

# Exhibit A

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 9 Attorneys for Plaintiff and  
 Counterclaim-Defendant APPLE INC.

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 12 UNITED STATES DISTRICT COURT  
 13 NORTHERN DISTRICT OF CALIFORNIA  
 14 SAN JOSE DIVISION  
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 17 APPLE INC., a California corporation,  
 Plaintiff,

18 v.

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

Case No. 11-cv-01846-LHK

**DECLARATION OF KARAN  
 SINGH, PH.D., IN SUPPORT OF  
 APPLE’S REPLY IN SUPPORT  
 OF ITS MOTION FOR A  
 PERMANENT INJUNCTION  
 AND FOR DAMAGES  
 ENHANCEMENTS**

24  
 25 **\*\*CONFIDENTIAL – CONTAINS MATERIAL DESIGNATED AS HIGHLY**  
 26 **CONFIDENTIAL – ATTORNEYS’ EYES ONLY PURSUANT**  
 27 **TO A PROTECTIVE ORDER\*\***  
 28

1 I, KARAN SINGH, do hereby declare as follows:

2 1. I have personal knowledge of the facts set forth herein, and am competent to  
3 testify to the same.

4 2. I previously testified at deposition and at trial in this matter. I also submitted an  
5 Expert Infringement and Rebuttal Report, as well as a Declaration opposing Samsung's pre-trial  
6 summary judgment motion.

7 3. I submit this Declaration in support of Apple's Reply In Support of its Motion for  
8 a Permanent Injunction and for Damages Enhancement.

9 4. I reserve the right to supplement or amend this Declaration based on any new  
10 information that is relevant to my opinion.

11 5. Below I provide a very brief summary of my qualifications. I received my  
12 Bachelor of Technology degree in Computer Science from the Indian Institute of Technology in  
13 1991. I was awarded a Master of Science degree in 1992, and a Ph.D. in 1995, both in Computer  
14 and Information Science, from Ohio State University. Since 2002, I have been a Professor (or  
15 Associate Professor) of Computer Science at the University of Toronto where I co-direct a  
16 graphics and human computer interaction laboratory, dynamic graphics project. I can read and  
17 program fluently in object-oriented programming languages, including C++ and Java.

18 **II. MATERIALS CONSIDERED**

19 6. In forming my opinions in this Declaration, I reviewed a number of materials,  
20 including U.S. Patent Nos. 7,844,915 (the '915 Patent) as well as its file history, and relevant  
21 portions of the record in this case to date. I reviewed Mr. Gray's Declaration In Support of  
22 Samsung's Opposition to Apple's Motion for a Permanent Injunction and Damages Enhancement  
23 ("Gray Decl."). I also reviewed Mr. Gray's Declaration In Support of Samsung's Motion for  
24 Summary Judgment, Mr. Gray's Expert Invalidity and Rebuttal Reports, and his deposition and  
25 trial testimony.

26 7. I examined the "modified" source code for the Web Browser application made  
27 available by Samsung at Quinn Emanuel's office. I understand that Samsung represents that this  
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1 code is from Samsung Android version 4.0.4, Baseband Version T989UVL11, Kernel version  
2 3.0.8, and Build number IMM76D.UVL11. For ease of reference, I will refer to this code as the  
3 “modified code.” I also examined a Samsung Galaxy S III (T-Mobile) phone and a video of a  
4 Samsung Galaxy S II (T-Mobile) phone that I understand were running Samsung’s modified  
5 code.

6 8. [REDACTED]

7 [REDACTED]  
8 [REDACTED]  
9 [REDACTED]  
10 [REDACTED]  
11 [REDACTED]  
12 [REDACTED]  
13 [REDACTED]  
14 [REDACTED]  
15 [REDACTED]  
16 [REDACTED]  
17 [REDACTED]  
18 [REDACTED]

19 9. During my visit to Quinn Emanuel’s offices to review the modified code, I noticed  
20 that Samsung failed to provide a full code tree or folder as it would typically be kept in  
21 Samsung’s ordinary course of business. Samsung instead appears to have provided only a subset  
22 of source code files in folders created by attorneys. This stands in contrast to my prior reviews of  
23 Samsung code in this litigation, in which a full code tree was provided. The lack of a code tree  
24 makes it more difficult to determine the context of code and to identify missing files.  
25 Notwithstanding this additional challenge, it is my opinion that the modified code I reviewed  
26 demonstrates continuing infringement of the ’915 patent.

