and claimed invention should be  
26 viewed. This reference point prevents one from using her own insight or hindsight in deciding  
27 whether a claim is obvious.

28

1           14.     I have been informed that claims directed to a combination of familiar elements  
2 according to known methods are invalid as obvious when the combination does no more than yield  
3 predictable results.

4           15.     I also understand that practical and common sense considerations should guide a  
5 proper obviousness analysis, because familiar items may have obvious uses beyond their primary  
6 purposes. For example, I understand that if a technique has been used to improve one device, and  
7 a person of ordinary skill in the art would recognize that it would improve similar devices in the  
8 same way, using the technique is obvious unless its actual application is beyond her skill.

9           16.     I understand that an obviousness evaluation can be based on a combination of  
10 multiple prior art references. I understand that prior art references themselves may provide a  
11 suggestion, motivation, or reason to combine elements of multiple prior art references in the way  
12 the claimed new invention does. I further understand that the nexus linking two or more prior art  
13 references or practices may be simple common sense.

14           17.     I further understand that a claim can be obvious in light of a single reference,  
15 without the need to combine references, if the elements of the claim that are not found explicitly or  
16 inherently in the reference can be supplied by the common sense and knowledge of one of skill in  
17 the art.

18           18.     I understand that obviousness analysis takes into account the inferences and  
19 creative steps that a person of ordinary skill in the art would employ under the circumstances,  
20 because a person of ordinary skill in the art looking to overcome a problem will often be able to fit  
21 the teachings of multiple publications together like pieces of a puzzle.

22 **III.     MATERIALS CONSIDERED**

23           19.     In forming my opinions in this declaration, I reviewed a number of materials,  
24 including U.S. Patent No. 7,469,381 (“the ‘381 patent”), its prosecution file history, its  
25 reexamination file history, and the references cited therein. I also reviewed Dr. Ravin  
26 Balakrishnan’s Declaration In Support of Apple’s Motion for a Preliminary Injunction, as well as  
27 the portions of Dr. Balakrishnan’s deposition transcript that I have been permitted to review to  
28

1 date. I have also reviewed the materials cited in this declaration and in the charts attached to this  
2 declaration as Exhibits 2 - 5.

3 IV. OVERVIEW OF THE '381 PATENT AND THE ASSERTED CLAIMS

4 20. The '381 Patent, titled "List Scrolling and Document Translation, Scaling, and  
5 Rotation on a Touch-Screen Display," was filed on December 14, 2007 and issued on December  
6 23, 2008. It claims priority to a number of provisional applications, the earliest of which was  
7 filed on January 7, 2007. The patent has one named inventor, Bas Ording.

8 21. The '381 Patent's claims relate to a method of translating an electronic document  
9 displayed on a touch screen display in response to detecting movement of an object on or near the  
10 touch screen. The '381 Patent describes a "snap-back" feature where, if the user translates an  
11 electronic document beyond the edge of that document, an area beyond that edge will be  
12 displayed. When the user lifts her finger from the touch screen, the document will "snap" back so  
13 that the edge of the document is aligned with the edge of the screen, such that no area beyond the  
14 edge of the document remains in view.

15 22. I understand that Apple has asserted that Samsung's devices infringe claims 1-5, 7,  
16 9-10, 13-14, 16, 19-20 of the '381 Patent in its Motion for a Preliminary Injunction. Claims 1,  
17 19, and 20 are independent claims, and the remaining claims are dependent on claim 1.

18 V. CLAIM CONSTRUCTION

19 23. I understand that the Court has not yet issued a claim construction order in this  
20 case. In this declaration, I have attempted to apply the claim constructions that Apple and Dr.  
21 Balakrishnan appear to have applied. My understanding of those claim constructions is based on  
22 my review of Dr. Ravin Balakrishnan's Declaration In Support of Apple's Motion for a  
23 Preliminary Injunction, as well as the portions of Dr. Balakrishnan's deposition transcript that I  
24 have been permitted to review to date, as well as my review of the claim chart Apple filed in  
25 conjunction with its action before the ITC against HTC Corp., *In the Matter of Certain Portable*  
26 *Electronic Devices and Related Software*, Investigation No. 337-TA-797.

27 VI. PRIOR ART OVERVIEW

28

1           24.     I understand that Benjamin Bederson and his colleagues created a graphical user  
2 interface for mobile devices in 2004 known as LaunchTile. I understand that Dr. Bederson and  
3 his colleagues created a variant of the LaunchTile software, which they entitled XNav.

4           25.     I have reviewed the declaration of Benjamin Bederson , as well as exhibits to that  
5 declaration, in forming my opinions in this declaration. I have also personally used a Compaq  
6 iPaq h1900 series model 1950 PocketPC device running LaunchTile, as well as a Sony VGN-  
7 U750P tablet device running XNav, in forming my opinions.

8           26.     I have also provided guidance to attorneys regarding the preparation of screenshots  
9 appearing in this declaration demonstrating the functionality of the LaunchTile and XNav  
10 software, and approved the screenshots appearing herein. I likewise guided and approved the  
11 preparation of videos attached to this declaration as Exhibits 6 - 11.

12           27.     I understand that the LaunchTile application was presented at two events in 2005 -  
13 the ACM Conference on Human Factors in Computing Systems, known as the CHI Conference, in  
14 April 2005, and a symposium at the Human-Computer Interaction Lab at the University of  
15 Maryland in May 2005, known as the HCIL Symposium. I further understand that Dr.  
16 Bederson's team discussed their work on LaunchTile at these events. I also understand that Dr.  
17 Bederson's team gave live demonstrations of a prototype LaunchTile device at the HCIL  
18 Symposium. I also understand that a device running XNav, as well as a device running  
19 LaunchTile, was demonstrated in a video presentation that Dr. Bederson made available on his  
20 web page around April 2005. I further understand that Dr. Bederson provided source code for the  
21 XNav application to Microsoft in August 2005, and that this source code was made available to  
22 Microsoft without any restriction on Microsoft's ability to reproduce, use, or disseminate that  
23 code.

24           28.     I have been provided with a copy of XNav source code. I have examined portions  
25 of this code in forming my opinions herein.

26           29.     I understand from Dr. Bederson's declaration and from my own review of the  
27 XNav software that XNav has identical or substantially similar functionality to the relevant  
28 LaunchTile functionality described below. In the remainder of my declaration, unless otherwise

1 noted, my discussion and opinions regarding LaunchTile apply equally to the corresponding  
2 functionality in XNav.

3         30.       LaunchTile contains a prototype e-mail application. Using this prototype  
4 application, a user is presented with an inbox comprised of a vertical list of e-mails. LaunchTile  
5 allows the user to touch the screen and drag a finger or stylus upward or downward, to scroll up or  
6 down through this e-mail list. When the user reaches the end of the list by scrolling, if the user  
7 continues to scroll in the same direction, LaunchTile indicates that the user has scrolled beyond  
8 the edge of the list (“over-scrolled”). It does so by displaying an area of empty space (*i.e.*, an area  
9 of a solid color) below the last e-mail in the list. If the user’s over-scroll does not exceed a  
10 threshold distance, after the user ends the scrolling operation by lifting their finger or their stylus  
11 off the touch screen LaunchTile will perform an animated “elastic snap” to move the e-mail list  
12 back by scrolling in the opposite direction. As a result of this “snap,” the top or bottom boundary  
13 of the e-mail list becomes aligned with the boundary of the e-mail display window. Alternatively,  
14 if the user’s over-scroll continues beyond a threshold distance, the area of empty space will remain  
15 displayed when the user lifts their finger or stylus off the touch screen.

16         31.       A similar animated “snap” operation is used for LaunchTile’s tile navigation  
17 system. The LaunchTile application contains a set of 36 tiles, each representing an application.  
18 The entire set of 36 tiles is called a “World;” the World is divided into nine “Zones” of four tiles  
19 each. As shown below, the “World” view displays all nine “Zones:”

20  
21  
22  
23  
24  
25  
26  
27  
28





**World**

**Zone**

32. A LaunchTile user looking at the World can view a Zone by pressing on a blue button in the center of the Zone. The user can then swipe her finger to scroll to a neighboring Zone. The user may lift her finger while performing the swiping gesture; when this happens, if the user has not swiped beyond a threshold distance in the direction of the next Zone, the current Zone will “snap” back into its previous position, aligning the edges of the Zone with the edges of the screen. See below paragraphs 39 - 68.

33. In addition to the LaunchTile and XNav systems, a number of prior art publications disclose techniques recited in the ‘381 patent’s claims. For example, WO 03/081458 to Lira (and U.S. Patent No. 7,872,640 to Lira) disclose methods for browsing a large electronic document, such as a web page or column of a web page, using a small touch-screen display, by scrolling through the page using their finger or a stylus. When the user lifts their finger or stylus off the touch-screen display, Lira will “snap” the browsing window to the edge of the nearest column of

1 the web page. Lira further discloses that this “snap” feature “can also be animated to provide an  
2 appearance of movement as the display scrolls.” (*Id.* at 15.) The Lira reference is discussed in  
3 greater detail in Exhibit 4.

4 34. Likewise, U.S. Patent No. 7,152,210 to Van Den Hoven (from PCT/EP00/10286)  
5 discloses scrolling operations for electronic documents (digital images) in response to touch-  
6 screen input. These operations include modifying scrolling in response to a user removing their  
7 finger from a touch-screen display, as well as operations for reversing the direction of translation.  
8 The Van Den Hoven reference is discussed in greater detail in Exhibit 5.

9 VII. INVALIDITY

10 35. I have compared the LaunchTile and XNav applications with the claims of the ‘381  
11 Patent. In my opinion, LaunchTile and XNav each disclose each and every limitation of the  
12 asserted claims of the ‘381 patent. In addition, in the event that either LaunchTile or XNav do  
13 not disclose each and every limitation of the asserted claims of the ‘381 patent, in my opinion the  
14 claims would be obvious in light of either of these two systems..

15 36. Attached hereto as Exhibits 2 and 3 are detailed charts comparing the LaunchTile  
16 and XNav systems to the claims of the ‘381 patent. These charts support and form the basis for  
17 my opinions, and I incorporate those charts herein by reference.

18 37. Moreover, in my opinion the Lira and Van Den Hoven references each disclose  
19 each and every limitation of the asserted claims of the ‘381 patent and/or render those claims  
20 obvious. Attached hereto as Exhibits 4 and 5 are detailed charts comparing the Lira and Van Den  
21 Hoven references to the claims of the ‘381 patent. These charts also support and form the basis  
22 for my opinions, and I incorporate those charts herein by reference.

23 38. Below I discuss particular disclosures relating to LaunchTile. As explained above,  
24 XNav has identical or substantially similar functionality to the LaunchTile functionality described  
25 below, and my discussion of and opinions regarding LaunchTile below apply equally to  
26 corresponding functionality in XNav.

