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UNITED STATES DISTRICT COURT

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NORTHERN DISTRICT OF CALIFORNIA

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SAN JOSE DIVISION

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12 APPLE INC., a California corporation,

Case No.   11-cv-01846-LHK

13   Plaintiff,

**EXPERT REPORT OF RAVIN
BALAKRISHNAN, PH.D.
REGARDING INFRINGEMENT
OF U.S. PATENT NO. 7,469,381**

14   v.

15 SAMSUNG ELECTRONICS CO., LTD., A
Korean business entity; SAMSUNG

16 ELECTRONICS AMERICA, INC., a New York
corporation; SAMSUNG

17 TELECOMMUNICATIONS AMERICA, LLC, a
Delaware limited liability company,

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Defendants.

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21 **CONFIDENTIAL – CONTAINS MATERIAL DESIGNATED AS HIGHLY
CONFIDENTIAL – ATTORNEYS' EYES ONLY PURSUANT
TO A PROTECTIVE ORDER**

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I. INTRODUCTION

1. I, Ravin Balakrishnan, Ph.D., have been asked by counsel for Apple Inc. ("Apple") to provide an opinion in the above-captioned case. I understand that Apple has alleged that Defendants Samsung Electronics Co. Ltd., Samsung Electronics America, Inc., and Samsung Telecommunications America, LLC (collectively "Samsung") have infringed various patents assigned to Apple. I have been asked to provide opinions as to whether Samsung has infringed United States Patent No. 7,469,381 ("the'381 patent"). My opinions as to the '381 patent are set forth below in this report and in the accompanying exhibits.

2. I submit this expert report in compliance with Federal Rule of Civil Procedure 26(a)(2). I reserve the right to supplement or amend this report pursuant to Rule 26(e) and as otherwise provided if additional data or other information that affects my opinions becomes available. I expect to testify at trial regarding the matters expressed in this report and any supplemental reports that I may prepare for this litigation. I also may prepare and rely on audiovisual aids to demonstrate various aspects of my testimony at trial. I also expect to testify with respect to any matters addressed by any expert testifying on behalf of Samsung, if asked to do so.

3. I am being compensated at my standard consulting rate of $430 per hour for my work in connection with this action. I am separately being reimbursed for any out-of-pocket expenses. My compensation is not based in any way on the outcome of the litigation or the nature of the opinions that I express.

II. QUALIFICATIONS

4. Here, I provide a brief summary of my qualifications. My qualifications are stated more fully in my curriculum vitae, which is attached to this report as Exhibit 1.

5. I earned my B.Sc. (1st Class Honours) degree in computer science from the University of New Brunswick, Canada, in May 1993. Subsequently, I received my M.Sc. and Ph.D. degrees in computer science from the University of Toronto, Canada, in January 1997 and February 2001, respectively.

1   60.   Additional Samsung documents show that Samsung continued its analysis of

2   Apple and its examination and comparison of Apple products, including the iPhone, iPad, and

3   iPad 2, throughout 2010 and 2011. (*See* SAMNDCA00203811-3879; SAMNDCA00203880-

4   4010; SAMNDCA00229399-9409; SAMNDCA00229449-9451; SAMNDCA00525347-5349;

5   SAMNDCA00525353-5356; SAMNDCA00525362; SAMNDCA10244357-4412;

6   SAMNDCA10247283-7372; SAMNDCA10252803-2841; SAMNDCA10988469-88504;

7   SAMNDCA10989107-9179; SAMNDCA10989363-9379; SAMNDCA10989840-9941;

8   SAMNDCA10990627-0713; SAMNDCA10992025-2057; SAMNDCA10992072-2131;

9   SAMNDCA10993206-3226; SAMNDCA10997825-7879; SAMNDCA10998016-8035;

10 SAMNDCA11289451-9473; and SAMNDCA11313301-3303; *see* select translations in

11 Translations App'x.)

12   **E.   Samsung's Knowledge of the '381 Patent**

13   61.   I understand that Samsung knew of the '381 patent by no later than August 27,

14 2010. On that day, Chip Lutton, counsel for Apple, sent an email to K.J. Kim, counsel for

15 Samsung, that attached two presentations that identified the '381 patent and provided an overview

16 of its features. (*See* APLNDC00001101-1102 (email), APLNDC00001103-1123 (presentation

17 identifying '381 patent), and APLNDC00001126-1192 ('381 overview at (1152-1153).))

18   **F.   Samsung's Infringement of Claim 1 of the '381 Patent**

19   62.   **Claim 1.** Claim 1 of the '381 patent recites:

20   A computer-implemented method, comprising:

21   [a] at a device with a touch screen display:

22   [b] displaying a first portion of an electronic document;

23   [c] detecting a movement of an object on or near the touch screen
24   display; in response to detecting the movement, translating the
            electronic document displayed on the touch screen display in a first
            direction to display a second portion of the electronic document,
25   wherein the second portion is different from the first portion;

26   [d] in response to an edge of the electronic document being reached
27   while translating the electronic document in the first direction while
            the object is still detected on or near the touch screen display:
28   displaying an area beyond the edge of the document, and displaying

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a third portion of the electronic document, wherein the third portion
is smaller than the first portion; and

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[e] 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

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document is no longer displayed to display a fourth portion of the
electronic document, wherein the fourth portion is different from

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the first portion.

6   63.   In my opinion, the ordinary and intended use of the Accused Products (Gallery)

7 infringes independent claim 1 of the '381 patent. As shown in the exemplary infringement claim

8 chart attached hereto as Exhibit 3, which is incorporated by reference, and for the reasons

9 discussed below, the ordinary and intended use of these devices infringes claim 1 of the '381

10 patent.

11   64.   **Claim 1, Preamble: "A computer-implemented method, comprising:"**

12   65.   While I understand that the question of whether this preamble is limiting is a legal

13 matter, for the purposes of this report, I have assumed that it must be met.

14   66.   The ordinary and intended use of the Accused Products (Gallery) meets the

15 preamble of claim 1. This is because these Samsung devices are mobile computing devices with

16 processors that run the Android software platform, and that implement a number of methods of

17 displaying electronic documents on their screens.

18   67.   For example, as Samsung describes its own products, they are mobile computing

19 devices with the following features:

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- Captivate: "1 GHz, Cortex A8 Hummingbird Processor" that uses
"Android 2.3, Gingerbread." (APLNDC-Y0000066835);

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- Vibrant: "1 GHz Cortex A8 Hummingbird Application Processor"
that uses "Android 2.2, Froyo." (APLNDC-Y0000066798);

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23
- Exhibit 4G: "1-GHz Hummingbird" processor that uses "Android
2.3, Gingerbread OS." (APLNDC-Y0000066850); and

24
- Galaxy Tab 10.1: "1 Ghz Dual Core Nvidia Tegra2 Processor" that
uses "Android 3.2, Honeycomb." (APLNDC-Y0000066820-821.)

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68.   While the accused Samsung mobile phones such as the Captivate, Vibrant, and

27 Exhibit 4G phone are often referred to as smartphones, this is analogous to saying that these

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1   devices are hand held computers. These devices employ processors similar to those used in

2   laptop computers, and implement software that performs functions typically performed on a

3   computer, such as displaying electronic documents on the screens of those devices. In addition,

4   the "Tab" in Galaxy Tab and Galaxy Tab 10.1 is an abbreviation for "tablet" computer. The

5   Galaxy Tab and Galaxy Tab 10.1 also implement software that displays electronic documents on

6   their screens. Therefore, the ordinary and intended use of these Samsung devices meets the

7   preamble of claim 1.

8   69.   **Claim 1, Element [a]: "at a device with a touch screen display:"**

9   70.   Based upon my personal observation, all of the accused Samsung devices have

10 touch screen displays. By way of example, the user manual for the Exhibit 4G phone confirms

11 that the Exhibit 4G phone is a phone, or device, with a touch screen display:

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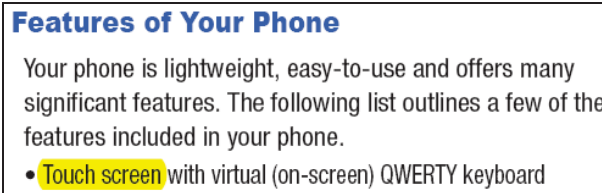
15 (APLNDC-Y0000066320.)

16   71.   Each of the other Accused Products (Gallery) is also a device with a touch screen

17 display. (*See, e.g.,* Ex. 3.) It is my opinion that this claim limitation is satisfied.

18   72.   **Claim 1, Element [b]: "displaying a first portion of an electronic document."**

19   73.   The ordinary and intended use of all the Accused Products (Gallery) meets this

20 claim limitation. Each of these Samsung devices includes an application called "Gallery" that

21 allows for the display of electronic documents, or more specifically, photographs, on the touch

22 screen display of the device. By way of example, the "Gallery" application icon on the Exhibit

23 4G phone is depicted below, circled in red.

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28 (Ex. V5.)

74.   An image being viewed on these Samsung devices may be too large to be seen in its entirety, or may be magnified, or zoomed in on, such that the entire image cannot be seen all at once. When this occurs, a user will see only portions of the image, and will need to scroll or translate the image to view the remainder. Accordingly, these Samsung devices can display a first portion of an electronic document, such as a digital photograph. By way of example, the Exhibit 4G phone is capable of displaying a first portion of an electronic document, as depicted below.

