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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

ORACLE AMERICA, INC.,)
Plaintiff,)
vs.) No. CV 10-03561 WHA
GOOGLE, INC.,)
Defendant.) VOLUME II
_____)

Videotaped Patent Issues deposition of
JOHN C. MITCHELL, PH.D., Volume 2, taken at
Morrison & Foerster LLP, 755 Page Mill Road,
Palo Alto, California, commencing at 8:18 a.m.,
on Wednesday, September 7, 2011, before
Leslie Rockwood, RPR, CSR No. 3462.

PAGES 271 - 387

<p>1 Q. How can I -- let me ask a question.</p> <p>2 A. Uh-huh.</p> <p>3 Q. If I'm running a virtual machine, am I in the</p> <p>4 runtime of that virtual machine?</p> <p>5 A. That virtual machine is your runtime 10:24:47</p> <p>6 environment.</p> <p>7 Q. Okay. That virtual machine is my runtime</p> <p>8 environment. Let's say I run multiple virtual machines.</p> <p>9 A. Okay.</p> <p>10 Q. Are each separate runtime environments? 10:25:00</p> <p>11 A. If they're separate virtual machines, they</p> <p>12 are separate runtime environments for the codes executed</p> <p>13 on each one.</p> <p>14 Q. Okay. And dexopt is run in a separate</p> <p>15 virtual machine than the virtual machine that actually 10:25:14</p> <p>16 runs the optimized code; correct?</p> <p>17 A. I think that's a different notion of</p> <p>18 separate. When you asked the question before, I was</p> <p>19 thinking of separate applications running in independent</p> <p>20 virtual machines, which is part of the Android 10:25:28</p> <p>21 architecture.</p> <p>22 If you run in the same load configuration and</p> <p>23 the same -- and you depend on information that's only</p> <p>24 available in that runtime environment after loading,</p> <p>25 that, to me, I think is conventionally, and I'm calling 10:25:47</p> <p style="text-align: right;">340</p>	<p>1 Number 1, Volume 2. We are off the record at 10:27 a.m.</p> <p>2 (Recess.)</p> <p>3 THE VIDEOGRAPHER: This is the beginning of</p> <p>4 Disk Number 2, Volume 2. We are back on the record at</p> <p>5 10:38 a.m. 10:38:40</p> <p>6 You may proceed.</p> <p>7 Q. BY MR. KAMBER: Professor Mitchell, I just</p> <p>8 want to ask a few questions to finish up on the '104,</p> <p>9 because we need to move to the '205 patent.</p> <p>10 You would agree with me that the output of 10:38:51</p> <p>11 running dexopt on a .dex file is a .odex file; correct?</p> <p>12 A. I believe that may be one option. When I</p> <p>13 installed the SDK and used this to run code, I didn't</p> <p>14 generate an output like that. It's just part of the</p> <p>15 process of running the application that I compiled and 10:39:18</p> <p>16 translated to Dalvik. And then the run process of</p> <p>17 executing that in the Dalvik Virtual Machine, I believe,</p> <p>18 was what -- where the dexopt got invoked.</p> <p>19 Q. So did you only run this by way of the SDK?</p> <p>20 A. That's the -- an experiment that I did. 10:39:41</p> <p>21 Anytime you run an Android phone, you may also run this,</p> <p>22 so that's another example.</p> <p>23 Q. Let me direct your attention to paragraph 240</p> <p>24 of your report. In the last sentence you talk about</p> <p>25 Android's virtual machine, called the Dalvik Virtual 10:39:59</p> <p style="text-align: right;">342</p>