27 A. Claim 1

28 1. Preamble

1           39.     The Preamble recites “A computer-implemented method.” A mobile computing  
2 device running the LaunchTile application includes a computer-implemented method. For  
3 example, I ran the LaunchTile program on a Compaq iPaq h1900 series model 1950 PocketPC<sup>1</sup>,  
4 which is a mobile computing device that includes a Samsung SC32442 processor and main  
5 memory of 32 MB SDRAM. See Ex. 12 at B-1 (Compaq iPaq h1900 Series Manual); Ex. 13 at p.  
6 3 (HP iPaq 1950 Pocket PC QuickSpecs).

7                     2.     Element 1

8           40.     Element 1 of claim 1 recites: “[method] comprising: at a device with a touch screen  
9 display.”

10          41.     The Compaq iPaq h1900 series model 1950 PocketPC has a touchscreen display.  
11 For example, this device responds to touches from a stylus or a finger. LaunchTile runs on the  
12 Compaq iPaq h1900 series model 1950 PocketPC device and other similar devices with touch  
13 screen displays.



23  
24  
25           <sup>1</sup> It is my understanding that the LaunchTile application can also run on any number of  
26 Windows Mobile devices other than the Compaq iPaq h1900 series PocketPC as well. As noted  
27 above, I have personally used LaunchTile on a Compaq iPaq h1900 series model 1950 PocketPC  
28 device. My opinions with regard to a Compaq iPaq h1900 series model 1950 PocketPC running  
LaunchTile apply equally to any other touch screen device that is capable of running the  
LaunchTile software.

1           42.     It is my opinion that LaunchTile running on a Compaq iPaq h1900 series model  
2 1950 PocketPC discloses this element of Claim 1.

3           3.     Element 2

4           43.     Element 2 of claim 1 recites: “displaying a first portion of an electronic document.”

5           44.     LaunchTile displays a first portion of an electronic document. I discuss several  
6 representative examples below.

7           45.     In my opinion, a person of ordinary skill in the art would understand that electronic  
8 documents, like their real-life counterparts, can be arranged in a hierarchy. Accordingly, the  
9 electronic document recited in claim 1 may itself contain sub-documents. Likewise, the  
10 electronic document recited in claim 1 may itself be a sub-document within the hierarchy of some  
11 other electronic document. This concept is familiar from the real world, in which a document  
12 such as a book, binder, or legal pleading may contain many sub-documents, such as chapters,  
13 individual pages, or exhibits. Likewise, a document such as a page or an exhibit may itself be  
14 part of a larger document.

15           46.     My opinion is supported by my review of a claim chart Apple filed in conjunction  
16 with its complaint before the ITC against HTC Corp., *In the Matter of Certain Portable Electronic*  
17 *Devices and Related Software*, Investigation No. 337-TA-797. In Apple’s claim chart for the  
18 ‘381 patent (Ex. 13 to its Complaint), Apple has asserted that the electronic document recited in  
19 claim 1 includes an electronic document comprised of multiple individual sub-documents, such as  
20 contiguous digital images.

21           47.     My opinion is further supported by Dr. Balakrishnan’s deposition testimony. In  
22 that testimony, Dr. Balakrishnan defined an electronic document in the context of the ‘381 patent  
23 claims as something that can be visually representable on a screen and that has a defined set of  
24 boundaries, such as (but not limited to) length and width:

25           Q. Is the electronic doc -- what -- what does an "electronic document" mean in the context  
26 of this patent?

27           MR. MONACH: Object to form to the extent it's calling for a legal conclusion, but you can  
28 give your views on that.

1 THE WITNESS: In the context of this patent, my understanding, having read the patent  
2 and the claims, is the electronic document is some visual representation on the screen that  
3 has a defined length and a width, as an example, or defined set of boundaries, because they  
may not have to be a rectangular set of boundaries.

4 MR. JOHNSON: Q. So can it – it can be anything with a defined length and width?

5 A It could be any visually represented thing with a defined boundary. I'd rather use  
6 the word "boundaries," because length and width may connote a rectangular thing. It may  
not be a rectangle, necessarily.

7 Q Okay. So an electronic document is anything that can be visually represented with a  
8 defined boundary?

9 MR. MONACH: Object to the form of the question; object as calling for a legal  
10 conclusion.

11 THE WITNESS: In the context of this patent and the claims, reading the patent and the  
12 claims, I would say that would be a -- my definition of an electronic document would be  
something visually representable on the screen that -- that has a defined set of boundaries.

13 Balakrishnan Dep. Tr. at 27:13-28:18. Dr. Balakrishnan also testified that within a six-by-six grid  
14 of thirty-six rectangular shapes, each with a visual boundary, a hierarchy of documents may be  
15 present: an electronic document could be “one of these, let me call it sub rectangles,” and further  
16 “could be some combination of them,” depending “on how, you ,now, you want to put the  
17 boundary around it.” *Id.* at 152:10-23. This combination of “sub rectangles” forming an  
18 electronic document could include, for example, a two-by-four grid of sub-rectangles as one  
19 electronic document (*id.* at 152:24-153:19, referencing Ex. 104). Dr. Balakrishnan further  
20 explained that al electronic document does not need to be comprised of a hierarchical structure  
21 such as a grid with sub-documents: “I think the electronic doesn’t have to be anything to do with  
22 the grid. It – it’s any visual thing with defined boundaries – by my definition of it.” *Id.* at 155:2-  
23 9 (objections and interruptions omitted). Dr. Balakrishnan also testified that a “portion” of an  
24 electronic document may be any area of that document, including the entirety of the document; for  
25 example, an entire digital image can constitute one “portion” of that image. *Id.* at 146:15-19.

26 48. **Representative Example #1.** In one example, LaunchTile includes an email  
27 program capable of displaying a list of email messages, such as an inbox, as an electronic  
28

1 document. The computing device will display a portion of the email list as a first portion, shown  
2 below in green outline:



10 49. **Representative Example #2.** In another example, the electronic document is a  
11 Zone in LaunchTile. As described above a Zone is a collection of four individual tiles. I  
12 understand that these tiles are typically individual image files (.png files). Each tile is itself an  
13 electronic document, and a Zone comprised of four adjacent tiles is also an electronic document.  
14 (As described below in Representative Example #3, in my opinion other configurations of  
15 adjacent tiles are also electronic documents; for example, eight tiles, or two Zones, can constitute  
16 the electronic document recited in claim 1.) My opinion is supported by Apple’s apparent  
17 construction of this term in its infringement contentions in other litigation involving the ‘381  
18 patent (Ex. 13 to its Complaint against HTC, discussed above), where Apple has identified an  
19 “electronic document” comprised of multiple contiguous digital images. This is consistent with  
20 the ordinary meaning of document in the electronic sense or in the real world. In this example,  
21 the electronic document is the Zone located in the center of the World view. This Zone is  
22 outlined in green in the picture below:  
23

24  
25  
26  
27  
28

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

Electronic document



50. When the user enters Zone view (e.g., from the World view or from the Application Tile view), the user will see a single Zone. The user can scroll to a neighboring Zone by touching the touch screen device with a finger or a stylus and moving the finger or stylus. If the user begins in the center Zone and moves to the left, a first portion of the Zone will be displayed. The first portion is depicted in the picture below, outlined in green:

First portion



51. As shown above, when the user scrolls to the left, the four tiles comprising the Zone also move left. The dark blue button at the center of the screen, which is an interactive button, is not an element of any one of these four tiles or the Zone they comprise. The button is instead a control element of the user interface. These elements are collectively referred to as “chrome,” “decoration,” or “window dressing” in the field. The blue button, which is one “chrome” element of the overall LaunchTile user interface’s “chrome,” is a zoom control button that operates as an alternative to other classic zoom control elements, such as sliders or a graphical

1 magnifying glass. It thus does not scroll with the Zone; it remains centered while the Zone  
2 moves, because it is an area that is effectively superimposed over the Zone in two-dimensional  
3 space. It is typical for some of the “chrome” elements of a user interface, such as pop-up menus  
4 and dialogue boxes, to be displayed as effectively superimposed over content. Graphical user  
5 interfaces are often comprised of several composite layers, which are displayed according to  
6 different “z-ordering” values assigned to different layers for purposes of window management.

7 52. **Representative Example #3.** As discussed above, any set of contiguous tiles  
8 could be considered an electronic document. Accordingly, two contiguous Zones comprised of  
9 eight tiles would also constitute the electronic document recited in claim 1.

10 53. As noted above, my opinion is supported by the ordinary meaning of document in  
11 the electronic and real-world sense, as well as by Apple’s apparent construction of this term in  
12 parallel litigation. My opinion is also based on my application of Dr. Balakrishnan’s own  
13 construction of the claim terms. Dr. Balakrishnan testified that the “electronic document” recited  
14 in the ‘381 patent’s claims “could be some combination of” sub-documents, depending “on how,  
15 you know, you want to put the boundary around it.” Balakrishnan Dep. at 152:10-23. This  
16 arrangement could include, for example, a two-by-four grid of sub-documents as one electronic  
17 document (*id.* at 152:24-153:19, referencing Ex. 104).

18 54. Two contiguous Zones comprised of eight tiles are shown outlined in green below:



28



1           55.     In this example, a first portion of the electronic document is shown in the figure  
2 below.   When the user enters Zone view (e.g., from the World view or from the Application Tile  
3 view), the user will see four tiles that constitutes a first portion of an electronic document  
4 comprised of eight tiles.   Thus, the four tiles displayed in the figure below are one portion of an  
5 eight-tile, two-Zone document.



15           4.     Element 3

16           56.     Element 3 of claim 1 recites: “detecting a movement of an object on or near the  
17 touch screen display; in response to detecting the movement, translating the electronic document  
18 displayed on the touch screen display in a first direction to display a second portion of the  
19 electronic document, wherein the second portion is different from the first portion.”