### III. SAMSUNG'S MODIFIED CODE LITERALLY INFRINGES THE '915 PATENT

10. I understand that Mr. Gray's Declaration only asserts that the modified code does not meet element [c] of claim 8 of the '915 patent, as highlighted below.

**Claim 8.** A machine readable storage medium storing executable program instructions which when executed cause a data processing system to perform a method comprising:

[a] receiving a user input, the user input is one or more input points applied to a touch-sensitive display that is integrated with the data processing system;

[b] creating an event object in response to the user input;

**[c] determining whether the event object invokes a scroll or gesture operation by distinguishing between a single input point applied to the touch-sensitive display that is interpreted as the scroll operation and two or more input points applied to the touch-sensitive display that are interpreted as the gesture operation**

[d] issuing at least one scroll or gesture call based on invoking the scroll or gesture operation;

[e] responding to at least one scroll call, if issued, by scrolling a window having a view associated with the event object;

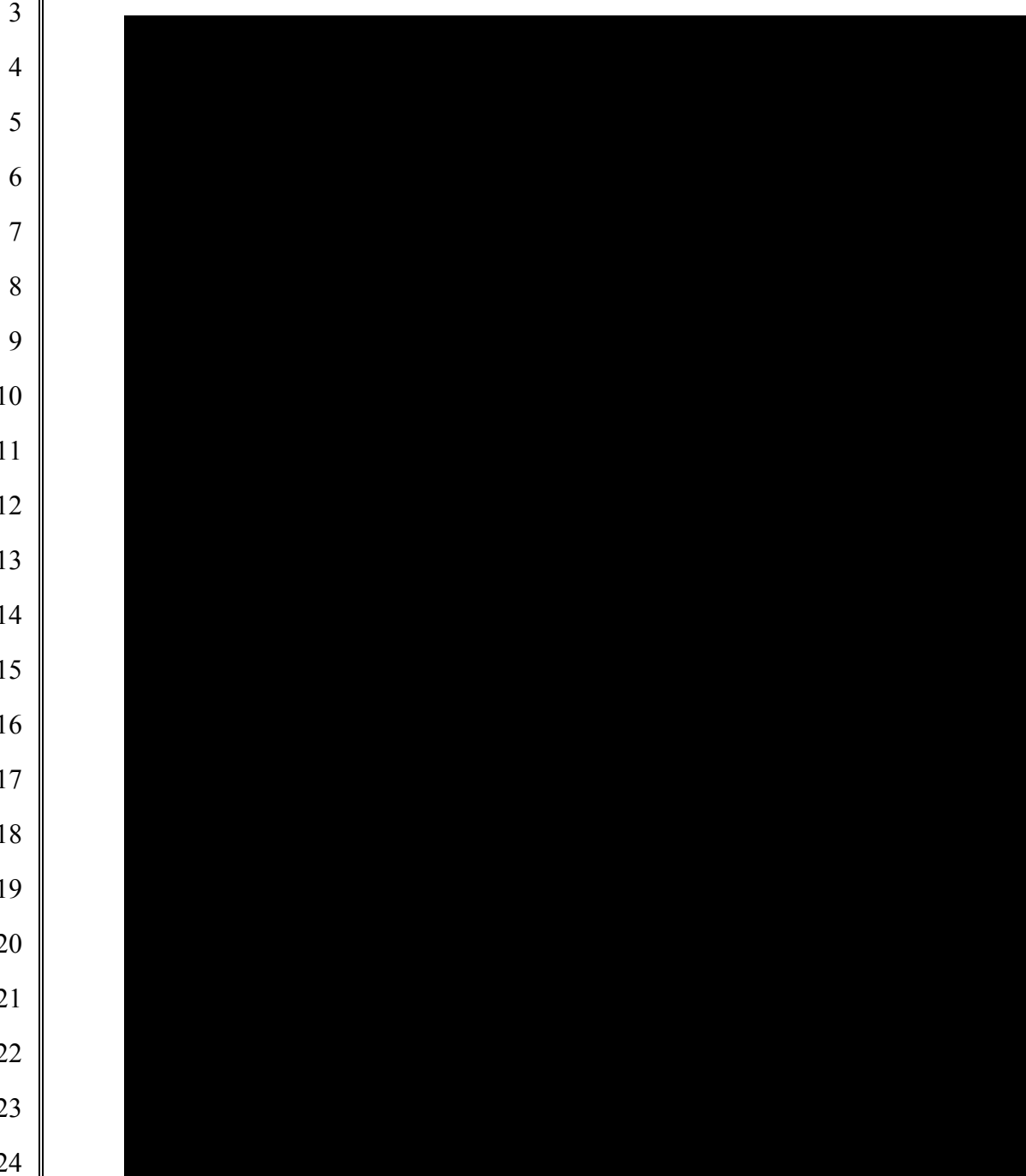
[f] responding to at least one gesture call, if issued, by scaling the view associated with the event object based on receiving the two or more input points in the form of the user input.