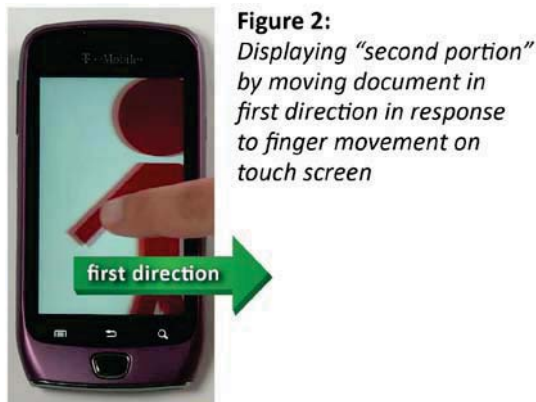Figure 1:
Displaying "first portion"
of electronic document

(Ex. 3.)

75.   Each of the other Accused Products (Gallery) can also display a first portion of an electronic document, as demonstrated in Exhibits 3, V1, V3, V5, and V8. It is my opinion that the ordinary and intended use of all these Samsung devices meets this claim limitation.

76.   **Claim 1, Element [c]: "detecting a movement of an object on or near the touch screen display; in response to detecting the movement, translating the electronic document displayed on the touch screen display in a first direction to display a second portion of the electronic document, wherein the second portion is different from the first portion;"**

77.   The ordinary and intended use of all the Accused Products (Gallery) meets this claim limitation. When a user is viewing a photograph in the Gallery application of these devices, and places a finger on the touch sensitive screen and moves it, the Samsung devices detect that movement, and translate the electronic document, or in this case, the photograph, in the same direction, resulting in the display of another portion of the photograph which is different

from the first portion. By way of example, when running the Gallery application, the Exhibit 4G

phone is capable of detecting the movement of a finger on its touch screen, and in response,

scrolling the photograph in the same direction, thus displaying a second, different portion of the

photograph, as depicted below.

Figure 2:
Displaying "second portion" by moving document in first direction in response to finger movement on touch screen

first direction

(Ex. 3.)

78.   The source code for the Gallery application on the Exhibit 4G phone confirms what I experienced while using this device. The detection of a user's finger and translation of the electronic document are performed in the following source code modules: RenderView.java, GLSurfaceView.java, GridLayer.java, and GridInputProcessor.java. (SAMNDCA-C000007890-7999.) As noted above, the Exhibit 4G phone runs Android 2.3. Based on my inspection of Samsung source code for each major release of Android running on Samsung phones accused of infringing the claims of the '381 patent, similar code for devices running Android 2.2 can be found, for example, at SAMNDCA-C000008045 - 8180. Similar source code for devices running Android 2.1 can be found, for example, at SAMNDCA-C000007702-7746.

79.   Each of the other Accused Products (Gallery) can also detect the movement of a finger on their touch screens, and in response, scroll a photograph in the direction of the finger movement, displaying a second, different portion of the photograph, as demonstrated in Exhibits 3, V1, V3, V5, and V8. It is my opinion that the ordinary and intended use of all these Samsung devices meets this claim limitation.

1   80.   To the extent that this limitation is not met literally, in my opinion it is met under

2   the doctrine of equivalents because the Accused Products (Gallery) are insubstantially different

3   from the device as recited in claim 1.

4   81.   In particular, the devices with touch screen displays perform substantially the same

5   function of translating an electronic document in a first direction to display a second portion of

6   the electronic document, substantially the same way by displaying the movement of an electronic

7   document to display another portion of the electronic document, to achieve substantially the same

8   result of showing a second portion of the electronic document following movement in a direction.

9   82.   Moreover, translating a document in a first direction based on the movement of a

10 human finger with minor irregularity is not substantially different from doing so based on an

11 absolutely precise movement. Translating a document in a first direction based on the movement

12 of a human finger operates to perform substantially the same function (translating the document),

13 in substantially the same way (by detecting the movement of an object), to obtain substantially

14 the same result (translation of a document in a first direction) as translating based on the

15 movement of an object with absolute precision.

16 83.   **Claim 1, Element [d]: "in response to an edge of the electronic document**

17 **being reached while translating the electronic document in the first direction while the**

18 **object is still detected on or near the touch screen display: displaying an area beyond the**

19 **edge of the document, and displaying a third portion of the electronic document, wherein**

20 **the third portion is smaller than the first portion; and"**

21 84.   The ordinary and intended use of all the Accused Products (Gallery) meets this

22 claim limitation. Like its physical counterpart, a digital photograph displayed on the Samsung

23 devices has a rectangular shape bounded by four edges. As the user scrolls around the image to

24 view each portion, he may, while scrolling in one direction, encounter the edge of the photograph,

25 but perhaps not realizing it, attempt to continue scrolling in the same direction beyond the edge.

26 When this occurs, the photograph will keep scrolling in the same direction and, as it is scrolled, a

27 black region will fill in the area beyond the edge of the photograph, in effect providing a visual

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1   indication that the image does not extend any further and that the edge of the image has been

2   reached.

3   85.   By way of example, the Exhibit 4G phone, in response to reaching an edge of a

4   photograph, while a finger continues to move the photograph in the same direction, will display a

5   black region beyond the edge of the photograph, and thereby display a smaller third portion of the

6   photograph, as depicted below.

Figure 3:
Displaying "area beyond edge" and smaller "third portion" while moving document in first direction

(Ex. 3.)

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15   86.   The source code for the Gallery application on the Exhibit 4G phone confirms

16   what I experienced while using this device. The detection of a user's finger and translation of the

17   electronic document are performed in the following source code modules: RenderView.java,

18   GLSurfaceView.java, GridLayer.java, and GridInputProcessor.java. (SAMNDCA-C000007890-

19   7999; *see also* SAMNDCA-C000008045 - 8180; SAMNDCA-C000007702-7746.) The

20   GridInputProcessor.java file identifies the edge of the photograph and displays an area beyond the

21   edge of the photograph.

22   87.   Each of the other Accused Products (Gallery) exhibits the same behavior. The

23   Gallery application on each of these products, in response to reaching an edge of a photograph

24   while scrolling, and while a finger continues to move the photograph in the same direction, will

25   also display a black region beyond the edge of the photograph, and thereby display a smaller third

26   portion of the photograph, as demonstrated in Exhibits 3, V1, V3, V5, and V8. It is my opinion

27   that the ordinary and intended use of all these Samsung devices meets this claim limitation.

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88.   To the extent that this limitation is not met literally, in my opinion it is met under the doctrine of equivalents because the Accused Products (Gallery) are insubstantially different from the device as recited in claim 1.

89.   In particular, the devices with touch screen displays perform substantially the same function of displaying an area beyond the edge of the electronic document in response to an edge of the electronic document being reached while translating the electronic document in the first direction, substantially the same way by displaying an area beyond the edge of the electronic document when a user attempts to move the electronic document beyond its edge, to achieve substantially the same result of showing an area beyond the edge of the electronic document.

90.   In addition, displaying black in an area beyond the edge of a document on a screen by not illuminating the area is not substantially different from doing so by filtering or blocking light in the area. An AMOLED screen displaying black operates to perform substantially the same function (displaying a black area), in substantially the same way (avoiding emission of light), to obtain substantially the same result (showing a black area) as a screen that displays black by filtering or blocking light.

91.   **Claim 1, Element [e]: "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."**

92.   The ordinary and intended use of all the Accused Products (Gallery) meets this claim limitation. In the Gallery application on these Samsung devices, once the user encounters the edge of a photograph, if he continues to move his finger in the same direction, more of the area beyond the edge of the photograph will be revealed as long as the user keeps his finger on or near the touch screen device. Eventually, either because he has reached the edge of the touch screen itself or otherwise wants to stop scrolling, the user will lift his finger off the screen, thereby terminating contact. When this happens, the photograph will scroll back to cover the area beyond the edge that was previously displayed.

1   93.   By way of example, the Exhibit 4G phone, in response to detecting that the finger

2   is no longer on the touch screen, will scroll the photograph in the other direction until the area

3   beyond the edge of the photograph is no longer displayed. What is then displayed constitutes a

4   fourth portion of the photograph that is different from the first portion, as depicted below.

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Figure 4:
When finger is lifted, document is moved in second direction to display "fourth portion" with no "area beyond edge"

(Ex. 3.)

14   94.   The entire sequence is depicted below in a side by side comparison. None of the

15   portions of the photograph as represented in Figures 1 – 4 is identical to another displayed portion.

| **Figure 1:** Displaying "first portion" of electronic document | **Figure 2:** Displaying "second portion" by moving in first direction in response to finger movement | **Figure 3:** Displaying "area beyond edge" and smaller "third portion" while moving in first direction | **Figure 4:** When finger is lifted, document is moved in second direction to display "fourth portion" with no "area beyond edge" |

95.   The source code for the Gallery application on the Exhibit 4G confirms what I experienced while using this device. The detection of a user's lifting of his finger from the touch screen and translation of the electronic document in a second direction are performed in the following source code modules: GridInputProcessor.java and GridCameraManager.java. (SAMNDCA-C000007967-8007; *see also* SAMNDCA-C000008045-8180; SAMNDCA-C000007730-7746; SAMNDCA-C000007781-7786.)