20           57.     Representative Example #1.   In one example, a Compaq iPaq h1900 series model  
21 1950 PocketPC running LaunchTile will detect movement of an object, including either a finger or  
22 a stylus, on the touch screen display of the device on which it is running.   In response to that  
23 detected movement, the application will scroll the list up so that a second portion of the email list  
24 is displayed:

25

26

27

28

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

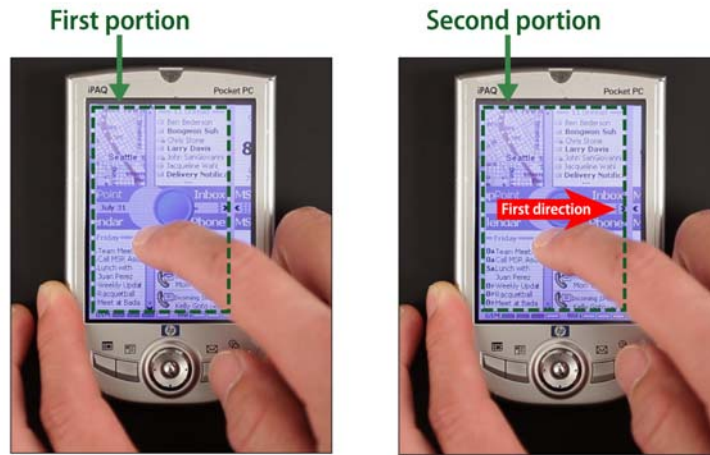


58. **Representative Example #2.** In another example, in response to that detected movement, the application will scroll the displayed Zone in the same direction as the movement. For context, as shown below, the “first portion” in Representative Example #2 was obtained by having previously scrolled slightly to the left:

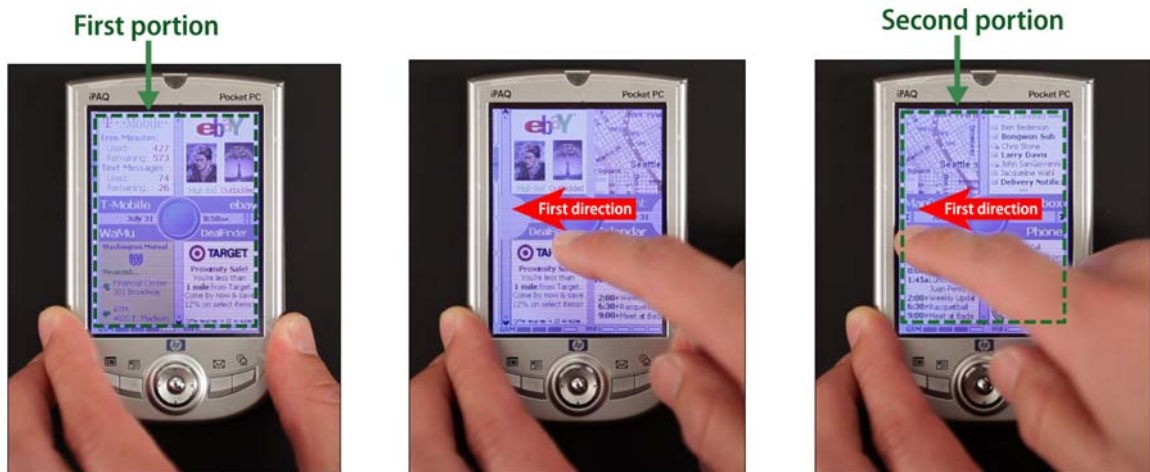


Continuing from this position, if the user swipes her finger to the right, the electronic document will move to the right. A second portion of the electronic document is then displayed. This

1 second portion of the document is different from the first portion of the document. This is  
2 depicted in the figures below:<sup>2</sup>



11 59. **Representative Example #3.** In another example, where two contiguous Zones  
12 form a single electronic document, a second portion of that document is displayed when the user  
13 scrolls. For example, if the user scrolls left, a second Zone comprising the second half of the  
14 eight-tile electronic document will be displayed. In the sequence below, the first image illustrates  
15 the starting point just prior to a scrolling operation, and the second and third images represent  
16 partial movement during the scrolling operation:

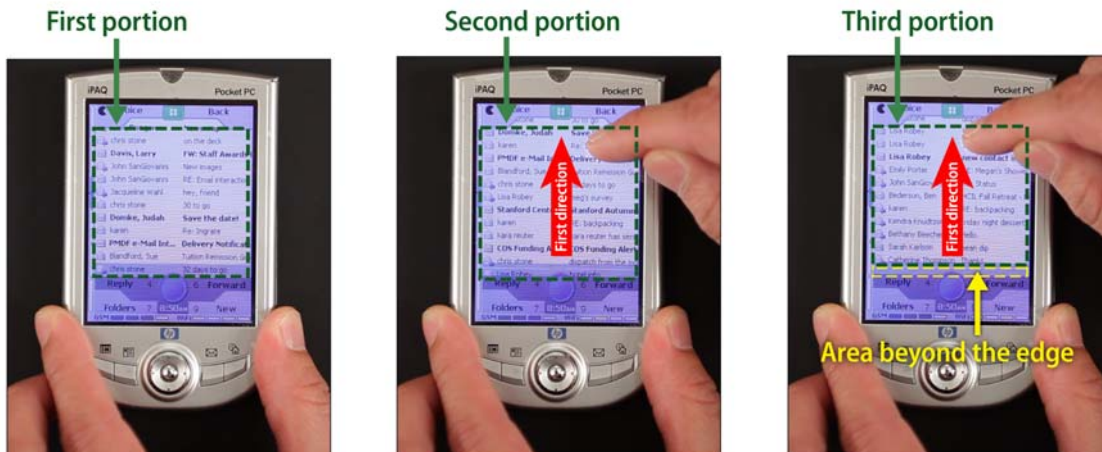


26 <sup>2</sup> In the representative examples discussing a first or second “direction”, the direction in  
27 which the LaunchTile device is scrolled is representative – not exhaustive. My opinions are of  
28 course not limited to the specific scrolling directions used in these screenshots.

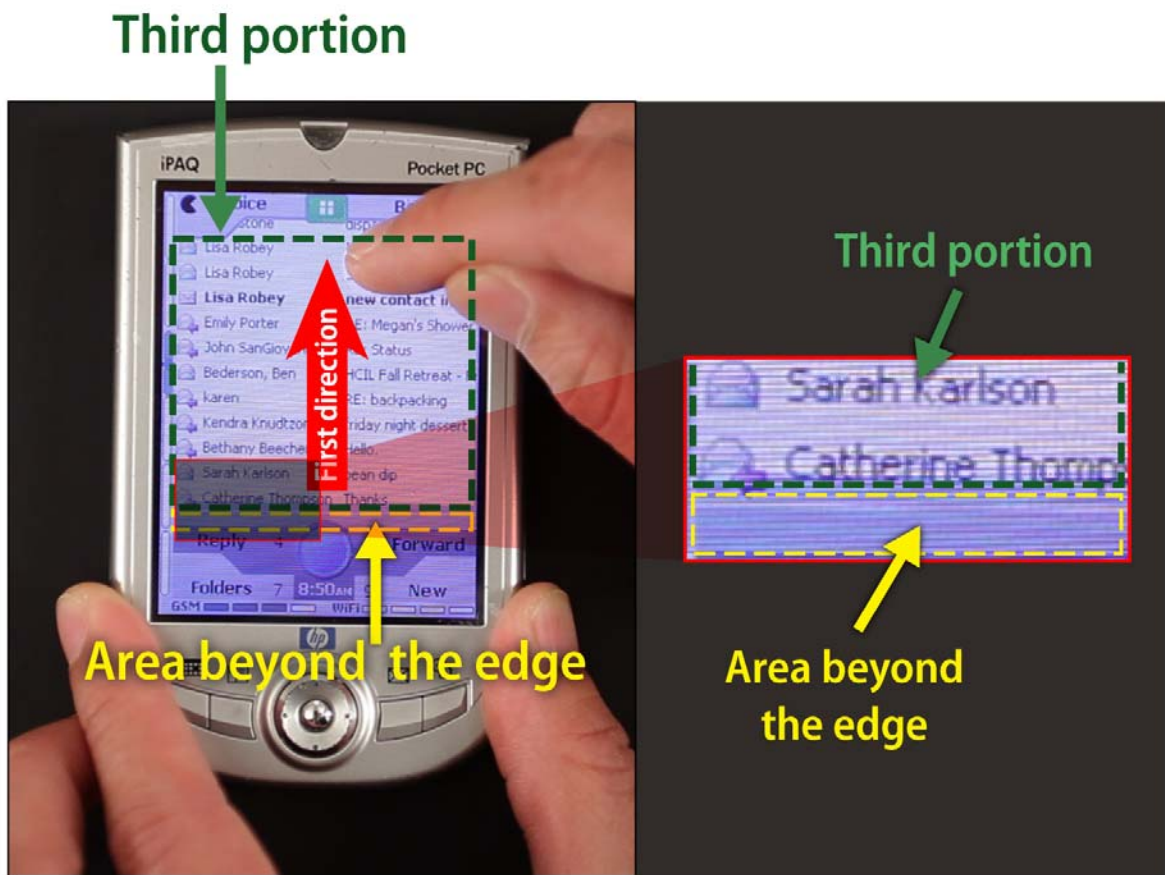
1                   5.        Element 4

2                   60.        Element 4 of claim 1 recites: “in response to an edge of the electronic document  
3 being reached while translating the electronic document in the first direction while the object is  
4 still detected on or near the touch screen display: displaying an area beyond the edge of the  
5 document, and displaying a third portion of the electronic document, wherein the third portion is  
6 smaller than the first portion.”

7                   61.        Representative Example #1. In one example, in the email program, when the  
8 user reaches the bottom of the email list when scrolling up, the edge of the email list is displayed.  
9 Beyond that edge a blank area is also displayed. This blank area is not part of the electronic  
10 document that consists of the email list. This results in the display of a third portion of the  
11 document, which is smaller than the first portion of the document, because of the blank area.



1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28



62. **Representative Example #2.** In another example, as the user reaches the left edge of a Zone while scrolling to the right in the example discussed above, an area beyond the left edge of that Zone will be displayed. That area will consist of a solid-colored “gutter,” or border, followed by the neighboring Zone on the left. As the user continues scrolling to the right, a third portion of the electronic document is displayed that is smaller than the first portion of the electronic document because more of the electronic document has been scrolled off the screen. The third portion and the area beyond the edge of the electronic document are displayed in the picture below:

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28



63. **Representative Example #3.** In another example, two contiguous Zones comprise the electronic document. These Zones are shown below:

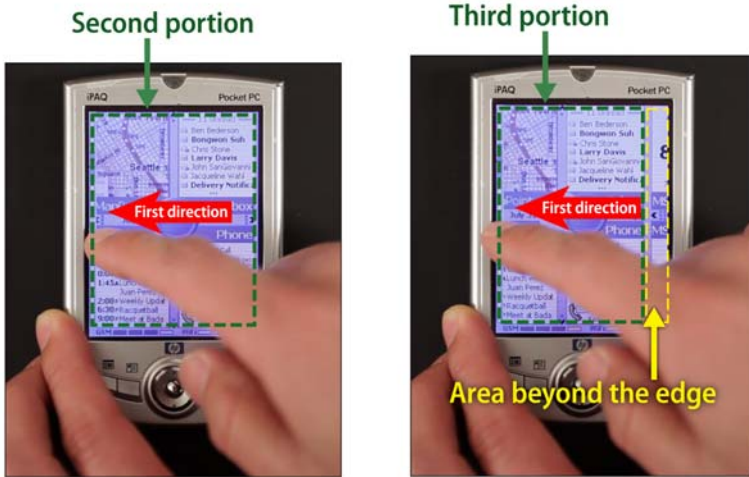
1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28



In this example, as explained above, where two contiguous Zones form a single electronic document, a second portion of the electronic document is now displayed as the user scrolls to the left. If the user continues scrolling to the left, the right edge of the electronic document will be encountered. As the user scrolls past the edge, an area beyond that edge will be displayed. That area will consist of a gray “gutter,” or border, followed by the neighboring Zone, similar to that in representative example #2.



