

1 UNITED STATES PATENT AND TRADEMARK OFFICE

2 - - -

3 BEFORE THE TRIAL AND APPEAL BOARD

4 - - -

5 APPLE INC,

6 Petitioner,

7 v.

8 LIMESTONE MEMORY SYSTEMS LLC,

9 Patent Owner.

10 - - -

11 Case IPR2016-01561

12 U.S. Patent No. 6,233,181

13 - - -

14 Video tape deposition of PINAKI

15 MAZUMDER, PH.D, taken on April 27, 2017, at

16 1350 I Street Northwest, Suite 1100,

17 Washington, DC 20005, beginning at 9:03 a.m.,

18 before Valerie D. Owens, a Court Reporter.

19 - - -

20
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22 Philadelphia, Pennsylvania 19103

Veritext Legal Solutions

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1 A P P E A R A N C E S :
 2 ANDREWS KURTH KENYON LLP
 BY: JOHN R. HUTCHINS, ESQUIRE;
 3 ROMAN KHASIDOV, ESQUIRE
 1350 I Street Northwest
 4 Suite 1100
 Washington, DC 20005
 5 (202) 662-3038
 Jhutchins@andrewskurthkenyon.com
 6 Appearing on behalf of Apple Inc.
 7 FITCH EVEN TABIN & FLANNERY LLP
 BY: DAVID A. GOSSE, ESQUIRE
 8 120 South LaSalle Street
 Suite 1600
 9 Chicago, Illinois 60603
 (312) 577-7000
 10 dgosse@fitcheven.com
 Appearing on behalf of Limestone Memory
 11 Systems LLC.
 12
 Also present: Jonathan Perry, Videographer
 13
 14
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 16
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 18
 19
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 22

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1 THE VIDEOGRAPHER: We are now on
 2 the record. Recording will continue until all
 3 parties agree to go off the record. My name
 4 is Jonathan Perry. I represent Veritext
 5 Reporting. Today's date is April 27th, 2017.
 6 The time is approximately 9:03 a.m. We're at
 7 the offices of Andrews Kurth Kenyon, located
 8 at 1350 I Street Northwest in Washington, DC.
 9 The deposition it being taken by counsel for
 10 the Defense in the matter of Apple
 11 Incorporated versus Limestone Memory Systems
 12 LLC, case filed with the US Patent and
 13 Trademark Office before the Patent Trial and
 14 Appeal Board. Case number IPR 2016-1561. The
 15 name of the witness is Pinaki Mazumder.
 16 And would counsel present please
 17 introduce themselves and state whom they
 18 represent.
 19 MR. GOSSE: David Gosse on
 20 behalf of the patent owner, Limestone Memory
 21 Systems LLC.
 22 MR. HUTCHINS: John Hutchins

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1 ---
 2 I N D E X
 3 ---
 4 Testimony of: PINAKI MAZUMDER, PH.D
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 7 E X H I B I T S

 8

EXHIBIT	DESCRIPTION	PAGE
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11 Exhibit 3	Hidaka Patent	87
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15 Exhibit 7	IEEE Journal of Solid-State Circuits, A Flexible Redundancy Technique for High-Density DRAM's	213
16 Exhibit 8	Fault-Tolerance and Reliability Techniques for High-Density Random-Access Memories	213
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1 from Andrews Kurth Kenyon presenting Apple and
 2 with me is Roman Khasidov.
 3 THE VIDEOGRAPHER: The court
 4 reporter is Valerie Owens, also with Veritext.
 5 Would you please swear in the witness.
 6 THEREUPON:
 7 PINAKI MAZUMDER, PH.D,
 8 was called as a witness and, having been first
 9 duly sworn and responding "I do," was examined
 10 and testified as follows:
 11 DIRECT EXAMINATION
 12 BY MR. GOSSE:
 13 Q. Good morning, Dr. Mazumder.
 14 A. Okay. Good morning.
 15 Q. You understand that you're here
 16 for your deposition today?
 17 A. Yes.
 18 Q. Okay. Have you ever been
 19 deposed before, sir?
 20 A. Yes.
 21 Q. Okay. Then you probably are
 22 familiar with the process. I'm going to cover