11. My observations and analysis show that the modified code continues to infringe the preamble and all limitations of claim 8. Because Samsung's Opposition Brief and Mr. Gray's Declaration do not contest that Samsung devices with the modified code infringe the preamble or the limitations Mr. Gray had labeled as [a], [b], [d], [e] and [f], but instead challenge only whether the Galaxy S II (T-Mobile) running the modified code meets limitation [c], I will focus on that limitation rather than reiterate all of the reasons why the other limitations are present in the modified code.

### IV. BACKGROUND

12. As Mr. Gray states in his Declaration, at trial I testified that various Samsung devices infringe the '915 patent. In explaining the test for determining whether the event object invokes a scrolling operation or a gesture operation, I referred to demonstratives numbered PDX

1 29.12 and PDX 29.13, reproduced below, to illustrate the operation of Samsung’s Android  
2 versions 2.1, 2.2, and 2.3:



25 13. I also testified at trial that the Galaxy Tab 10.1 infringes the ’915 patent, and  
26 explained that its Android 3.1 code is structured a bit differently than the code on the other  
27 Samsung Accused Products I analyzed at trial. The Android 3.1 logic allows for a more complex  
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1 “gesture transform” that simultaneously scales and translates the view. My testimony on that  
2 topic appears below for reference:

3 The Samsung Galaxy Tab 10.1 also infringes this claim, but for the  
4 purposes of claim – for elements C and D, it’s structured a little bit  
5 differently . . . . As you can see on [slide PDX 29.14], the schematic  
6 of the source code, it’s virtually – it’s very similar. And for the  
7 purposes of these claims, it’s actually identical.

8 You still have the motion event object causing this all-important  
9 test of one finger input or two or more fingers with inputs, so you  
10 still have the logical test. You still have the branching taking place  
11 in the code, and going down the scroll part results in a scroll call.  
12 Eventually it results in a scroll operation. Going down the gesture  
13 box essentially results in a gesture call and then the corresponding  
14 gesture operation.

15 This logic that you see actually allows the Galaxy Tab 10.1 to  
16 perform what you can think of as a more complex gesture transform  
17 where it simultaneously scales and translates the view. If you go  
18 back to that picture of a bicycle and imagine your fingers are down  
19 on the wheels of the bicycle and now you’re going to start to move  
20 your fingers around, moving – spreading them apart will scale the  
21 bicycle. But you also want to move it so that your fingers remain  
22 on the bicycle. If you don’t move with it, simultaneously, all of a  
23 sudden your bicycle is off in space and it’s bigger but it doesn’t  
24 have that direct feel. And that direct feel is what the Apple  
25 products provide.