1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28



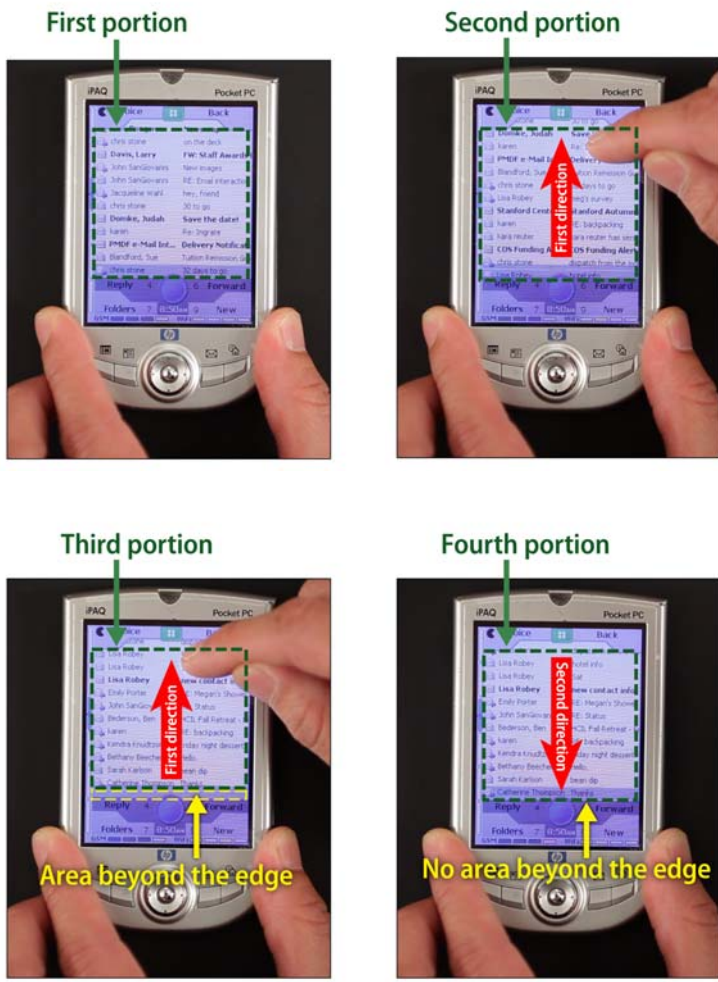
6. Element 5

64. Element 5 of claim 1 recites: “in response to detecting that the object is no longer on or near the touch screen display, translating the electronic document in a second direction until the area beyond the edge of the electronic document is no longer displayed to display a fourth portion of the electronic document, wherein the fourth portion is different from the first portion.”

65. **Representative Example #1.** In one example, in LaunchTile in the email program, if the user lifts her finger after displaying the third portion of the email list, the email list will reverse direction and “snap” back to the bottom edge of the email list, subject to the threshold distance limitation discussed above, such that the area beyond this edge will no longer be displayed. The result will display a fourth portion of the Zone that is different from the first portion.



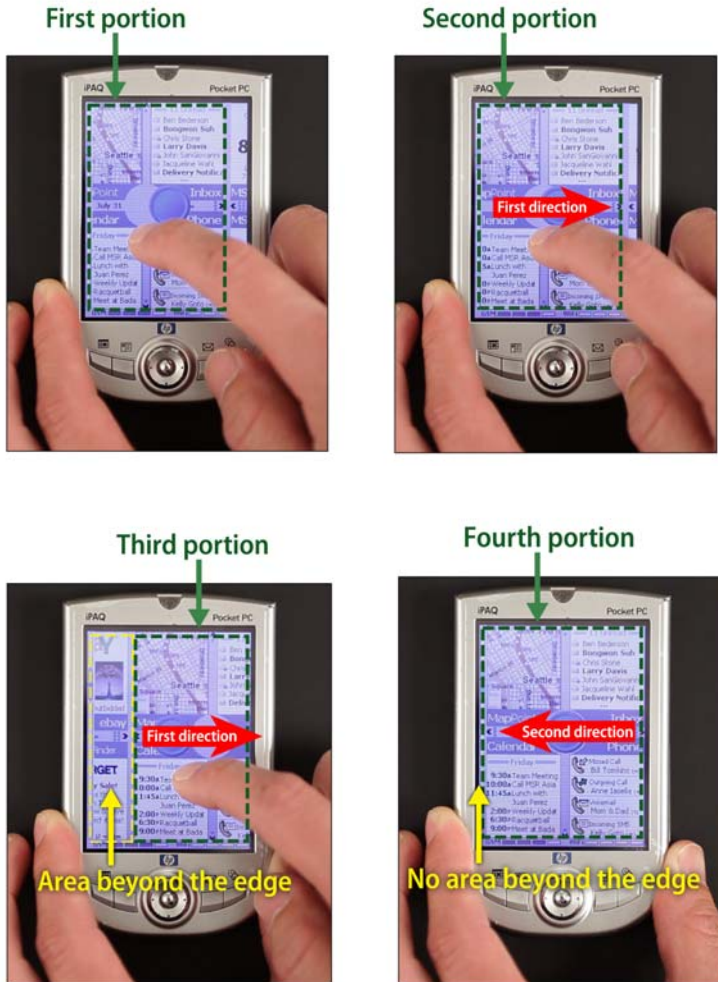
1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28



66. **Representative Example #2.** Similarly, in another example, if the user lifts her finger while in the process of scrolling between Zones, the interface will automatically select a Zone to snap to. If the user has not scrolled past a particular threshold in the direction of the next Zone, the application will snap back to the previous Zone. This snap-back feature will cause the electronic document to be translated in a second direction, which will be opposite to the first direction, until the area beyond the edge of the electronic document can no longer be seen. As a result, a fourth portion of the document is displayed. I note that Dr. Balakrishnan has advocated a claim construction wherein a “portion” of a document can be any area of a document, including the entire area of the document. Balakrishnan Dep. Tr. at 146:15-19.

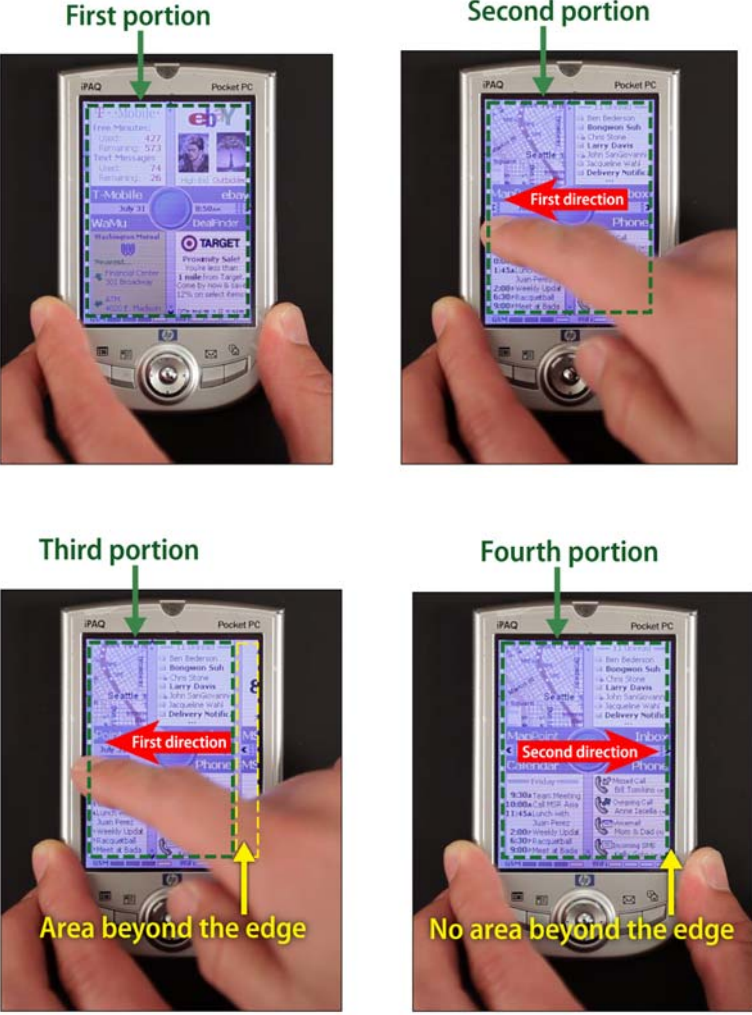
67. The fourth portion of the document is different from the first portion. The sequence below illustrates this:

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28



68. **Representative Example #3.** In another example, in the case of two contiguous Zones being the electronic document, if the user lifts her finger after scrolling some distance beyond the second portion of the electronic document, the electronic document will snap back, translating in the opposite direction until the area beyond the edge of the electronic document is no longer in view. The result will display a fourth portion of the electronic document that is different from the first portion.

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28



69. Based on this analysis, it is my opinion that a touch screen device running LaunchTile discloses each and every element of Claim 1.

B. Claim 2

70. Claim 2 covers: “The computer-implemented method of claim 1, wherein the first portion of the electronic document, the second portion of the electronic document, the third portion of the electronic document, and the fourth portion of the electronic document are displayed at the same magnification.”

71. This claim depends on Claim 1, but adds the additional requirement that all four portions of the electronic document be displayed at the same magnification.

72. As I explained above, a touch screen device running LaunchTile anticipates Claim 1 of the ‘381 Patent. Additionally, as the images in the previous section indicate, all four portions

1 of the electronic document are displayed at the same magnification. Thus, it is my opinion that a  
2 touch screen device running LaunchTile discloses each and every element of Claim 2.

3 C. Claim 3

4 73. Claim 3 covers: “The computer-implemented method of claim 1, wherein the  
5 movement of the object is on the touch screen display.”

6 74. Claim 3, which is dependent on Claim 1, includes the additional requirement that  
7 the movement of the object is on the touch screen display. For the touch screen device on which  
8 LaunchTile executes, the movement of the finger or stylus will only be detected when they are  
9 actually on the touch screen display. Thus, it is my opinion that a touch screen device running  
10 LaunchTile discloses each and every element of Claim 3.

11 D. Claim 4

12 75. Claim 4 covers: “The computer-implemented method of claim 1, wherein the  
13 object is a finger.”

14 76. Claim 4, which is dependent on Claim 1, adds the requirement that the object used  
15 to scroll the document is a finger. For example, using a Compaq iPaq h1900 series model 1950  
16 PocketPC to run LaunchTile, a finger can be used to scroll, including to scroll through Zones.  
17 Thus, it is my opinion that a touch screen device running LaunchTile discloses each and every  
18 element of Claim 4.