<p style="text-align: right;">Page 6</p> <p>1 a few ground rules, just in case. You're 2 entitled obviously to a fair question. I'll 3 be asking you questions all day. 4 A. Yes. 5 Q. If you don't understand the 6 question, let me know and we'll try to 7 rephrase it or work out the misunderstanding 8 so that we can come to an answer that is as 9 accurate as possible. Do you understand? 10 A. Sure. 11 Q. Okay. And in the course of 12 answering questions that I ask, if you could 13 please respond with something verbal, like a 14 yes or a no. Avoid head nods or head shakes 15 and avoid any sort of uh-huhs or ah-huhs, 16 because the court reporter won't be able to 17 accurately transcribe those and indicate 18 whether you meant yes or no. Do you 19 understand? 20 A. I understand. 21 Q. Okay. And we'll try avoid 22 talking over each other. I'll ask you a</p>	<p style="text-align: right;">Page 8</p> <p>1 an expert witness on behalf of Apple. Is that 2 correct? 3 A. Yes. 4 Q. Okay. Have you worked with 5 Apple any other times? 6 A. No. 7 Q. And did you meet with attorneys 8 to prepare for today's deposition? 9 A. I met attorneys yesterday. 10 Q. Okay. How long did you speak 11 with them? 12 A. I came here after 10:30 -- 13 around 10:30 or so and we are there probably 14 around six o'clock. 15 Q. Who all did you meet with in 16 preparation for today's deposition? 17 A. John and Roman. 18 Q. Okay. Did you do anything else 19 to prepare for today's deposition? 20 A. I reviewed the materials for few 21 days before coming over here. 22 Q. Which materials did you review?</p>
<p style="text-align: right;">Page 7</p> <p>1 question and you can answer it, that way we 2 can get an accurate transcript from the -- the 3 court reporter. 4 A. Okay. 5 Q. Does that work for you? 6 A. Sure. 7 Q. Okay. Great. Could you spell 8 your name for the court reporter, please. 9 A. Pinaki Mazumder is my name, that 10 way it is pronounced; and spelling is 11 P-i-n-a-k-i and then last name is 12 M-a-z-u-m-d-e-r. 13 Q. Dr. Mazumder, are you employed? 14 A. Yes. 15 Q. Where do you work, sir? 16 A. I work at the University of 17 Michigan. 18 Q. How long have you been working 19 there? 20 A. I joined there in 1987, 21 September. 22 Q. Okay. And you're here today as</p>	<p style="text-align: right;">Page 9</p> <p>1 A. The apple petition. 2 Q. Okay. 3 A. Then Limestone's reply, as the 4 well as the other materials, like the prior 5 arts, then both -- the prior arts that we 6 asserted in the petition, as well as the other 7 materials like -- which we consider in the 8 list of materials. We consider -- 9 THE REPORTER: Consider what 10 materials? 11 THE WITNESS: The list of 12 materials that we used in preparing the 13 declaration -- 14 BY MR. GOSSE: 15 Q. Okay. 16 A. -- and -- 17 Q. Did you review any material that 18 is not cited as an exhibit in this matter? 19 MR. HUTCHINS: Well, if you 20 know -- if you know what's been cited as an 21 exhibit. 22 THE WITNESS: Yes. If you show</p>