26 Of the 24 infringing devices, only the – over here with this code,  
27 only the Samsung Galaxy Tab 10.1 kind of provides this, this – it  
28 makes it more like the Apple products.

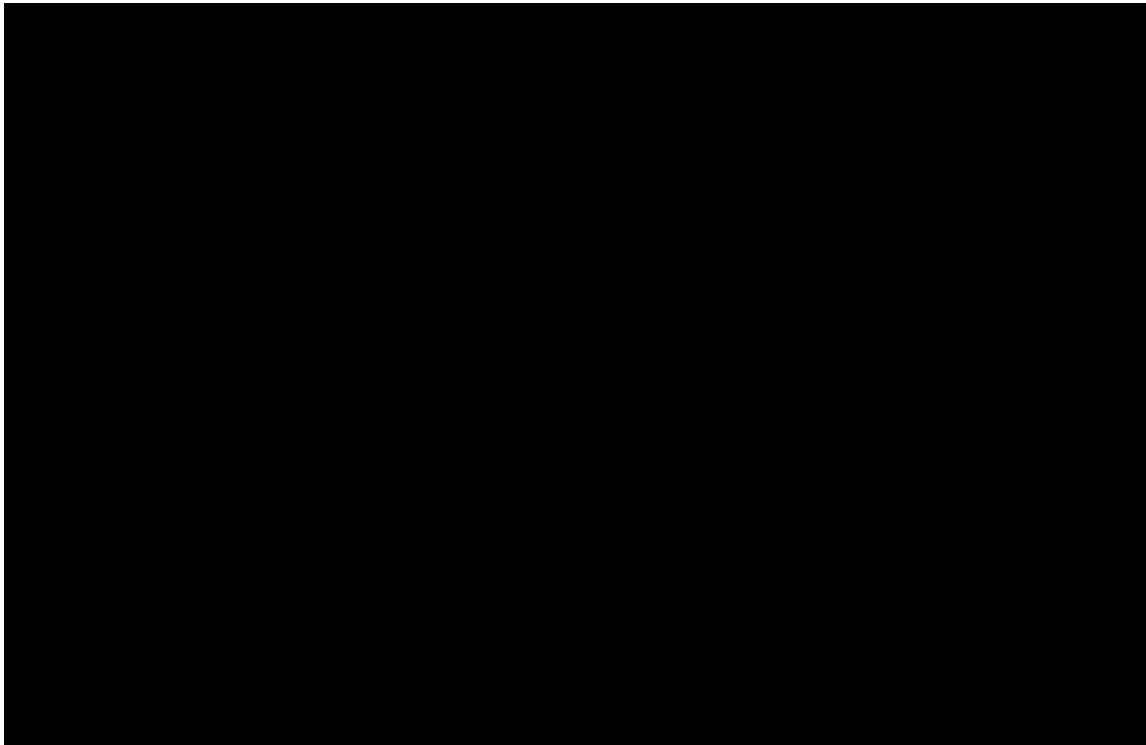
(Trial Tr. 1826:2-1827:17.)

19 14. During my testimony, I referred to the following demonstrative of the Galaxy Tab  
20 10.1 code. [REDACTED]

21 [REDACTED]


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15. I understand that Mr. Gray testified at trial that some Samsung products did not infringe because they performed two-finger scrolling. He stated: “[T]he patent calls for distinguishing between . . . a multipoint scale and a single point scroll. What I was able – what I’ve observed is that some of the devices do perform multipoint scrolling which, again, is contrary to the way the . . . patent claims operate.” (Trial Tr. 2912:12-19.) I testified at trial that the Android 3.1 code performs a two finger compound gesture operation that includes both scaling and translating.