19 E. Claim 5

20 77. Claim 5 covers: “The computer-implemented method of claim 1, wherein the first  
21 direction is a vertical direction, a horizontal direction, or a diagonal direction.”

22 78. The LaunchTile email application discussed above involved vertical movement in a  
23 first direction. The scrolling operations between Zones discussed above involved horizontal  
24 movement in a first direction. Thus, it is my opinion that a touch screen device running  
25 LaunchTile discloses each and every element of Claim 5.

26 F. Claim 7

27 79. Claim 7 covers: “The computer-implemented method of claim 1, wherein the  
28 electronic document is a digital image.”

1           80.     Claim 7, which is dependent on Claim 1, adds the requirement that the electronic  
2 document is “a” digital image. I am informed by counsel that in patent claims, the word “a” is  
3 presumed to mean “one or more.”

4           81.     A computing device running LaunchTile discloses an electronic document that  
5 comprises one or more digital images.

6           82.     **Representative Example #1.** For example, the LaunchTile prototype email  
7 application has an electronic document that is at least one or more digital images. In the  
8 prototype email application, the electronic document is the email list. However, because the  
9 email application is only a prototype, each entry in the email list is actually an individual digital  
10 image or .png file, acting as placeholders in order to emulate an operative email application.  
11 Thus, as the email application is currently written in LaunchTile, the electronic document (email  
12 list) is composed of one or more digital images (.png files representing entries in the list).

13           83.     **Representative Examples #2 & #3.** Similarly, a Zone in LaunchTile is  
14 comprised of four tiles, and two contiguous Zones are comprised of eight tiles. Each of these tiles  
15 is displayed as an individual image, and in fact many are .png image files.

16           84.     To the extent the examples discussed above do not anticipate claim 7, it would have  
17 been obvious to one of ordinary skill in the art to modify LaunchTile so that the electronic  
18 document is a single digital image. The user interface features identified above as anticipating  
19 claim 1 of the ‘381 patent operate independently of the nature of the underlying electronic  
20 document. An implementer could employ these same techniques to manipulate *any* document  
21 displayed on the screen, regardless of whether the document is a list of items or a digital image.  
22 Applying these techniques to a digital image would not have presented any unique problems, or  
23 even significant effort. Additionally, because digital images are commonly displayed on  
24 computing devices, one of skill in the art would be motivated to modify LaunchTile so that its user  
25 interface features would operate in the same manner described above when the electronic  
26 document is a single digital image. Thus, it is my opinion that Claim 7 recites an obvious  
27 modification to the functionality contained in LaunchTile and in XNav if LaunchTile or XNav do  
28 not disclose each and every limitation of Claim 7.

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

G. Claim 9

85. Claim 9 covers: “The computer-implemented method of claim 1, wherein the electronic document includes a list of items.”

86. **Representative Example #1.** The electronic document in the LaunchTile email application includes a list of items. For example, as shown in the image below, the electronic document is an inbox comprising a list of emails.



87. **Representative Examples #2 & #3.** Similarly, a Zone (viewed on its own, or viewed as part of an eight-tile area of two contiguous Zones) also includes a list of phone-related events, including missed calls, outgoing calls, voicemail, and incoming text messages. The electronic document shown below (which is half of the electronic document in Representative Example #3) also includes a “Calendar,” which consists of a list of scheduled events.

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28



88. Thus, it is my opinion that a touch screen device running LaunchTile discloses each and every element of Claim 9.

H. Claim 10

89. Claim 10 covers: “The computer-implemented method of claim 1, wherein the second direction is opposite the first direction.”

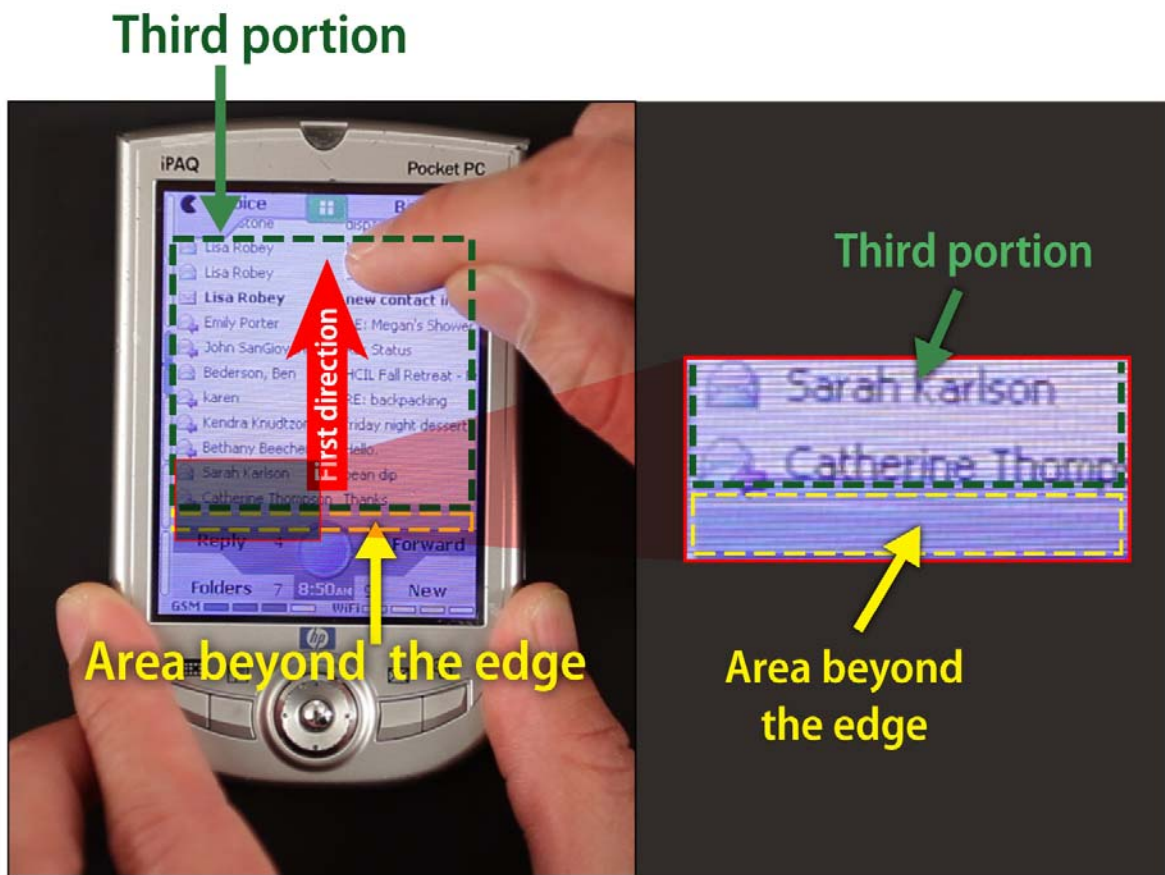
90. When the snap-back effect discussed above occurs after the user lifts her finger, the direction of the snap-back (the second direction) is opposite the direction in which the user was scrolling (the first direction). Thus, it is my opinion that a touch screen device running LaunchTile discloses each and every element of Claim 10.

I. Claim 13

91. Claim 13 covers: “The computer-implemented method of claim 1, wherein the area beyond the edge of the document is black, gray, a solid color, or white.”

92. **Representative Example #1.** In one example, in the email program, when the end of the list of emails is reached, the area beyond the edge of the email list is a solid color:

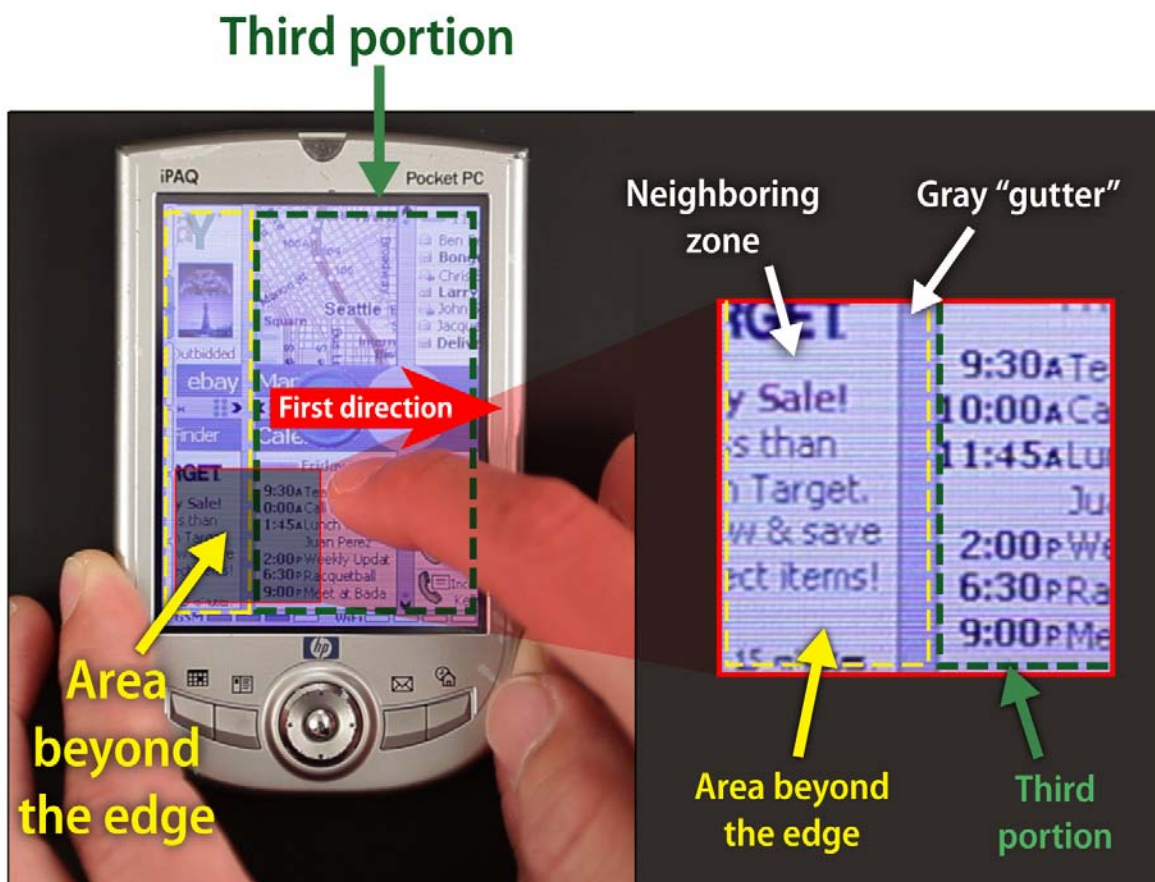
1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28



93. **Representative Examples #2 & #3.** In another example, between each of the Zones displayed in LaunchTile is a solid-colored gray “gutter” area that indicates a separation between the Zones. This gutter area is displayed beyond the edge of the document. Accordingly, the gutter area beyond the edge of the document is a solid-colored gray area. This same area surrounds an eight-tile area of two contiguous Zones and forms a solid-colored gray area beyond the edge of that document.