96.   Each of the other Accused Products (Gallery), in response to detecting that the finger is no longer on the touch screen, will scroll the photograph in the other direction until the area beyond the edge of the photograph is no longer displayed. What is then displayed is a fourth portion of the photograph that is different from the first portion, as demonstrated in Exhibits 3, V1, V3, V5, and V8. It is my opinion that the ordinary and intended use of all these Samsung devices meets this claim limitation.

97.   To the extent that this limitation is not met literally, in my opinion it is met under the doctrine of equivalents because the Accused Products (Gallery) are insubstantially different from the device as recited in claim 1.

98.   In particular, the devices with touch screen displays perform substantially the same function of 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, substantially the same way by translating the electronic document so that it returns to fill the screen, to achieve substantially the same result of not showing an area beyond the edge of the electronic document.

99.   Based on the foregoing analysis of documents and the operation of the Accused Products (Gallery), as indicated in more detail in the accompanying exemplary claim chart, I conclude that each and every element of claim 1 is met by the ordinary and intended use of these Samsung devices. Therefore, the ordinary and intended use of these Samsung devices infringes that claim.

100.   Though my analysis is based on the plain and ordinary meaning of the term "edge of the electronic document," even under Samsung's construction ("a boundary of the electronic

1 document that distinguishes it from another electronic document, other content, or a background

2 area"), each and every element of claim 1 is met by the ordinary and intended use of these

3 Samsung devices since the edge of the electronic document that is reached, and beyond which is a

4 distinct region, is a "boundary of the electronic document that distinguishes it from . . . a

5 background area."

6   101.   I note that the ordinary and intended use of the Accused Products (Browser),

7 Accused Products (Contacts), and Accused Products (ThinkFree Office) also infringes this claim,

8 but through the Browser, Contacts, and ThinkFree Office applications, which are described in

9 detail in my discussion of claims 6, 8, and 9 below.

10   102.   Although it is my opinion that the ordinary and intended use of the Accused

11 Products (Gallery), Accused Products (Browser), Accused Products (Contacts), and Accused

12 Products (ThinkFree Office) as described above literally infringes claim 1, in the alternative it is

13 my opinion that such use would infringe under the doctrine of equivalents. It is my opinion that

14 these devices perform substantially the same functions, in substantially the same way, to achieve

15 substantially the same results as in the limitations of claim 1, and that any differences between the

16 operation of these products and the limitations of claim 1 is insubstantial.

17   **G.   Samsung's Infringement of Claim 2 of the '381 Patent**

18   103.   **Claim 2**: Claim 2 recites:

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> 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.

22   104.   Claim 2 depends from claim 1 and further requires that each of the four portions of

23 an electronic document, or more specifically in this case, a photograph, is displayed at the same

24 magnification. As can be seen in the side by side comparison of the four figures, or portions,

25 above and in Exhibit 3, all of the portions are displayed at the same magnification.

26   105.   Accordingly, it is my opinion that the ordinary and intended use of the Accused

27 Products (Gallery) infringes claim 2. I note that the ordinary and intended use of the Accused

28 Products (Browser), Accused Products (Contacts), and Accused Products (ThinkFree Office) also

infringes this claim, but through the Browser, Contacts, and ThinkFree Office applications, which

are described in detail in my discussion of claims 6, 8, and 9 below.

H.   Samsung's Infringement of Claim 3 of the '381 Patent

106.   **Claim 3**: Claim 3 recites:

> The computer-implemented method of claim 1, wherein the
> movement of the object is on the touch screen display.

107.   Claim 3 depends from claim 1 and further requires that the movement of the

object, such as the user's finger, is on the touch screen display. As can be seen in the side by side

comparison of the four figures above and in Exhibit 3, the movement of the finger is on the touch

screen display.

108.   Accordingly, it is my opinion that the ordinary and intended use of the Accused

Products (Gallery) infringes claim 3. I note that the ordinary and intended use of the Accused

Products (Browser), Accused Products (Contacts), and Accused Products (ThinkFree Office) also

infringes this claim, but through the Browser, Contacts, and ThinkFree Office applications, which

are described in detail in my discussion of claims 6, 8, and 9 below.

I.   Samsung's Infringement of Claim 4 of the '381 Patent
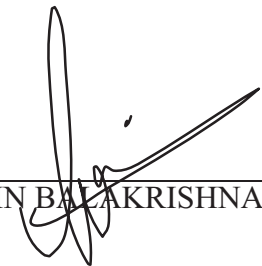
109.   **Claim 4**: Claim 4 recites:

> The computer-implemented method of claim 1, wherein the object
> is a finger.

110.   Claim 4 depends from claim 1 and further requires that the object in contact with

or proximity to the touch screen is a finger. As can be seen in the side by side comparison of the

four figures above and in Exhibit 3, the object in contact with the touch screen is a finger.

111.   Accordingly, it is my opinion that use of the Accused Products (Gallery) infringes

claim 4. I note that the ordinary and intended use of the Accused Products (Browser), Accused

Products (Contacts), and Accused Products (ThinkFree Office) also infringes this claim, but

through the Browser, Contacts, and ThinkFree Office applications, which are described in detail

in my discussion of claims 6, 8, and 9 below.

J.   Samsung's Infringement of Claim 5 of the '381 Patent

112.   **Claim 5**: Claim 5 recites:

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2   **AA.   Supplementation**

3   267.   I reserve the right to supplement this report with new information and/or

4   documents that may be discovered or produced in this case, or to address any new claim

5   constructions offered by Samsung or ordered by the Court.

6   268.   In connection with my anticipated testimony in this action, I may use as exhibits

7   various documents produced in this case that refer or relate to the matters discussed in this

8   report. In addition, I may have demonstrative exhibits prepared to assist in the presentation of my

9   testimony and opinions as set forth or cited in my report.

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12   Dated: March 22, 2012   _____
                                                RAVIN BALAKRISHNAN
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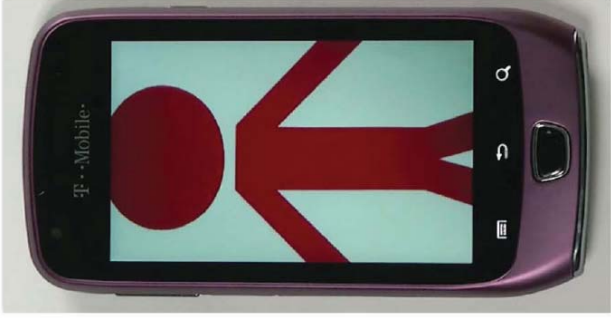
EXHIBIT 3

Exhibit 3 – Infringement Claim Chart for U.S. Patent No. 7,469,381

Claim 1 of U.S. Patent No. 7,469,381	Representative Samsung Products
A computer-implemented method, comprising: at a device with a touch screen display:	The Exhibit 4G phone is a mobile computing device with a touch screen display. **Features of Your Phone** Your phone is lightweight, easy-to-use and offers many significant features. The following list outlines a few of the features included in your phone. • Touch screen with virtual (on-screen) QWERTY keyboard (Exhibit 4G phone User Manual (APLNDC-Y0000066320).) **Features of Your Phone** Your phone is lightweight, easy-to-use and offers many significant features. The following list outlines a few of the features included in your phone. • Touch screen with virtual QWERTY keyboard (Vibrant User Manual (APLNDC-Y0000057339).) **Features of Your Phone** Your phone is lightweight, easy-to-use and offers many useful features. The following list outlines a few of the features included in your phone. • Touch screen provides quick response to a variety of in-phone menus and options including applications and seven home screens (Captivate User Manual (APLNDC-Y0000062795).)

Claim 1 of U.S. Patent No. 7,469,381	Representative Samsung Products
	Features • 10.1-inch WXGA TFT (PLS) LCD touch screen (Galaxy Tab 10.1 User Manual (APLNDC-Y0000060376).)
displaying a first portion of an electronic document;	The Exhibit 4G phone includes an application called "Gallery" that displays electronic documents — more specifically, photographs — on the touch screen display. When running the "Gallery" application, the Exhibit 4G phone displays a first portion of a photograph. (Ex. V5.) **Figure 1:** *Displaying "first portion"* *of electronic document*
detecting a movement of an object on or near the touch screen display; in response to detecting the movement, translating the electronic document displayed on the touch screen display in a first direction to display a second portion of the electronic	The Exhibit 4G phone detects the movement of an "object" — for instance, a finger — on its touch screen. In response, it scrolls the photograph in the same direction to display a second, different portion of the photograph. (Ex. V5.)

Claim 1 of U.S. Patent No. 7,469,381	Representative Samsung Products
document, wherein the second portion is different from the first portion;	**Figure 2:** *Displaying "second portion" by moving document in first direction in response to finger movement on touch screen* first direction The detection of a user's finger and translation of the electronic document are performed in the following source code modules for the Exhibit 4G phone, which runs Android 2.3: RenderView.java, GLSurfaceView.java, GridLayer.java, and GridInputProcessor.java. (SAMNDCA-C000007890-7999.) Similar code for devices running Android 2.2 can be found, for example, at SAMNDCA-C000008045 - 8180. Similar source code for devices running Android 2.1 can be found, for example, at SAMNDCA-C000007702-7746. To the extent that Samsung contends that all instances of translating in the "first direction" require that the document be translated in the same direction with absolute precision and that a human finger is incapable of such precise movement, the use of the Exhibit 4G phone would nevertheless meet this limitation under the doctrine of equivalents. Translating a document in a first direction based on the movement of a human finger with minor irregularity is not substantially different from doing so based on an absolutely precise movement. Moreover, translating a document in a first direction based on the movement of a human finger operates to perform substantially

Claim 1 of U.S. Patent No. 7,469,381	Representative Samsung Products
	the same function (translating the document), in substantially the same way (by detecting the movement of an object), to obtain substantially the same result (translation of a document in a first direction) as translating based on the movement of an object with absolute precision.
in response to an edge of the electronic document being reached while translating the electronic document in the first direction while the object is still detected on or near the touch screen display: displaying an area beyond the edge of the document, and displaying a third portion of the electronic document, wherein the third portion is smaller than the first portion; and	In response to reaching an edge of a photograph, while a finger continues to move the photograph in the same direction, the Exhibit 4G phone displays a black region beyond the photograph's edge, and thus displays a third, smaller portion of the photograph. (Ex. V5.)