16. I understand that the jury determined that 21 of 24 accused products infringed the ’915 patent. In finding infringement by the Galaxy Tab 10.1 (wifi) (JX1037), which runs the Android 3.1 code illustrated in PDX 29.14, the jury agreed that a device that performs two finger scrolling along with scaling still infringes the ’915 patent. In doing so, the jury implicitly rejected Mr. Gray’s non-infringement argument.

17. Mr. Gray’s Declaration omits my testimony and demonstratives relating to the Galaxy Tab 10.1 running Android version 3.1. 





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[REDACTED]

Copies of the pages from Mr. Gray’s deposition transcript that I cite are attached to the Hung Declaration as Exhibit 17.

18. I also note that Mr. Gray previously submitted a Declaration in support of Samsung’s pre-trial summary judgment motion. There, Mr. Gray alleged that the MotionEvent object did not “invoke” a scroll or gesture operation. I understand that Mr. Gray interpreted the term “invoke” to require that the event object itself must call a scroll or gesture operation directly, with no intervening steps. I submitted a Declaration disagreeing with Mr. Gray, as his interpretation was inconsistent with the ’915 patent specification.

19. I understand that the Court denied Samsung’s motion for summary judgment and instead agreed with me in construing “invokes” to mean “causes” or “causes a procedure to be carried out.” (Dkt. No. 1158.) Thus, the event object was not required to directly call a function.

20. Mr. Gray’s Declaration appears to rely upon earlier arguments that were rejected by the jury or this Court. [REDACTED]

[REDACTED] This is the same argument that the jury implicitly rejected in finding that the Galaxy Tab 10.1 infringes claim 8 of the ’915 patent.

21. Mr. Gray fails to analyze the code in sufficient detail to explain why the modified code purportedly does not infringe. [REDACTED]

[REDACTED]

22. Similarly, Mr. Gray asserts that [REDACTED]

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[REDACTED]

**V. SAMSUNG’S MODIFIED CODE STILL LITERALLY INFRINGES THE ’915 PATENT**

23. In my opinion, Samsung products with the modified code still literally infringe the ’915 patent. These products continue to determine whether an event object invokes a scroll or gesture operation by distinguishing between a single input point (one finger) applied to the touch-sensitive display that is interpreted as the scroll operation and two or more input points (more than one finger) applied to the touch-sensitive display that are interpreted as the gesture operation.

24. I examined the Web Browser application in a Samsung Galaxy S III (T-Mobile) phone that runs the modified Android 4.0.4 software. Using this device, I observed the exact same infringing behavior as in the old code. I scrolled web pages using one finger and zoomed in and out of web pages using two fingers. Attached as Exhibit A is a video of a Samsung Galaxy S II (T-Mobile) running the modified code that demonstrates this effect. [REDACTED]

[REDACTED]

Operation of the device demonstrates that the device still distinguishes between a single input point (one finger) and two or more input points (more than one finger). I also examined the modified source code provided by Samsung. [REDACTED]

[REDACTED]

25. [REDACTED]

[REDACTED]