1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28



94. I note that this solid-colored gray “gutter” area is the first area displayed beyond the edge of the document during the scrolling operation discussed above. Thus, at some point during the scrolling operation, the solid-colored gray area is the only area displayed beyond the edge of the document. The neighboring Zone area beyond this “gutter” will only displayed later, if the user continues to scroll. There is therefore a point in this scrolling operation at which the entire area beyond the edge of the document is displayed as a solid-colored gray area. There is further a point in this scrolling operation where the third portion of the document would, at a pixel level, be smaller than a previously-displayed first portion of the document.

95. For these reasons, it is my opinion that a touch screen device running LaunchTile discloses each and every element of Claim 13.

96. In the event that this limitation was not disclosed explicitly, in my opinion it would be obvious to modify LaunchTile, or any other system, such that the area beyond the edge of the

1 document is black, gray, a solid color, or white. This claim recites an issue of color selection.  
2 Any competent user interface designer understands that solid colors can be, and very frequently  
3 are, used as elements of a display. Solid colors, including black, gray, or white, are common  
4 background colors in user interfaces. Their use in this context would be trivial and would involve  
5 no special effort, skill, or insight.

6 J. Claim 14

7 97. Claim 14 covers: “The computer-implemented method of claim 1, wherein the area  
8 beyond the edge of the document is visually distinct from the document.”

9 98. **Representative Example #1.** In one example, in the email program, the area  
10 beyond the edge of the email list is visually distinct from the document, i.e. the area beyond the  
11 edge is a solid color, whereas the email list contains text and images.

12 99. **Representative Examples #2 & #3.** As discussed above, each of the Zones  
13 displayed in LaunchTile is separated by a solid-colored gray area that indicates a border between  
14 Zones. This gray area is displayed beyond the edge of the Zone and is visually distinct from the  
15 Zone. This area is also displayed as a border of an eight-tile area comprised of two contiguous  
16 Zones. This gray area is displayed beyond the edge of such a document and is visually distinct  
17 from the document.

18 100. Thus, it is my opinion that a touch screen device running LaunchTile discloses each  
19 and every limitation of Claim 14.

20 K. Claim 16

21 101. Claim 16 covers: “The computer-implemented method of claim 1, wherein  
22 changing from translating in the first direction to translating in the second direction until the area  
23 beyond the edge of the document is no longer displayed makes the edge of the document appear to  
24 be elastically attached to an edge of the touch screen display or to an edge displayed on the touch  
25 screen display.”

26 102. **Representative Example #1.** When the email list “snaps” back to align itself with  
27 the bottom edge of the display window, it makes the edge of the document appear to be elastically  
28 attached to the bottom edge of the display window.

1           103.   Representative Examples #2 & #3. Similarly, when the Zones in LaunchTile  
2 snap back to align themselves with the edge of the screen, this snap-back effect is animated in a  
3 way that makes a Zone appear to be elastically attached to the edge of the display. Thus, it is my  
4 opinion that a touch screen device running LaunchTile discloses each and every limitation of  
5 Claim 16.

6           L.       Claim 19

7                   1.       Preamble

8           104. To the extent the preamble is a limitation, the LaunchTile application runs on a  
9 device. In particular, as discussed above, I ran the LaunchTile program on a Compaq iPaq h1900  
10 series model 1950 PocketPC.

11                   2.       Element 1

12           105. Element 1 of claim 19 recites: “a touch screen display.”

13           106. The Compaq iPaq h1900 series model 1950 PocketPC is a device with a touch  
14 screen display, as discussed above. Thus it is my opinion that such a device meets this element of  
15 claim 19.

16                   3.       Element 2

17           107. Element 2 of claim 19 recites: “one or more processors.”

18           108. The Compaq iPaq h1900 series model 1950 PocketPC is a device that has an  
19 Samsung SC32442 processor. See Ex. 14 at p.3 (HP iPaq 1950 Pocket PC QuickSpecs). Thus,  
20 it is my opinion that such a device meets this element of claim 19.

21                   4.       Element 3

22           109. Element 3 of claim 19 recites: “memory.”

23           110. The Compaq iPaq h1900 series model 1950 PocketPC is a device that has 32 MB  
24 of volatile main memory. See Ex. 14 at p.3 (HP iPaq 1950 Pocket PC QuickSpecs). Thus, it is  
25 my opinion that such a device meets this element of claim 19.

26                   5.       Element 4

27  
28

1 111. Element 4 of claim 19 recites: “one or more programs, wherein the one or more  
2 programs are stored in memory and configured to be executed by the one or more processors, the  
3 programs including.”

4 112. A Compaq iPaq h1900 series model 1950 PocketPC with the LaunchTile  
5 application installed on it will, when used, have a program stored in memory and configured to be  
6 executed by the one or more processors. The LaunchTile application can be executed by  
7 navigating to the LaunchTile application in the File Explorer and clicking on the file. Thus, it is  
8 my opinion that a Compaq iPaq h1900 series model 1950 PocketPC with the LaunchTile  
9 application installed on it meets this element of Claim 19.

10 6. Element 5

11 113. Element 5 of claim 19 recites: “instructions for displaying a first portion of an  
12 electronic document.”

13 114. As described above in Section VI.a.3, the LaunchTile application displays a first  
14 portion of an electronic document. Because it performs this function, the LaunchTile application  
15 must also contain instructions for displaying a first portion of an electronic document. Thus, it is  
16 my opinion that a Compaq iPaq h1900 series model 1950 PocketPC with the LaunchTile  
17 application installed on it meets this element of Claim 19.

18 7. Element 6

19 115. Element 6 of claim 19 recites: “instructions for detecting a movement of an object  
20 on or near the touch screen display; instructions for translating the electronic document displayed  
21 on the touch screen display in a first direction to display a second portion of the electronic  
22 document, wherein the second portion is different from the first portion, in response to detecting  
23 the movement.”

24 116. As described above in Section VI.a.4, the LaunchTile application detects a  
25 movement of an object on or near the touch screen display; in response to detecting the movement,  
26 translates the electronic document displayed on the touch screen display in a first direction to  
27 display a second portion of the electronic document, wherein the second portion is different from  
28 the first portion. Because it performs this function, the LaunchTile application must also contain

1 instructions for doing so. Thus, it is my opinion that a Compaq iPaq h1900 series model 1950  
2 PocketPC with the LaunchTile application installed on it meets this element of Claim 19.

3 8. Element 7

4 117. Element 7 of claim 19 recites: “instructions for displaying an area beyond an edge  
5 of the electronic document and displaying a third portion of the electronic document, wherein the  
6 third portion is smaller than the first portion, in response to the edge of the electronic document  
7 being reached while translating the electronic document in the first direction while the object is  
8 still detected on or near the touch screen display.”

9 118. As described above in Section VI.a.5, the LaunchTile application displays an area  
10 beyond the edge of the electronic document (e.g., a grey or multi-colored area) and displays a third  
11 portion of the electronic document, wherein the third portion is smaller than the first portion, in  
12 response to the edge of the electronic document being reached while translating it in the first  
13 direction while the object is still detected on or near the touch screen display. Because it  
14 performs this function, the LaunchTile application must also contain instructions for doing so.  
15 Thus, it is my opinion that a Compaq iPaq h1900 series model 1950 PocketPC with the  
16 LaunchTile application installed on it meets this element of Claim 19.

17 9. Element 8

18 119. Element 8 of claim 19 recites: “instructions for translating the electronic document  
19 in a second direction until the area beyond the edge of the electronic document is no longer  
20 displayed to display a fourth portion of the electronic document, wherein the fourth portion is  
21 different from the first portion, in response to detecting that the object is no longer on or near the  
22 touch screen display.”

23 120. As described above in Section VI.a.6, in response to detecting that the object is no  
24 longer on or near the touch screen display, the LaunchTile application translates the electronic  
25 document in a second direction until the area beyond the edge of the electronic document is no  
26 longer displayed to display a fourth portion of the electronic document that is different from the  
27 first portion. Because it performs this function, the LaunchTile application must also contain  
28

1 instructions for doing so. Thus, it is my opinion that a Compaq iPaq h1900 series model 1950  
2 PocketPC with the LaunchTile application installed on it meets this element of Claim 19.

3 121. In my opinion, a Compaq iPaq h1900 series model 1950 PocketPC with the  
4 LaunchTile application installed on it discloses each and every limitation of Claim 19.

5 M. Claim 20

6 1. Preamble

7 122. The preamble of claim 20 recites: “A computer readable storage medium having  
8 stored therein instructions, which when executed by a device with a touch screen display, cause a  
9 device to.”

10 123. A Compaq iPaq h1900 series model 1950 PocketPC device with the LaunchTile  
11 application installed on it is device containing a computer readable storage medium with  
12 instructions for the LaunchTile application stored therein that cause it to perform the functions  
13 discussed below. Furthermore, this device includes a touch screen display.

14 2. Element 1

15 124. Element 1 of claim 20 recites: “display a first portion of an electronic document”

16 125. As described above, the LaunchTile application displays a first portion of an  
17 electronic document. Because it performs this function, the LaunchTile application must also  
18 contain instructions for displaying a first portion of an electronic document and those instructions  
19 must be stored in a computer readable storage medium. Thus, it is my opinion that a Compaq  
20 iPaq h1900 series model 1950 PocketPC with the LaunchTile application installed on it meets this  
21 element of Claim 20.

22 3. Element 2

23 126. Element 2 of claim 20 recites: “detect a movement of an object on or near the touch  
24 screen display; translate the electronic document displayed on the touch screen display in a first  
25 direction to display a second portion of the electronic document, wherein the second portion is  
26 different from the first portion, in response to detecting the movement.”

27 127. As described above in Section VI.a.4, the LaunchTile application detects a  
28 movement of an object on or near the touch screen display; in response to detecting the movement,

1 translates the electronic document displayed on the touch screen display in a first direction to  
2 display a second portion of the electronic document, wherein the second portion is different from  
3 the first portion. Because it performs this function, the LaunchTile application must also contain  
4 instructions for doing so and those instructions must be stored in a computer readable storage  
5 medium. Thus, it is my opinion that a Compaq iPaq h1900 series model 1950 PocketPC with the  
6 LaunchTile application installed on it meets this element of Claim 20.

7 4. Element 3

8 128. Element 3 of claim 20 recites: “display an area beyond an edge of the electronic  
9 document and display a third portion of the electronic document, wherein the third portion is  
10 smaller than the first portion, if the edge of the electronic document is reached while translating  
11 the electronic document in the first direction while the object is still detected on or near the touch  
12 screen display.”