Figure 3: *Displaying "area beyond edge" and smaller "third portion" while moving document in first direction*

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Claim 1 of U.S. Patent No. 7,469,381	Representative Samsung Products
	GLSurfaceView.java, GridLayer.java, and GridInputProcessor.java. (SAMNDCA-C000007890-7999; *see also* SAMNDCA-C000008045 - 8180; SAMNDCA-C000007702-7746.) The GridInputProcessor.java file identifies the edge of the photograph and displays an area beyond the edge of the photograph. To the extent that Samsung contends any of the accused devices contain an AMOLED screen and that such screen does not "display[] an area beyond the edge" because the screen does not emit light or otherwise illuminate a black area, such device would nevertheless meet this limitation under the doctrine of equivalents. Displaying black in a specific area of a screen by not illuminating the area is not substantially different from doing so by filtering or blocking light in the area. Moreover, an AMOLED screen displaying black operates to perform substantially the same function (displaying a black area), in substantially the same way (avoiding emission of light), to obtain substantially the same result (showing a black area) as a screen that displays black by filtering or blocking light.

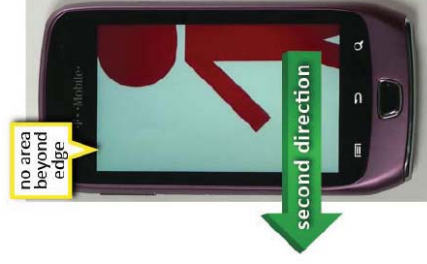| Claim 1 of U.S. Patent No. 7,469,381	Representative Samsung Products
in response to detecting that the object is no longer on or near the touch screen display, translating the electronic document in a second direction until the area beyond the edge of the electronic document is no longer displayed to display a fourth portion of the electronic document, wherein the fourth portion is different from the first portion.	In response to detecting that the finger is no longer on the touch screen, the Exhibit 4G phone scrolls the photograph in the opposite direction until it no longer displays the area beyond the photograph's edge. What is then displayed is a fourth portion of the photograph that is different from the first portion. (Ex. V5.) **Figure 4:** *When finger is lifted, document is moved in second direction to display "fourth portion" with no "area beyond edge"* no area beyond edge second direction The detection of a user's lifting of his finger from the touch screen and translation of the electronic document in a second direction are performed in the following source code modules: GridInputProcessor.java and GridCameraManager.java. (SAMNDCA-C000007967-8007; *see also* SAMNDCA-C000008045-8180; SAMNDCA-C000007730-7746; SAMNDCA-C000007781-7786.)

| Claim 2 of U.S. Patent No. 7,469,381	Representative Samsung Products
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.	The entire sequence illustrated in Claim 1 is depicted below in a side-by-side comparison for the Exhibit 4G phone. As is evident from this comparison, the portions of the photograph are displayed at the same magnification. (Ex. V5.) **Figure 1:** *Displaying "first portion" of electronic document* **Figure 2:** *Displaying "second portion" by moving in first direction in response to finger movement* **Figure 3:** *Displaying "area beyond edge" and smaller "third portion" while moving in first direction* **Figure 4:** *When finger is lifted, document is moved in second direction to display "fourth portion" with no "area beyond edge"*
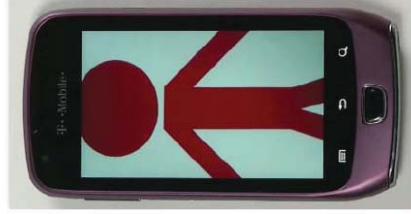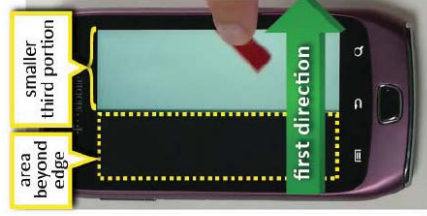
Claim 2 of U.S. Patent No. 7,469,381	Representative Samsung Products
	The entire sequence described in Claim 1 is depicted below in a side-by-side comparison for the Captivate. As is evident from this comparison, the portions of the photograph are displayed at the same magnification. (Ex. V1.)

Figure 5:
Displaying "first portion" of electronic document

Figure 6:
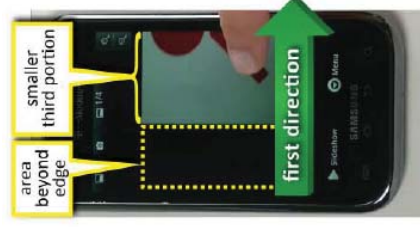*Displaying "second portion" by moving in first direction in response to finger movement*
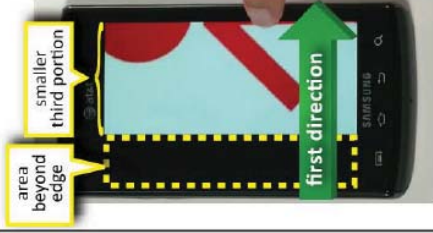
Figure 7:
Displaying "area beyond edge" and smaller "third portion" while moving in first direction

Figure 8:
When finger is lifted, document is moved in second direction to display "fourth portion" with no "area beyond edge"

Claim 2 of U.S. Patent No. 7,469,381	Representative Samsung Products
	The entire sequence described in Claim 1 is depicted below in a side-by-side comparison for the Vibrant. As is evident from this comparison, the portions of the photograph are displayed at the same magnification. (Ex. V3.)

Figure 9:
Displaying
"first portion"
of electronic
document

Figure 10:
Displaying
"second portion"
by moving
in first
direction
in response
to finger
movement

first direction

Figure 11:
Displaying
"area beyond
edge"
and smaller
"third portion"
while moving in
first direction

area beyond edge

smaller third portion

first direction

Figure 12:
When finger is lifted,
document is moved in
second direction to display
"fourth portion" with no
"area beyond edge"

no area beyond edge

second direction

Claim 2 of U.S. Patent No. 7,469,381	Representative Samsung Products
	The entire sequence described in Claim 1 is depicted below in a side-by-side comparison for the Galaxy Tab 10.1. As is evident from this comparison, the portions of the photograph are displayed at the same magnification. (Ex. V8.)
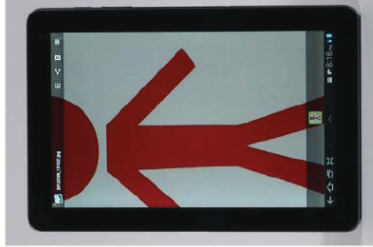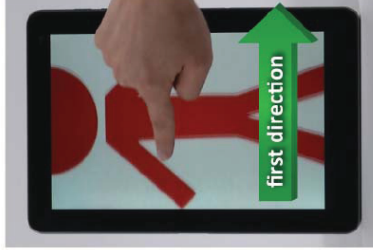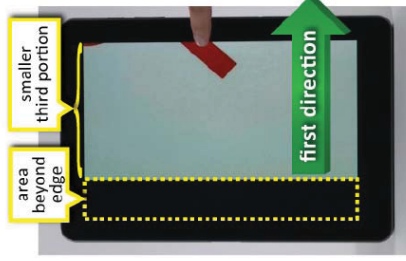
Figure 13:
Displaying "first portion" of electronic document

Figure 14:
Displaying "second portion" by moving in first direction in response to finger movement

Figure 15:
Displaying "area beyond edge" and smaller "third portion" while moving in first direction

Figure 16:
When finger is lifted, document is moved in second direction to display "fourth portion" with no "area beyond edge" |

Claim 3 of U.S. Patent No. 7,469,381	Representative Samsung Products
The computer-implemented method of claim 1, wherein the movement of the object is on the touch screen display.	In the sequences illustrated for Claims 1 and 2, the movement of the finger is on the touch screen display.

Claim 4 of U.S. Patent No. 7,469,381	Representative Samsung Products
The computer-implemented method of claim 1, wherein the object is a finger.	In the sequences illustrated in Claims 1 and 2, the object that moves on the touch screen display is a finger.

Claim 5 of U.S. Patent No. 7,469,381	Representative Samsung Products
The computer-implemented method of claim 1, wherein the first direction is a vertical direction, a horizontal direction, or a diagonal direction.	In the sequences illustrated in Claims 1 and 2, the first direction is a horizontal direction — specifically, to the right.