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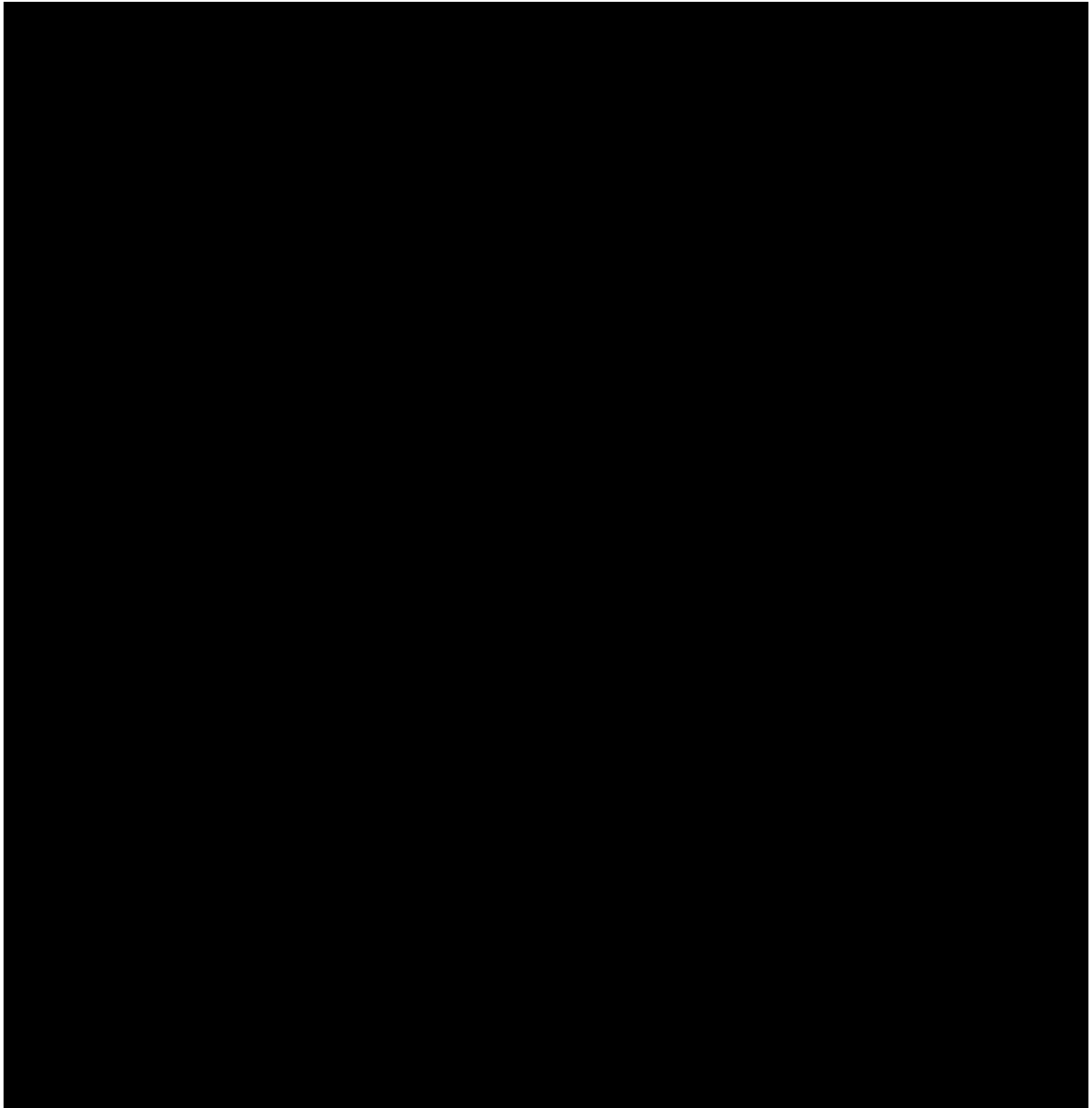
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31. [Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

32. For the above reasons, it is my opinion that Samsung devices with the modified code still literally infringe claim 8[c]. Each is a machine readable medium containing

1 instructions that “determin[e] whether the event object invokes a scroll or gesture operation by  
2 distinguishing between a single input point applied to the touch-sensitive display that is  
3 interpreted as the scroll operation and two or more input points applied to the touch-sensitive  
4 display that are interpreted as the gesture operation.”

## 5 VI. DOCTRINE OF EQUIVALENTS INFRINGEMENT OF THE '915 PATENT

6 33. To the extent that this limitation is not met literally, in my opinion it is met under  
7 the doctrine of equivalents because each of the Samsung devices with the modified code is a  
8 machine readable medium containing instructions that perform steps insubstantially different  
9 from “determining whether the event object invokes a scroll or gesture operation by  
10 distinguishing between a single input point applied to the touch-sensitive display that is  
11 interpreted as the scroll operation and two or more input points applied to the touch-sensitive  
12 display that are interpreted as the gesture operation.”