<p>1 that runtime.</p> <p>2 Q. Let's back up.</p> <p>3 You agreed with me that separate virtual</p> <p>4 machines are separate runtimes; correct?</p> <p>5 A. What I had in mind, and just to clarify, is 10:25:58</p> <p>6 the Android architecture involves separate applications</p> <p>7 running in separate virtual machines. Those are separate</p> <p>8 runtimes.</p> <p>9 Q. So it's the application that defines whether</p> <p>10 it's a runtime, not the fact that it's a separate virtual 10:26:16</p> <p>11 machine instance?</p> <p>12 A. Maybe -- somehow I'm confused by your</p> <p>13 question. Could you just repeat it? I'll try --</p> <p>14 Q. I'm just trying to figure out if under your</p> <p>15 definition of runtime, two separate virtual machines are 10:26:42</p> <p>16 separate runtimes?</p> <p>17 A. Two separately started virtual machines --</p> <p>18 you know, unless one is kind of the restart of the other</p> <p>19 or something like that, are -- you know, independently</p> <p>20 started virtual machines are definitely separate 10:27:08</p> <p>21 runtimes.</p> <p>22 MR. KAMBER: Okay. Let's pause there,</p> <p>23 because we've only got about a minute left on the tape.</p> <p>24 THE WITNESS: Okay.</p> <p>25 THE VIDEOGRAPHER: This is the end of Disk 10:27:17</p> <p style="text-align: right;">341</p>	<p>1 Machine, optimizes the .dex format bytecode into</p> <p>2 optimized .dex bytecode referred to as .odex.</p> <p>3 Do you see that?</p> <p>4 A. Could you just give me the paragraph number,</p> <p>5 again? 10:40:18</p> <p>6 Q. Sure. It's paragraph number 240, the last</p> <p>7 sentence.</p> <p>8 A. Some of these long excerpts makes it hard to</p> <p>9 find.</p> <p>10 Q. It's on paragraph 8 -- or page 83. Excuse 10:40:31</p> <p>11 me.</p> <p>12 A. Okay. Good. That's helpful. It's hard to</p> <p>13 correlate paragraph number and page number easily.</p> <p>14 Okay. 240.</p> <p>15 Okay. This paragraph refers to a format 10:40:54</p> <p>16 called odex. I know there are ways to produce odex files</p> <p>17 that are in odex format. I'm not sure what bearing that</p> <p>18 has on your original question.</p> <p>19 Q. Does dexopt produce odex files?</p> <p>20 A. I don't recall the exact source -- command 10:41:15</p> <p>21 line or other interface to generate odex files. I</p> <p>22 believe that involves an invocation of some portion of</p> <p>23 the dexopt, but it's not clear from this paragraph</p> <p>24 exactly how this works, so --</p> <p>25 Q. Do you recall, based on your analysis of 10:41:55</p> <p style="text-align: right;">343</p>