Claim 6 of U.S. Patent No. 7,469,381	Representative Samsung Products
The computer-implemented method of claim 1, wherein the electronic document is a web page.	On the Galaxy Tab 10.1, for example, the method of claim 1 can be performed using a web page. (Ex. V9.) **Figure 17:** *Displaying "first portion" of electronic document* **Figure 18:** *Displaying "second portion" by moving in first direction in response to finger movement* **Figure 19:** *Displaying "area beyond edge" and smaller "third portion" while moving in first direction* **Figure 20:** *When finger is lifted, document is moved in second direction to display "fourth portion" with no "area beyond edge"* The source code for detecting a user's finger movement, translating an electronic document, detecting a user's lifting of his finger from the touch screen, and translating an electronic document in a second direction can be found in the following source code modules in the Galaxy Tab 10.1's Browser application: WebView.java and View.java. (SAMNDCA-C000003501 – 3549.)

- 12 -

Claim 7 of U.S. Patent No. 7,469,381	Representative Samsung Products
The computer-implemented method of claim 1, wherein the electronic document is a digital image.	In the sequence illustrated in Claim 1, the electronic document is a digital image, namely a digital photograph.

Claim 8 of U.S. Patent No. 7,469,381	Representative Samsung Products
The computer-implemented method of claim 1, wherein the electronic document is a word processing, spreadsheet, email or presentation document.	On the Exhibit 4G phone, for example, the method of claim 1 can be performed using a presentation document. (Ex. V7.) **Figure 21:** *Displaying "first portion" of electronic document* **Figure 22:** *Displaying "second portion" by moving in first direction in response to finger movement* **Figure 23:** *Displaying "area beyond edge" and smaller "third portion" while moving in first direction* **Figure 24:** *When finger is lifted, document is moved in second direction to display "fourth portion" with no "area beyond edge"*
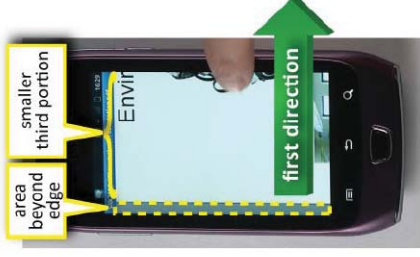
Claim 9 of U.S. Patent No. 7,469,381	Representative Samsung Products
The computer-implemented method of claim 1, wherein the electronic document includes a list of items.	The Exhibit 4G phone also includes an application called "Contacts" that displays an electronic document including a list of items — specifically, a list of contacts — on the touch screen display. When running the "Contacts" application, the Exhibit 4G phone performs the method of claim 1. (Ex. V6.)

Figure 25: *Displaying "first portion" of electronic document*

Figure 26: *Displaying "second portion" by moving in first direction in response to finger movement*
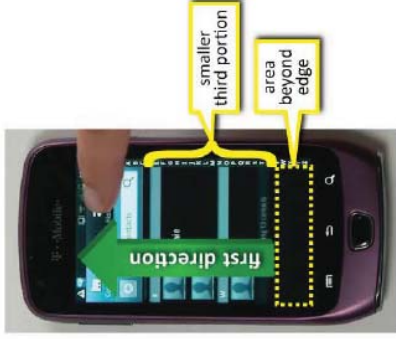
Figure 27: *Displaying "area beyond edge" and smaller "third portion" while moving in first direction*

Figure 28: *When finger is lifted, document is moved in second direction to display "fourth portion" with no "area beyond edge"*

| Claim 9 of U.S. Patent No. 7,469,381	Representative Samsung Products
	The Captivate also includes an application called "Contacts" that displays an electronic document including a list of items — specifically, a list of contacts — on the touch screen display. When running the "Contacts" application, the Captivate performs the method of claim 1. (Ex. V2.) **Figure 29:** Displaying "first portion" of electronic document **Figure 30:** Displaying "second portion" by moving in first direction in response to finger movement **Figure 31:** Displaying "area beyond edge" and smaller "third portion" while moving in first direction **Figure 32:** When finger is lifted, document is moved in second direction to display "fourth portion" with no "area beyond edge"

Claim 9 of U.S. Patent No. 7,469,381	Representative Samsung Products
	The Vibrant also includes an application called "Contacts" that displays an electronic document including a list of items — specifically, a list of contacts — on the touch screen display. When running the "Contacts" application, the Vibrant performs the method of claim 1. (Ex. V4.)

Figure 33:
Displaying "first portion" of electronic document

Figure 34:
Displaying "second portion" by moving in first direction in response to finger movement
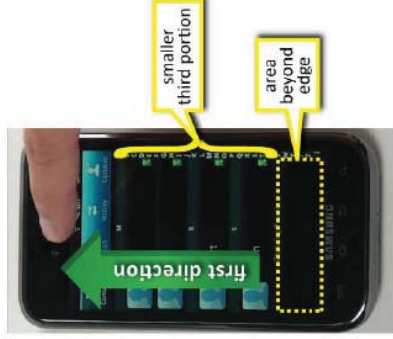
Figure 35:
Displaying "area beyond edge" and smaller and smaller "third portion" while moving in first direction

Figure 36:
When finger is lifted, document is moved in second direction to display "fourth portion" with no "area beyond edge"

Claim 10 of U.S. Patent No. 7,469,381	Representative Samsung Products
The computer-implemented method of claim 1, wherein the second direction is opposite the first direction.	In the sequence illustrated in Claim 1, the "first direction" is to the right, while the "second direction" is opposite, to the left. (*See also* Exs. V1-V9.)

Claim 11 of U.S. Patent No. 7,469,381	Representative Samsung Products
The computer-implemented method of claim 1, wherein translating in the first direction prior to reaching an edge of the document has an associated speed of translation that corresponds to a speed of movement of the object.	In Exhibits V1-V9, the speed of translation of the photograph, contacts list, web page, or presentation document prior to reaching an edge of the document corresponds to the speed of movement of the user's finger.

Claim 13 of U.S. Patent No. 7,469,381	Representative Samsung Products
The computer-implemented method of claim 1, wherein the area beyond the edge of the document is black, gray, a solid color, or white.	In Exhibits V1, V3, V5, V7, V8, and V9, the areas beyond the edges of the photographs are black, and the area beyond the edge of the presentation document is gray.

Claim 14 of U.S. Patent No. 7,469,381	Representative Samsung Products
The computer-implemented method of claim 1, wherein the area beyond the edge of the document is visually distinct from the document.	In Exhibits V1, V3, V5, V7, V8, and V9, the areas beyond the edges of the photographs are black, and the area beyond the edge of the presentation document is gray. These areas are visually distinct, respectively, from the photographs themselves, which are in color, and the presentation document, which is white with additional colors.

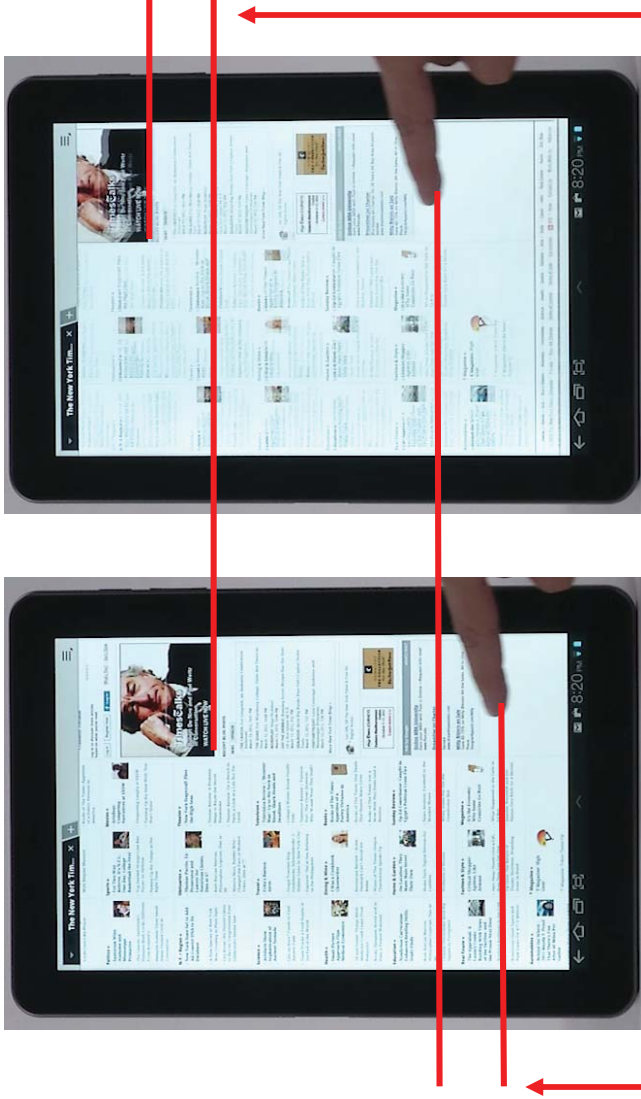| Claim 15 of U.S. Patent No. 7,469,381	Representative Samsung Products
The computer-implemented method of claim 1, wherein translating the document in the second direction is a damped motion.	In Exhibits V1, V3, V5, and V8, as the electronic document scrolls back in the second direction to fill the screen, it exhibits damped motion and slows as it reaches the end of its movement.