13 34. I understand that Mr. Gray asserts the doctrine of prosecution history estoppel  
14 prevents me from applying the doctrine of equivalents. I also understand that there are exceptions  
15 to the doctrine of prosecution history estoppel, such as where the reason for the narrowing  
16 amendment was peripheral, or not directly relevant, to the alleged equivalent.

17 35. In my opinion, the reasons for the narrowing amendment were peripheral and not  
18 directly relevant to the alleged equivalent. [REDACTED]

19 [REDACTED]  
20 [REDACTED]  
21 [REDACTED]  
22 [REDACTED]

23 36. Mr. Gray refers to a telephone interview between Apple’s counsel and the  
24 Examiner. (Gray Decl. at ¶ 25.) At that interview, Apple’s counsel authorized an amendment to  
25 the claim language because “the combined [prior art] references fail to teach or suggest creating  
26 an event object that determines whether a user input applied to a touchscreen invokes a scroll  
27 operation or a gesture operation by simply distinguishing between the scroll operation and the  
28 gesture operation *without having to select an object or icon to define the operation.*” Interview

1 Summary, 6/21/2010 (emphasis added). The applicant's reason for amendment was to indicate  
2 that the determination of whether to invoke a scroll or gesture operation was not based on  
3 selecting a predefined object or area.

4 37. Mr. Gray also refers to the Li and Hollemans prior art references in his  
5 Declaration. The examiner distinguished these prior art references because they required the user  
6 to use a predefined area of the touchscreen, [REDACTED]

7 [REDACTED]  
8 [REDACTED]  
9 [REDACTED]  
10 [REDACTED]  
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12 [REDACTED]  
13 [REDACTED]  
14 [REDACTED]  
15 [REDACTED]  
16 [REDACTED]  
17 [REDACTED]  
18 [REDACTED] I analyze the doctrine of equivalents in the following paragraphs.

19 38. It is my opinion that the Samsung products with the modified code perform  
20 substantially the same function, in substantially the same way, to achieve substantially the same  
21 result as the '915 patent.

22 39. First, it is my opinion that the modified code performs substantially the same  
23 function as the recited limitation. The function of the limitation is "*determining* whether the  
24 event object invokes a gesture operation by distinguishing between a single input point applied to  
25 the touch-sensitive surface display that is interpreted as the scroll operation and two or more input  
26 points applied to the touch-sensitive display that are interpreted as the gesture operation." ('915  
27 patent claim 8[c] (emphasis added).) In the context of the '915 patent specification and claim 8,  
28 the function is *determining* whether a scroll or gesture operation should execute based on

1 distinguishing between one or two or more user input points in the event object. The functions  
2 are the same.

3 40. Second, the modified code performs this function in substantially the same way as  
4 in the claim limitation. [REDACTED]

5 [REDACTED]

6 [REDACTED]

7 [REDACTED]

8 [REDACTED]

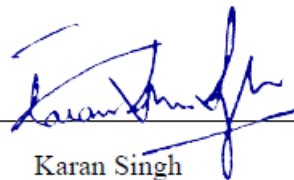
9 [REDACTED]

10 41. Finally, the modified code obtains substantially the same result, *i.e.*, the execution  
11 of either the scroll operation or gesture operation code, depending on whether there is a single  
12 input point or two or more input points.

13 42. For the above reasons, it is my opinion that the Samsung devices with the  
14 modified code continue to infringe claim 8[c] under the doctrine of equivalents as each is a  
15 machine readable medium containing instructions that perform the equivalent of “determining  
16 whether the event object invokes a scroll or gesture operation by distinguishing between a single  
17 input point applied to the touch-sensitive display that is interpreted as the scroll operation and two  
18 or more input points applied to the touch-sensitive display that are interpreted as the gesture  
19 operation.”

20 I declare under penalty of perjury under the laws of the United States of America that the  
21 foregoing is true and correct. Executed on the 9th day of November 2012.

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Karan Singh