<p>1 dexopt in general, whether it outputs .odex files?</p> <p>2 A. That, I don't recall. I don't -- you know,</p> <p>3 from my recollection of, for example, running things on</p> <p>4 the SDK and emulator, I don't recall whether there are</p> <p>5 any odex files generated. I believe that the dexopt 10:42:19</p> <p>6 operation then was just part of the steps that are used</p> <p>7 to run the application. There's an appendix A to my</p> <p>8 report that contains some information. I don't know</p> <p>9 whether that's helpful on this point or not.</p> <p>10 Q. How did you run dexopt? 10:42:40</p> <p>11 A. My recollection, at least in that -- those</p> <p>12 experiments, was that it runs as part of the -- as a</p> <p>13 component of the virtual machine. And so in -- whatever</p> <p>14 the human input it is that triggers that process, dexopt</p> <p>15 runs as part of execution on the virtual machine. 10:43:07</p> <p>16 Q. Well, you referred to the SDK before. Did</p> <p>17 you run dexopt as part of the SDK?</p> <p>18 A. What I installed involves the SDK. I think</p> <p>19 the emulator and runtime platform is part of the SDK. In</p> <p>20 any case, my appendix A specifies clearly what I 10:43:31</p> <p>21 installed on my experimental machine, and that</p> <p>22 installation included an emulator for running Android</p> <p>23 applications.</p> <p>24 As I described yesterday, I rebuilt versions</p> <p>25 of the system on that, recompiled them and ran 10:43:56</p> <p style="text-align: right;">344</p>	<p>1 patent specification.</p> <p>2 Q. And the '205 patent specification also</p> <p>3 describes quick instructions; correct?</p> <p>4 A. That's correct.</p> <p>5 Q. And the '205 patent distinguished over the 10:46:23</p> <p>6 JIT compilers and the quick instructions that are</p> <p>7 mentioned in the specification of the '205 patent;</p> <p>8 correct?</p> <p>9 A. Yeah. It's different from, for example, the</p> <p>10 small talk JIT compiler. 10:46:40</p> <p>11 Q. But you accuse the JIT in Android of</p> <p>12 infringing; correct?</p> <p>13 A. Well, there's a component in functionality of</p> <p>14 Android that can be suggested by the summary term JIT.</p> <p>15 The fact that it's -- that I've used JIT to refer to that 10:46:56</p> <p>16 doesn't mean it's the same as the small talk JIT. And</p> <p>17 there are significant differences. I don't know that I</p> <p>18 addressed validity issues here, so I don't know how much</p> <p>19 detail went into that, but it's different in some very</p> <p>20 significant ways. 10:47:21</p> <p>21 Q. Well, let me go back to something you said.</p> <p>22 You said it's a component of Android or a component of</p> <p>23 the JIT. I don't want to misstate your testimony.</p> <p>24 A. Uh-huh.</p> <p>25 Q. What component of the JIT are you 10:47:32</p> <p style="text-align: right;">346</p>
<p>1 instrumented and uninstrumented versions of Android</p> <p>2 completing whatever binaries come as part of the SDK as</p> <p>3 part of that experiment.</p> <p>4 Q. But you don't recall, sitting here today,</p> <p>5 whether dexopt outputs .odex files; correct? 10:44:10</p> <p>6 A. Well, I've described some ways in which -- I</p> <p>7 mean, there is a way to produce odex files, and --</p> <p>8 Q. What is the way?</p> <p>9 A. I don't recall what that is.</p> <p>10 Q. Okay. 10:44:26</p> <p>11 A. But I expect it involves a different -- well,</p> <p>12 typically, in platforms like this, there are different</p> <p>13 ways of causing components to operate different command</p> <p>14 line options and so on. I don't recall the specifics on</p> <p>15 this point for this platform. 10:44:46</p> <p>16 Q. Let's turn to the '205 patent.</p> <p>17 MR. KAMBER: And can I get the '205 patent?</p> <p>18 Q. I suggest you turn in Exhibit 419 to</p> <p>19 paragraph 327 on page 135.</p> <p>20 You would agree with me, Professor Mitchell, 10:45:52</p> <p>21 that the '205 patent distinguishes prior art JIT</p> <p>22 compilers; correct?</p> <p>23 A. Yes, I believe it does. The small talk is an</p> <p>24 example of a compiler that was available in the prior art</p> <p>25 and was mentioned, I believe, explicitly in the '205 10:46:11</p> <p style="text-align: right;">345</p>	<p>1 specifically pointing at as infringing the '205 patent?</p> <p>2 A. You know, I'm not sure how to summarize it</p> <p>3 other than to point to the analysis and say that that</p> <p>4 describes the way in which -- two ways in which the 10:48:01</p> <p>5 patent is infringed. And the components of Android, the</p> <p>6 portions of Android that are mentioned in that analysis,</p> <p>7 including the charts and code that calls or is called by</p> <p>8 the code explicitly cited, I believe infringes the patent</p> <p>9 as I described.</p> <p>10 Q. The -- and I'm trying to keep this at a high 10:48:20</p> <p>11 level for the moment. You referred to a component, and</p> <p>12 I'm just trying to figure out is it the entirety of the</p> <p>13 JIT that you point to as infringing the '205 patent or is</p> <p>14 it a portion, a component thereof?</p> <p>15 A. I'm not sure how to answer that since I'm not 10:48:42</p> <p>16 exactly sure what you mean by the JIT. There's, you</p> <p>17 know, functionality in the Android system, and I've</p> <p>18 explained in the report, and I'm happy to explain</p> <p>19 further, the way in which that infringes.</p> <p>20 My previous statement was just to make it 10:49:04</p> <p>21 clear that if in the report or in discussion one or the</p> <p>22 other of us refers to portions of Android as the JIT,</p> <p>23 that's JIT in a different sense than the small talk JIT</p> <p>24 compiler, for example.</p> <p>25 Q. You also accuse quick instructions of -- 10:49:24</p> <p style="text-align: right;">347</p>