Claim 16 of U.S. Patent No. 7,469,381	Representative Samsung Products
The computer-implemented method of claim 1, wherein changing from translating in the first direction to translating in the second direction until the area beyond the edge of the document is no longer displayed makes the edge of the electronic document appear to be elastically attached to an edge of the touch screen display or to an edge displayed on the touch screen display.	In the sequence illustrated in Claim 1, in response to detecting that the finger is no longer on the touch screen, the Exhibit 4G phone changes from scrolling the photograph in the first direction (to the right) to scrolling the photograph in the opposite direction (to the left). This change makes the photograph appear to "snap" or "bounce" back to the left, as though the photograph were elastically attached to the edge of the touch screen display. (*See also* Exs. V1 – V6, V8, V9.)

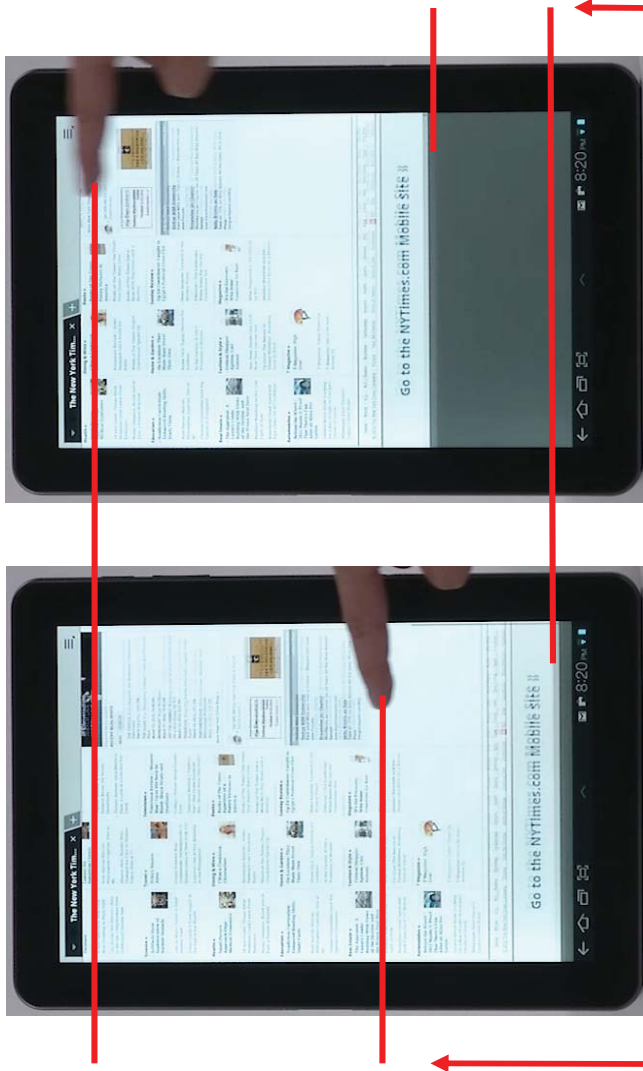| Claim 17 of U.S. Patent No. 7,469,381	Representative Samsung Products
The computer-implemented method of claim 1, wherein translating in the first direction prior to reaching the edge of the electronic document has a first associated translating distance that corresponds to a distance of movement of the object prior to reaching the edge of the electronic document; and wherein displaying an area beyond the edge of the electronic document comprises translating the electronic document in the first direction for a second associated translating distance, wherein the second associated translating distance is less than a distance of movement of the object after reaching the edge of the electronic document.	On the Galaxy Tab 10.1, translating in the first direction prior to reaching the edge of the electronic document has a first associated translating distance that corresponds to a distance of movement of the user's finger prior to reaching the edge of the electronic document. **Figure 37**

Claim 17 of U.S. Patent No. 7,469,381	Representative Samsung Products
	When the Galaxy Tab 10.1 displays an area beyond the edge of the electronic document, it translates the electronic document in the first direction for a second associated translating distance. The second associated translating distance is less than a distance of movement of the user's finger after reaching the edge of the electronic document.

Finger Movement

Document Movement

Figure 38

Claim 18 of U.S. Patent No. 7,469,381	Representative Samsung Products
The computer-implemented method of claim 1, wherein translating in the first direction prior to reaching the edge of the electronic document has a first associated translating speed that corresponds to a speed of movement of the object, and wherein displaying an area beyond the edge of the electronic document comprises translating the electronic document in the first direction at a second associated translating speed, wherein the second associated translating speed is slower than the first associated translating speed.	On the Galaxy Tab 10.1, translating in the first direction prior to reaching the edge of the electronic document has a first associated translating speed that corresponds to a speed of movement of the user's finger. The speed of translation is essentially the same as the speed with which the user's finger moves. **Figure 39**

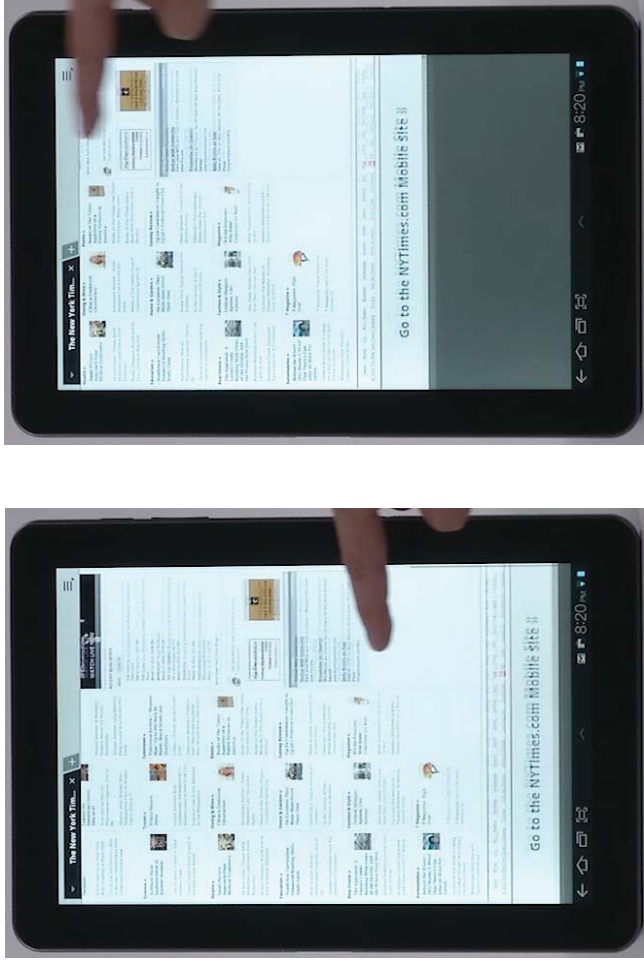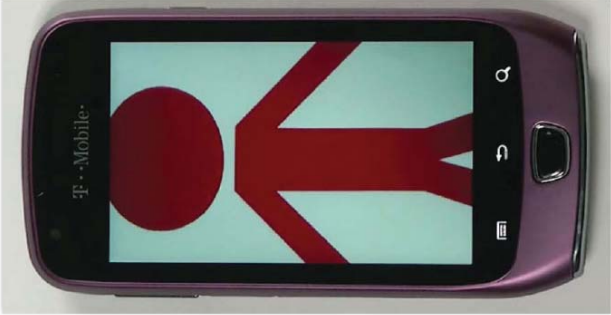| Claim 18 of U.S. Patent No. 7,469,381	Representative Samsung Products
	When the Galaxy Tab 10.1 displays an area beyond the edge of the electronic document, it translates the electronic document in the first direction at a second associated translating speed. The second associated translating speed is slower than the first associated translating speed. The document translates more slowly in the first direction when the area beyond the edge is displayed. **Figure 40**

Claim 19 of U.S. Patent No. 7,469,381	Representative Samsung Products
A device, comprising: a touch screen display; one or more processors; memory; and one or more programs, wherein the one or more programs are stored in the memory and configured to be executed by the one or more processors, the programs including:	The Exhibit 4G phone, Vibrant, Captivate, and Galaxy Tab 10.1 are mobile computing devices with touch screen displays, processors, and memory.

The Exhibit 4G phone, Vibrant, Captivate, and Galaxy Tab 10.1 are mobile computing devices with touch screen displays, processors, and memory.

Features of Your Phone

Your phone is lightweight, easy-to-use and offers many significant features. The following list outlines a few of the features included in your phone.

- Touch screen with virtual (on-screen) QWERTY keyboard

(Exhibit 4G phone User Manual (APLNDC-Y0000066320).)

Features of Your Phone

Your phone is lightweight, easy-to-use and offers many significant features. The following list outlines a few of the features included in your phone.

- Touch screen with virtual QWERTY keyboard

(Vibrant User Manual (APLNDC-Y0000057339).)

Features of Your Phone

Your phone is lightweight, easy-to-use and offers many useful features. The following list outlines a few of the features included in your phone.

- Touch screen provides quick response to a variety of in-phone menus and options including applications and seven home screens

(Captivate User Manual (APLNDC-Y0000062795).)

Features

- 10.1-inch WXGA TFT (PLS) LCD touch screen

(Galaxy Tab 10.1 User Manual (APLNDC-Y0000060376).)