13 129. As described above in Section VI.a.5, the LaunchTile application displays an area  
14 beyond the edge of the electronic document (e.g., a grey or multi-colored area) and displays a third  
15 portion of the electronic document, wherein the third portion is smaller than the first portion, in  
16 response to the edge of the electronic document being reached while translating it in the first  
17 direction while the object is still detected on or near the touch screen display. Because it  
18 performs this function, the LaunchTile application must also contain instructions for doing so and  
19 those instructions must be stored in a computer readable storage medium. Thus, it is my opinion  
20 that a Compaq iPaq h1900 series model 1950 PocketPC with the LaunchTile application installed  
21 on it meets this element of Claim 20.

22 5. Element 4

23 130. Element 4 of claim 20 recites: “translate the electronic document in a second  
24 direction until the area beyond the edge of the electronic document is no longer displayed to  
25 display a fourth portion of the electronic document, wherein the fourth portion is different from  
26 the first portion, in response to detecting that the object is no longer on or near the touch screen  
27 display.”

28

1           131. As described above in Section VI.a.6, in response to detecting that the object is no  
2 longer on or near the touch screen display, the LaunchTile application translates the electronic  
3 document in a second direction until the area beyond the edge of the electronic document is no  
4 longer displayed to display a fourth portion of the electronic document that is different from the  
5 first portion. Because it performs this function, the LaunchTile application must also contain  
6 instructions for doing so and those instructions must be stored in a computer readable storage  
7 medium. Thus, it is my opinion that a Compaq iPaq h1900 series model 1950 PocketPC with the  
8 LaunchTile application installed on it meets this element of Claim 20.

9           132. Accordingly, it is my opinion that a Compaq iPaq h1900 series model 1950  
10 PocketPC with the LaunchTile application installed on it discloses each and every limitation of  
11 Claim 20.

12 **VIII. OBVIOUSNESS CONSIDERATIONS**

13           133. I understand from counsel that the combination of familiar elements according to  
14 known methods is likely to be obvious when it does no more than yield predictable results. I  
15 likewise understand from counsel that if a technique is known to have been used to improve on a  
16 particular device, and a person of ordinary skill would recognize that this same technique would  
17 improve similar devices in the same way, using the technique is obvious, unless its actual  
18 application and implementation is outside the abilities of a person of ordinary skill in the art.

19           134. In my opinion, the asserted claims of the '381 patent recite a combination of prior  
20 art elements. As I explain below, this combination of known elements was obvious to try in light  
21 of prior work in the area of user interface design, including work on animation and “physics”-  
22 based metaphors in user interfaces. (Indeed, as described above, this combination of known  
23 elements was in fact implemented in the LaunchTile and XNav systems to provide a user interface  
24 with animated “physics”-based feedback for certain operations.) The idea of a user interface with  
25 animated “physics”-based feedback was not new in 2007. Each of these techniques had already  
26 been used alone or in combination to solve problems relating to movement and alignment. In my  
27 opinion, the combination of these elements is essentially all that is required to practice the asserted  
28 claims, as follows.



1           135. For several decades, the concepts of using physics-based metaphors (for example,  
2 magnetism, gravity, or friction) in human computer interaction have been known and discussed  
3 widely in the field of user interface design and computer graphics. Many papers discuss the use of  
4 “physics” in user interface design to make human-computer interactions seem more realistic to a  
5 user. These physics-based metaphors tap into a user’s pre-existing knowledge regarding the  
6 physical world, thereby making the user interface feel immediately familiar and comfortable. I  
7 note that Apple’s own publications from the early 1990s on user interface design discussed the  
8 utility of “physics” as a user interface metaphor. See, e.g., Thomas D. Erikson, *Working With*  
9 *Interface Metaphors*, in Brenda Laurel, ed., *The Art of Human-Computer User Interface Design*  
10 (Addison Wesley 1990), at 65-73. As this publication notes:

11           [O]ne particularly useful approach is to focus on the user problems you've  
12 identified and look for real-world events, objects, or institutions that embody  
13 some of the characteristics that users find difficult to understand. These make  
14 good candidates for new interface metaphors. For example, what are some real-  
15 world things that exhibit directionality? Rivers flow in one direction; TV images  
16 are transmitted from a broadcaster to a receiver; newspapers are mailed from a  
17 publisher to subscribers; forces like gravity and magnetism have direction.  
18 *Id.* at 70.

19 Other papers from this period provide specific examples of “physics”-based metaphors, such as  
20 simple collision “physics” in which objects bump into and displace each other. See, for example,  
21 George Robertson, Mary Czerwinski, Kevin Larson, Daniel C. Robbins, David Thiel, and Maarten  
22 van Dantzich, *Data Mountain: Using Spatial Memory for Document Management* (UIST 1998) at  
23 153-162. In this metaphor, multiple web pages displayed at once on a screen in a three-  
24 dimensional space could be dragged and collided to “transitively propagate displacement” to other  
25 pages. These collisions occurred in real-time so that the user “sees what state will result when the  
26 drag is terminated.” Because the displayed web page objects collide to displace each other, “you  
27 cannot move a page and leave two pages in the same location,” meaning that “the pages never get  
28 fully obscured.” This approach is a direct application of simple collision “physics” to a user  
interface.

136. As an additional example, computer-aided design (CAD) programs have used  
physics-based metaphors for attractive forces, such as gravity or magnetism, for many years in

1 user interfaces. CAD programs often include so-called “grid gravity” mechanisms for object  
2 alignment. In these systems, the user interface is often organized into a Cartesian grid; each  
3 element of the grid is imbued with attractive properties akin to a gravitational or magnetic force,  
4 such that when an object on the user interface comes within some small distance of a point on the  
5 grid, that object will “snap” to the grid. This system aids the user in aligning objects with the  
6 points or lines of the grid, or aligning edges of objects. These concepts are not limited to a  
7 Cartesian grid and can be used with vertices, edges, or other geometric features to align objects of  
8 arbitrary complexity, either with a grid or with each other. These snapping techniques have  
9 obvious utility for CAD programs and have therefore been an element of CAD programs for  
10 decades. See Mark Gross, *Grids in Design and CAD*, at 7 (ACADIA 1991, Los Angeles) (noting  
11 that “[g]rid snap behavior, or ‘grid gravity,’ is a feature in almost every drawing and drafting  
12 program”). Grid gravity mechanisms have obvious utility for many other user interfaces, in  
13 particular where it is advantageous to enable precise placement and alignment of user interface  
14 elements.

15 137. Among the many publications discussing the advantages “physics”-based  
16 metaphors offer in general in user interface design is Benjamin Bederson & James D. Hollan,  
17 *Pad++: A Zooming Graphical Interface for Exploring Alternate Interface Physics* (Association of  
18 Computing Machinery, 1994). Bederson and Hollan teach several advantages of physics-based  
19 metaphors over other popular user interface metaphors. For example, when a UI metaphor is no  
20 longer useful or prevalent, as is common in the rapidly developing world of computer technology,  
21 a whole series of code based on that metaphor may need to be scrapped. For example, Bederson  
22 and Hollan note that “menu” and “desktop” metaphors frequently evolve in a manner that may  
23 cause prior code bases to be jettisoned. However, when the metaphor is “physics,” it is unlikely to  
24 ever have to be scrapped, as the laws of physics are ubiquitous and unchanging. Another known  
25 advantage to physics-based metaphors is the reduced learning curve. One cost that comes with  
26 any new UI metaphor “is that designers can no longer rely on users’ familiarity with the [older]  
27 metaphorical reference[s] and this has learnability consequences.” (p.25). However, these  
28 learnability problems are diminished when the metaphor is based on physics, as “empirical

1 knowability naturally follows from a physics perspective.” (p.25). A person of ordinary skill,  
2 having familiarity with publications such as Bederson and Hollan, would understand that users  
3 quickly grasp the design of interfaces that mimic attributes of physical systems, since these  
4 interfaces build on the users’ intuition and their experiences with the physical world.

5 138. Assorted “physics” metaphors and their benefits for user interface design are  
6 discussed in Bay Wei Chang and David Ungar, *Animation: From Cartoons To The User Interface*,  
7 Sun Microsystems Laboratories Inc. Technical Report No. SMLI-TR-95-33 (March 1995). As an  
8 example, Chang and Ungar discuss techniques used in the Self user interface to replicate the  
9 “physics” of real-world interactions. These include collision “physics” metaphors in which an  
10 object “reacts to the contact with a small wiggling jolt” (p. 7 & Fig. 4), spring “physics”  
11 metaphors in which an object that is about to move “anticipates that move with small, quick  
12 contrary movement” similar to “the Coyote in the Road Runner cartoons, springing back onto its  
13 rear leg before dashing off after the Road Runner” (p. 9 & Fig. 7), acceleration and deceleration  
14 “physics” used on moving objects to begin motion slowly and end motion slowly, “giv[ing] a  
15 feeling of weight to the [object] and physicality to the movement” (p.10 & Fig. 8), and inertial  
16 “physics” that cause objects that cause “[o]bjects coming to a stop [to] wiggle at the end of their  
17 motion, as if reacting to a small spring at the end of their travel” (p.11 & Fig. 10). Each of these  
18 metaphors had long been known in the cartoon animation realm; Chang and Ungar merely  
19 recognize that these same principles of animated “physics” are useful as applied to user interface  
20 design.

21 139. Apple’s expert, Dr. Balakrishnan, has observed the same advantages to the use of  
22 “physics” in the user interface in his publications. For example, Dr. Balakrishnan addressed this  
23 subject in *Keepin’ It Real: Pushing the Desktop Metaphor with Physics, Piles and the Pen*,  
24 Proceedings of the ACM (2006 Conference on Human Factors in Computing Systems (CHI) at p.  
25 1283-1292). In this paper, Dr. Balakrishnan appealed to the use of physical systems in user  
26 interfaces, and in particular took the model of a desktop that could have objects piled on top of  
27 each other, rather than filed in two-dimensional folders, and then modeled the movement of these  
28 objects using “a variety of interaction and visualization techniques” that are “influenced by

1 friction and mass, *much like we would manipulate lightweight objects in the real world.*” (*Id.* at  
2 Abstract (emphasis added).) The paper echoes earlier publications lauding the utility of “physics”  
3 metaphors in user interface design:

4       Physics-based movement of objects is simulated with rigid body dynamics,  
5       collision detection, and frictional forces. When objects collide they bump against  
6       and displace one another in a physically realistic fashion. A simulated  
7       gravitational force keeps objects on the ground. The introduction of physics  
8       simulation to a desktop environment makes the desktop more lively, and offers  
9       increased degrees-of-freedom for potentially more expressiveness than a  
10       traditional GUI desktop where icons are kept axis- aligned and have little  
11       resemblance to their physical counterparts. We believe that this physical  
12       simulation has a positive and subtle effect on object placement and appearance.  
13       For example, if a few documents are casually tossed to a corner they will collide  
14       and begin to accumulate. Their messy appearance subtly affords an unorganized  
15       state, without the user having to explicitly specify it.

16 *Id.* at 1286.