Claim 19 of U.S. Patent No. 7,469,381	Representative Samsung Products
	• Exhibit 4G: "1-GHz Hummingbird" processor that uses "Android 2.3, Gingerbread OS." (APLNDC-Y0000066850)
	• Vibrant: "1 GHz Cortex A8 Hummingbird Application Processor" that uses "Android 2.2, Froyo." (APLNDC-Y0000066798);
	• Captivate: "1 GHz, Cortex A8 Hummingbird Processor" that uses "Android 2.3, Gingerbread." (APLNDC-Y0000066835); and
	• Galaxy Tab 10.1: "1 Ghz Dual Core Nvidia Tegra2 Processor" that uses "Android 3.2, Honeycomb." (APLNDC-Y0000066820-821.)
	• Exhibit 4G: "Internal Memory" of "512 MB." (APLNDC-Y0000066850);
	• Vibrant: "Internal Memory" of "2 GB." (APLNDC-Y0000066800);
	• Captivate: "Internal Memory" of "2 GB." (APLNDC-Y0000066836); and
	• Galaxy Tab 10.1: "16 GB Internal Memory." (APLNDC-Y0000066850.)

Claim 19 of U.S. Patent No. 7,469,381	Representative Samsung Products
instructions for displaying a first portion of an electronic document;	The Exhibit 4G phone includes an application called "Gallery" with instructions for displaying electronic documents — more specifically, photographs — on the touch screen display. When running the "Gallery" application, the Exhibit 4G phone displays a first portion of a photograph. (Ex. V5.)

Figure 1:
Displaying "first portion" of electronic document

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Claim 19 of U.S. Patent No. 7,469,381	Representative Samsung Products
instructions for detecting a movement of an object on or near the touch screen display; instructions for translating the electronic document displayed on the touch screen display in a first direction to display a second portion of the electronic document, wherein the second portion is different from the first portion, in response to detecting the movement;	The Exhibit 4G phone includes instructions for detecting the movement of an "object" — for instance, a finger — on its touch screen. In response, it scrolls the photograph in the same direction to display a second, different portion of the photograph. (Ex. V5.) **Figure 2:** *Displaying "second portion" by moving document in first direction in response to finger movement on touch screen* first direction The detection of a user's finger and translation of the electronic document are performed in the following source code modules for the Exhibit 4G phone, which runs Android 2.3: RenderView.java, GLSurfaceView.java, GridLayer.java, and GridInputProcessor.java. (SAMNDCA-C000007890-7999.) Similar code for devices running Android 2.2 can be found, for example, at SAMNDCA-C000008045 - 8180. Similar source code for devices running Android 2.1 can be found, for example, at SAMNDCA-C000007702-7746. To the extent that Samsung contends that all instances of translating in the "first direction" require that the document be translated in the same direction with absolute precision and that a human finger is incapable of such precise movement, the use of the

Claim 19 of U.S. Patent No. 7,469,381	Representative Samsung Products
	Exhibit 4G phone would nevertheless meet this limitation under the doctrine of equivalents. Translating a document in a first direction based on the movement of a human finger with minor irregularity is not substantially different from doing so based on an absolutely precise movement. Moreover, translating a document in a first direction based on the movement of a human finger operates to perform substantially the same function (translating the document), in substantially the same way (by detecting the movement of an object), to obtain substantially the same result (translation of a document in a first direction) as translating based on the movement of an object with absolute precision.

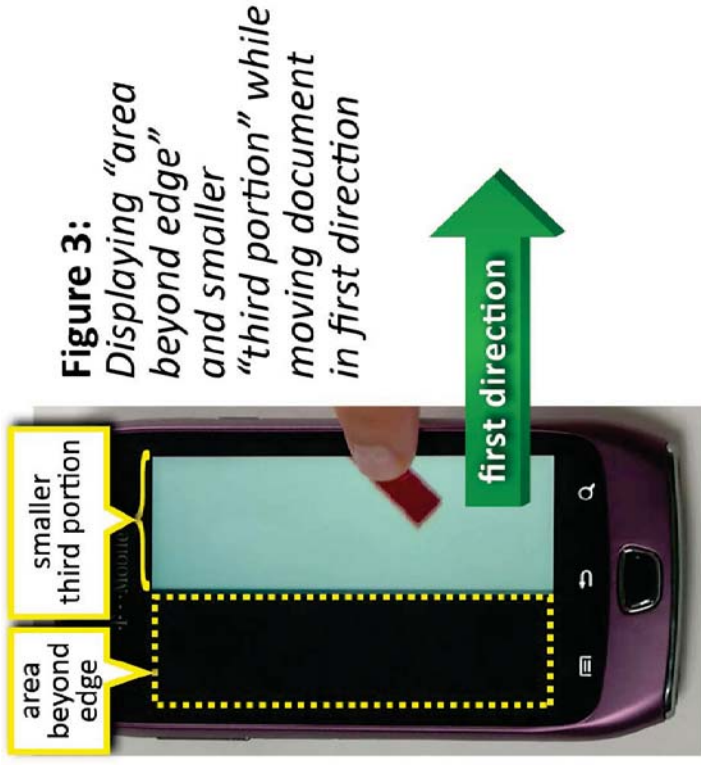| Claim 19 of U.S. Patent No. 7,469,381	Representative Samsung Products
instructions for displaying an area beyond an edge of the electronic document and displaying a third portion of the electronic document, wherein the third portion is smaller than the first portion, in response to the edge of the electronic document being reached while translating the electronic document in the first direction while the object is still detected on or near the touch screen display; and	The Exhibit 4G phone includes instructions for displaying a black region beyond the photograph's edge in response to reaching an edge of a photograph, while a finger continues to move the photograph in the same direction, and thus displays a third, smaller portion of the photograph. (Ex. V5.) **Figure 3:** *Displaying "area beyond edge" and smaller "third portion" while moving document in first direction*

Claim 19 of U.S. Patent No. 7,469,381	Representative Samsung Products
	To the extent that Samsung contends any of the accused devices contain an AMOLED screen and that such screen does not "display[] an area beyond the edge" because the screen does not emit light or otherwise illuminate a black area, such device would nevertheless meet this limitation under the doctrine of equivalents. Displaying black in a specific area of a screen by not illuminating the area is not substantially different from doing so by filtering or blocking light in the area. Moreover, an AMOLED screen displaying black operates to perform substantially the same function (displaying a black area), in substantially the same way (avoiding emission of light), to obtain substantially the same result (showing a black area) as a screen that displays black by filtering or blocking light.

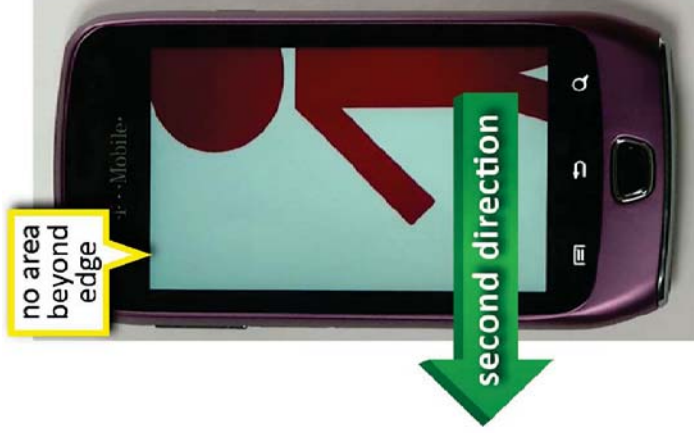| Claim 19 of U.S. Patent No. 7,469,381	Representative Samsung Products
instructions for translating the electronic document in a second direction until the area beyond the edge of the electronic document is no longer displayed to display a fourth portion of the electronic document, wherein the fourth portion is different from the first portion, in response to detecting that the object is no longer on or near the touch screen display.	The Exhibit 4G phone includes instructions for scrolling the photograph in the opposite direction until it no longer displays the area beyond the photograph's edge, in response to detecting that the finger is no longer on the touch screen. What is then displayed is a fourth portion of the photograph that is different from the first portion. (Ex. V5.) **Figure 4:** *When finger is lifted, document is moved in second direction to display "fourth portion" with no "area beyond edge"* no area beyond edge second direction The detection of a user's lifting of his finger from the touch screen and translation of the electronic document in a second direction are performed in the following source code modules: GridInputProcessor.java and GridCameraManager.java. (SAMNDCA-C000007967-8007; *see also* SAMNDCA-C000008045-8180; SAMNDCA-C000007730-7746; SAMNDCA-C000007781-7786.)

Claim 20 of U.S. Patent No. 7,469,381	Representative Samsung Products
A computer readable storage medium having stored therein instructions, which when executed by a device with a touch screen display, cause the device to:	The Exhibit 4G phone, Vibrant, Captivate, and Galaxy Tab 10.1 are mobile computing devices with touch screen displays, processors, and memory. **Features of Your Phone** Your phone is lightweight, easy-to-use and offers many significant features. The following list outlines a few of the features included in your phone. • Touch screen with virtual (on-screen) QWERTY keyboard (Exhibit 4G phone User Manual (APLNDC-Y0000066320).) **Features of Your Phone** Your phone is lightweight, easy-to-use and offers many significant features. The following list outlines a few of the features included in your phone. • Touch screen with virtual QWERTY keyboard (Vibrant User Manual (APLNDC-Y0000057339).) **Features of Your Phone** Your phone is lightweight, easy-to-use and offers many useful features. The following list outlines a few of the features included in your phone. • Touch screen provides quick response to a variety of in-phone menus and options including applications and seven home screens (Captivate User Manual (APLNDC-Y0000062795).) **Features** • 10.1-inch WXGA TFT (PLS) LCD touch screen

Claim 20 of U.S. Patent No. 7,469,381	Representative Samsung Products
	(Galaxy Tab 10.1 User Manual (APLNDC-Y0000060376).) • Exhibit 4G: "1-GHz Hummingbird" processor that uses "Android 2.3, Gingerbread OS." (APLNDC-Y0000066850) • Vibrant: "1 GHz Cortex A8 Hummingbird Application Processor" that uses "Android 2.2, Froyo." (APLNDC-Y0000066798); • Captivate: "1 GHz, Cortex A8 Hummingbird Processor" that uses "Android 2.3, Gingerbread." (APLNDC-Y0000066835); and • Galaxy Tab 10.1: "1 Ghz Dual Core Nvidia Tegra2 Processor" that uses "Android 3.2, Honeycomb." (APLNDC-Y0000066820-821.) • Exhibit 4G: "Internal Memory" of "512 MB." (APLNDC-Y0000066850); • Vibrant: "Internal Memory" of "2 GB." (APLNDC-Y0000066800); • Captivate: "Internal Memory" of "2 GB." (APLNDC-Y0000066836); and • Galaxy Tab 10.1: "16 GB Internal Memory." (APLNDC-Y0000066850.)