17       140. In addition to physics-based metaphors, the use of animated transitions in user  
18       interface design has long been a well-known concept in the field, included animated translations.  
19       Chang and Ungar, cited above, discuss this history and these issues at length in *Animation: From*  
20       *Cartoons To The User Interface*, Sun Microsystems Laboratories Inc. Technical Report No.  
21       SMLI-TR-95-33 (March 1995). As Chang and Ungar explained, techniques drawn from cartoon  
22       animation replace sudden changes to a computer’s display with smooth animated transitions.  
23       These animated transitions are beneficial for users and offer both cognitive and affective benefits.  
24       Animation eliminates the need for a user to puzzle over how and why user interface elements  
25       changed in response to object movement or translation.

26       141. A person of ordinary skill in the art would appreciate that and the combination of  
27       animation and “physics” metaphors is a predictable and in fact common combination, particularly  
28       for animated physics-based metaphors such as gravity, magnetism, spring forces, elastic forces, or  
29       others (see Chang and Ungar for a more complete list). Each of these techniques were known  
30       solutions to problems in user interface design. In the ‘381 patent, these known techniques are  
31       combined as part of a metaphor mimicking the movements of physical objects impacted by  
32       attractive forces (e.g., magnetism or gravity) or reactive forces (e.g., an elastic band or spring

1 contracting, or a ball bouncing off a solid surface). There is nothing novel or surprising about  
2 using any of these metaphors to signal and correct a user's over-scrolling or under-scrolling  
3 operation. In fact, as described above and in Exhibits 2 - 3 hereto, prior art systems such as  
4 LaunchTile and XNav actually employed such a technique.

5 142. It would be natural to one of skill in the art to employ a physics-based effect  
6 mimicking attractive or reactive forces when designing aspects of a touch-screen user interface.  
7 Such a mechanism offers known solutions to alignment problems for object edges, including  
8 misalignment due to a user's over-scrolling or under-scrolling operation or other form of  
9 movement. A mechanism of this sort is useful not only for aligning documents or document  
10 portions that have been scrolled beyond the edge of the document currently being examined, but  
11 also for correcting alignment errors involving an electronic document or portions thereof. A  
12 person of ordinary skill in the art would immediately appreciate that these alignment mechanisms  
13 are useful to prevent wasteful use of screen space on a mobile device's small screen; absent such a  
14 snap-back effect, the screen's small display may be used inefficiently by displaying an area  
15 beyond the edge of a document being examined due to an imprecise scrolling operation. The use  
16 of an animated metaphor to re-align elements of the display to maximize the visible portion of the  
17 document being examined would have been natural to a person of ordinary skill in the art,  
18 including metaphors based on physical properties such as attractive forces and reactive forces.

19 143. The techniques described above were well within the competence of a person of  
20 ordinary skill in 2007 (and for many years prior), on their own or in combination. I note that the  
21 '381 patent itself appears to presume that a person of ordinary skill would know how to implement  
22 each of the individual techniques that the patent describes, such as document translation,  
23 animation, and implementing an animated physics-based metaphor for document translation (e.g.,  
24 a "rubber band" metaphor mimicking an elastic force). For example, the patent does not contain  
25 source code or even high-level pseudo-code for implementing this functionality. Algorithms for  
26 implementing this functionality are not described in the specification or disclosed in the patent's  
27 high-level flow diagrams. Instead, the patent's high-level flow diagrams presume that techniques  
28 for implementing the functionality disclosed in those high-level flow diagram are already known

1 to persons of skill. In my opinion this is a fair assumption, because techniques for implementing  
2 the claimed functionally were already well-known in the art and within the grasp of a person of  
3 ordinary skill.

4 144. I understand from counsel that secondary considerations that could prove instructive  
5 on the issue of obviousness include commercial success, failure of others, and long felt but  
6 unresolved needs. I am not aware of any evidence that ties the success of any product, including  
7 any Apple product, to any particular claims of the '381 patent. I am also unaware of any  
8 evidence that others in the field tried, but failed, to formulate the combination of prior art elements  
9 recited in the '381 patent's claims. To the contrary, others in the field (for example, Dr.  
10 Bederson's team on the LaunchTile and XNav projects) did in fact create systems that disclose  
11 each and every limitation recited in the '381 patent claims. Finally, with regard to long felt but  
12 unresolved needs, in my opinion there was no long felt need for the combination of known  
13 techniques described in the '381 patent claims. The problem of moving objects "beyond the  
14 edge" is as old as computer graphics, and many classical solutions exist (e.g., clipping, wrap-  
15 around, etc.). The specific problem of preventing a user from moving an electronic document  
16 beyond the edge of its window treated in the patent also has a number of obvious solutions. One  
17 is to prevent the document from moving beyond the edge by ignoring further requests for any such  
18 movement. This can be done with or without visual feedback indicating that these requests will  
19 be ignored. The patent describes one technique for visual feedback, which is to allow the user to  
20 temporarily have the illusion of scrolling or dragging the edge of the document beyond the edge of  
21 the window, but then immediately animating a "snap" back to a state where the document is not  
22 permitted to move beyond the edge. I am aware of no long-felt, unresolved need for this  
23 particular form of visual feedback.

24 145. Should Apple take a position on the considerations discussed above, or present  
25 evidence relating to any of these topics, I reserve my right to supplement or amend my opinions  
26 and respond to Apple's assertions as appropriate.

27 IX. MATERIALITY OF THE PRIOR ART

28

1 146. I have been asked to consider whether the prior art references discussed in Exhibits 2  
2 - 5 are cumulative of art that was cited during prosecution of the '381 patent.

3 147. I understand from counsel that a reference is not cumulative of other cited art if it  
4 includes limitations or combinations of limitations that were absent from the prior art considered  
5 by the Examiner. I am also informed that a reference that includes a more complete combination  
6 of all the relevant features, even if those features were in front of the Examiner, is not cumulative.

7 148. During prosecution of the '381 patent, the applicants represented to the patent office  
8 that four references were most closely related to the subject matter of the claims: (1) Zimmerman  
9 et al., U.S. Patent No. 6,690,387, (2) Kwatinetz et al., U.S. Patent No. 5,495,566, (3) Pallakoff,  
10 U.S. Patent App. Pub. 205/0012723, and (4) Miller, "PersonalJava Application Environment."  
11 Applicants asserted that this art did not contain any disclosure for multiple limitations in the  
12 claims, including any disclosure of a method wherein the second direction is opposite the first  
13 direction (claim 10). *See* April 30, 2008 Supplemental Accelerated Examination Support  
14 Document at 9, 18. The patent examiner concluded that the cited prior art "does not teach in  
15 response to an edge of the electronic document being reached while translating the electronic  
16 document in the first direction while the object is still detected on or near the touch screen display:  
17 displaying an area beyond the edge of the document, and displaying a third portion of the  
18 electronic document, wherein the third portion, is smaller than the first portion; and in response to  
19 detecting that the object is no longer detected on or near the touch screen display, translating the  
20 electronic document in a second direction until the area beyond the edge of the electronic  
21 document is no longer displayed to display a fourth portion of the electronic document, wherein  
22 the fourth portion is different from the first portion." October 29, 2008 Examiner's Amendment  
23 at 4-5.

24 149. In my opinion, the prior art references discussed in Exhibits 2 - 5 are not cumulative  
25 of the references that were presented to the Examiner during prosecution of the '381 patent. For  
26 example, the prior art references discussed in Exhibits 2 - 5 disclose limitations that the applicants  
27 represented were not present in the references that the applicants identified as most closely related  
28 to the subject matter of the claims, such as a method wherein translation in a second direction is

1 opposite the first direction (claim 10). *See* Exhibits 2 - 5. Likewise, the prior art references  
2 discussed in Exhibits 2 - 5 disclose a method of translation that involves the display of a first  
3 portion, second portion, third portion and fourth portion of an electronic document. *Id.* Further,  
4 as explained in Exhibits 2 - 5, in my opinion the prior art references discussed in Exhibits 2 - 5  
5 would teach and inspire one of ordinary skill in the art to perform the limitations identified by the  
6 patent examiner as missing from the cited art. *Compare* Exhibits 2 - 5 to October 29, 2008  
7 Examiner's Amendment at 4-5. In light of the fact that the examiner indicated that these  
8 limitations were the only ones the examiner said were missing from the art, the prior art references  
9 discussed in Exhibits 2 - 5, would have, alone or in combination with one or more of the cited  
10 prior art references, rendered the claims unpatentable.

11           150. Moreover, it is my opinion that the prior art references discussed in Exhibits 2 - 5  
12 are not cumulative of art cited during the reexamination of the '381 patent. Specifically, the  
13 examiner stated that the claims were patentable over the prior art cited during reexamination  
14 because "[t]he prior art does not teach or fairly address the invention as recited in independent  
15 claims 1, 19, and 20 of U.S. Patent No. 7,469,381 82. Specifically, the prior art references of  
16 Glimpse, Inside Out, Robbins, and Zimmerman fail to disclose 'in response to detecting that the  
17 object is no longer on or near the touch screen display, translating the electronic document in a  
18 second direction until the area beyond the edge of the electronic document is no longer displayed  
19 to display a fourth portion of the electronic document, wherein the fourth portion is different from  
20 the first portion' as recited in claims 1, 19, and 20." '381 reexamination file history, Notice of  
21 Intent to Issue Ex Parte Reexamination Certificate (January 13, 2001) at 2. As already discussed  
22 above, the prior art references discussed in Exhibits 2 - 5 expressly disclose these limitations.  
23 Therefore, in my opinion, the prior art references discussed in Exhibits 2 - 5 is not cumulative of  
24 the art cited during reexamination of the '381 patent.

25 X.     OTHER COMMENTS

26           151. The opinions expressed in this declaration are my preliminary opinions based on my  
27 review to date of the evidence produced at this early stage of the case. My opinions are subject to  
28 change based on additional opinions that Apple's experts may present and information I may



1 receive in the future. I reserve my right to amend or update my opinions as appropriate in  
2 response to any future developments regarding claim construction, including any court order on  
3 claim construction. With this in mind, based on the analysis I have conducted and for the reasons  
4 set forth above, I have preliminarily reached the conclusions and opinions in this declaration.

5           152. At a hearing or at trial I may use as exhibits various documents produced in this case  
6 that refer or relate to the matters discussed in this report. I have not yet selected the particular  
7 exhibits that might be used. I may also rely on visual aids and may rely on analogies concerning  
8 elements of the '381 patent, the accused products, the prior art referenced in this report, or any  
9 related technologies. In addition, I may create or assist in the creation of certain demonstrative  
10 evidence to assist me in testifying, and I reserve the right to do so, such as demonstrations of  
11 devices and software to further support the positions in this report.

12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

I declare under penalty of perjury that the foregoing is true and correct. Executed in Providence, Rhode Island on 8/20/, 2011.

By   
\_\_\_\_\_  
Andries Van Dam