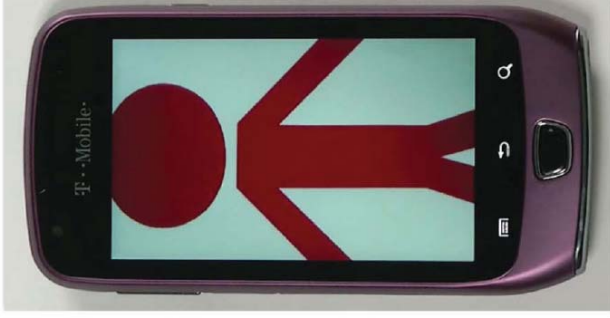| Claim 20 of U.S. Patent No. 7,469,381	Representative Samsung Products
display a first portion of an electronic document;	The Exhibit 4G phone includes an application called "Gallery" that displays electronic documents — more specifically, photographs — on the touch screen display. When running the "Gallery" application, the Exhibit 4G phone displays a first portion of a photograph. (Ex. V5.) **Figure 1:** *Displaying "first portion" of electronic document*

Claim 20 of U.S. Patent No. 7,469,381	Representative Samsung Products
detect a movement of an object on or near the touch screen display; translate the electronic document displayed on the touch screen display in a first direction to display a second portion of the electronic document, wherein the second portion is different from the first portion, in response to detecting the movement;	The Exhibit 4G phone detects the movement of an "object" — for instance, a finger — on its touch screen. In response, it scrolls the photograph in the same direction to display a second, different portion of the photograph. (Ex. V5.) **Figure 2:** *Displaying "second portion" by moving document in first direction in response to finger movement on touch screen* first direction The detection of a user's finger and translation of the electronic document are performed in the following source code modules for the Exhibit 4G phone, which runs Android 2.3: RenderView.java, GLSurfaceView.java, GridLayer.java, and GridInputProcessor.java. (SAMNDCA-C000007890-7999.) Similar code for devices running Android 2.2 can be found, for example, at SAMNDCA-C000008045-8180. Similar source code for devices running Android 2.1 can be found, for example, at SAMNDCA-C000007702-7746. To the extent that Samsung contends that all instances of translating in the "first direction" require that the document be translated in the same direction with absolute precision and that a human finger is incapable of such precise movement, the use of the

Claim 20 of U.S. Patent No. 7,469,381	Representative Samsung Products
	Exhibit 4G phone would nevertheless meet this limitation under the doctrine of equivalents. Translating a document in a first direction based on the movement of a human finger with minor irregularity is not substantially different from doing so based on an absolutely precise movement. Moreover, translating a document in a first direction based on the movement of a human finger operates to perform substantially the same function (translating the document), in substantially the same way (by detecting the movement of an object), to obtain substantially the same result (translation of a document in a first direction) as translating based on the movement of an object with absolute precision.

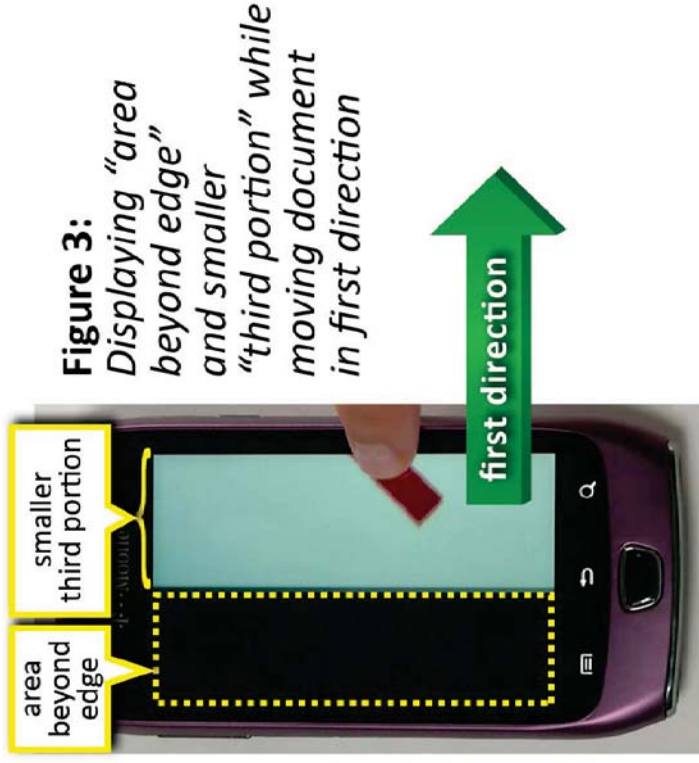| Claim 20 of U.S. Patent No. 7,469,381	Representative Samsung Products
display an area beyond an edge of the electronic document and display a third portion of the electronic document, wherein the third portion is smaller than the first portion, if the edge of the electronic document is reached while translating the electronic document in the first direction while the object is still detected on or near the touch screen display; and	In response to reaching an edge of a photograph, while a finger continues to move the photograph in the same direction, the Exhibit 4G phone displays a black region beyond the photograph's edge, and thus displays a third, smaller portion of the photograph. (Ex. V5.) **Figure 3:** *Displaying "area beyond edge" and smaller "third portion" while moving document in first direction* area beyond edge — smaller third portion — first direction The detection of a user's finger and translation of the electronic document are performed in the following source code modules: RenderView.java, GLSurfaceView.java, GridLayer.java, and GridInputProcessor.java. (SAMNDCA-C000007890-7999; *see also* SAMNDCA-C000008045 - 8180; SAMNDCA-C000007702-7746.) The GridInputProcessor.java file identifies the edge of the photograph and displays an area beyond the edge of the photograph.

Claim 20 of U.S. Patent No. 7,469,381	Representative Samsung Products
	To the extent that Samsung contends any of the accused devices contain an AMOLED screen and that such screen does not "display[] an area beyond the edge" because the screen does not emit light or otherwise illuminate a black area, such device would nevertheless meet this limitation under the doctrine of equivalents. Displaying black in a specific area of a screen by not illuminating the area is not substantially different from doing so by filtering or blocking light in the area. Moreover, an AMOLED screen displaying black operates to perform substantially the same function (displaying a black area), in substantially the same way (avoiding emission of light), to obtain substantially the same result (showing a black area) as a screen that displays black by filtering or blocking light.

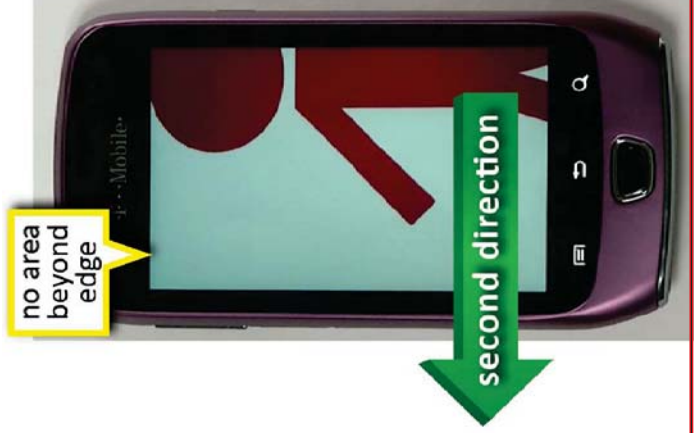| Claim 20 of U.S. Patent No. 7,469,381	Representative Samsung Products
translate the electronic document in a second direction until the area beyond the edge of the electronic document is no longer displayed to display a fourth portion of the electronic document, wherein the fourth portion is different from the first portion, in response to detecting that the object is no longer on or near the touch screen display.	In response to detecting that the finger is no longer on the touch screen, the Exhibit 4G phone scrolls the photograph in the opposite direction until it no longer displays the area beyond the photograph's edge. What is then displayed is a fourth portion of the photograph that is different from the first portion. (Ex. V5.) no area beyond edge second direction **Figure 4:** *When finger is lifted, document is moved in second direction to display "fourth portion" with no "area beyond edge"* The detection of a user's lifting of his finger from the touch screen and translation of the electronic document in a second direction are performed in the following source code modules: GridInputProcessor.java and GridCameraManager.java. (SAMNDCA-C000007967-8007; *see also* SAMNDCA-C000008045-8180; SAMNDCA-C000007730-7746; SAMNDCA-C000007781-7786.)