<p style="text-align: right;">Page 10</p> <p>1 me the exhibits, I will know, but definitely 2 the things that has been referenced in the 3 declaration in the footnote or in the list of 4 materials considered. I did look into them. 5 Especially there was -- in footnote of my 6 declaration Horiguchi's paper in 1997. So I 7 did review that, as well as the -- some of the 8 references which he used to describe some 9 inter subarray replacement to see that -- 10 there's one reference 256 megabit DRAM in 11 1996. So I did look into that. 12 And, similarly, for Sukegawa, I 13 think he has a series of patents on this 14 particular concept. So I also looked into 15 other patents a little bit, but mostly I 16 concentrated on 0430 patent, which we have 17 used in the prior art. 18 BY MR. GOSSE: 19 Q. Okay. So in terms of material 20 that's not cited in your declaration, am I 21 correct that you reviewed several documents, 22 several papers that are cited in Sukegawa's</p>	<p style="text-align: right;">Page 12</p> <p>1 if I may. The -- you reviewed several papers 2 that are cited in the Horiguchi article, 3 correct? 4 A. Not several. There are two of 5 them which are related to inter subarray 6 replacement. 7 Q. Okay. One of those you 8 mentioned was a 256 megabit DRAM paper. 9 A. That's right. 10 Q. What was the other one? 11 A. I cannot recall, but that's also 12 like inter subarray replacement technique. 13 This 256 megabit DRAM 1996 paper seemed more 14 closer to this 181 patent. 15 Q. Do you know the author of that 16 paper offhand? 17 A. Actually, it is a -- you know, 18 at that time IBM, then Toshiba and Simmons, 19 they are working on 256 megabit DRAM manuals. 20 So it was a Japanese author, I think, Kitahara 21 (phonetic) probably. I'm not hundred percent 22 sure. If you have a copy of the Horiguchi</p>
<p style="text-align: right;">Page 11</p> <p>1 1997 article? 2 A. I wouldn't say several. As a 3 matter of fact, Sukegawa had filed three 4 patents at the same time almost. I think 040 5 is one of them and it's complementary one is 6 called 850, some number of this, ends with 7 850. And then he had also a month before, I 8 suppose he filed 394 patent. So I just very 9 cursory looked into to see that, you know, I 10 mean how they complement with this concept 11 related to any mapping. 12 Q. Okay. 13 MR. HUTCHINS: I'm sorry. Did 14 you -- were you asking about Horiguchi or 15 Sukegawa? 16 MR. GOSSE: I -- I misspoke, 17 Counsel. I apologize. 18 MR. HUTCHINS: That's okay. 19 There may have been a little bit of confusion 20 about what he was asked -- 21 BY MR. GOSSE: 22 Q. Yeah. So let me just rephrase,</p>	<p style="text-align: right;">Page 13</p> <p>1 1997 paper, I can point that out. 2 Q. Sure. We'll -- we'll jump into 3 that later, if that's okay. 4 A. Okay. 5 Q. In preparing for the deposition, 6 did you speak with anybody other than the 7 attorneys that are here with us today? 8 A. Yesterday I met them for the 9 first time and we discussed over different 10 things. My -- 11 MR. HUTCHINS: He's just asking 12 if you spoke with -- 13 THE WITNESS: Right. Right. 14 MR. HUTCHINS: -- anyone other 15 than the attorneys. 16 THE WITNESS: Right. I'm just 17 trying to recollect. I think probably -- 18 today is Thursday. Tuesday, I suppose another 19 attorneys just explained to me what a 20 deposition will be like. I mean, the 21 logistics and things like that. 22 BY MR. GOSSE:</p>

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1 Q. That was another attorney from
2 Andrews Kurth?
3 A. Yeah. Rose, yes.
4 Q. Okay. Sure.
5 A. And Roman was also on the phone.
6 Q. Okay. In the course of your
7 work on this case, have you spoken to lawyers
8 for any of the other defendants, any of the
9 other defendants in the district court
10 litigation?
11 A. Can you explain. What do you
12 mean by other defendants?
13 Q. Have you spoken with lawyers
14 from Micron Technology?
15 A. No, I don't know them.
16 Q. Okay. Have you spoken with any
17 lawyers from Acer --
18 A. No.
19 Q. -- Dell --
20 A. No.
21 Q. -- HP --
22 A. No.

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1 Q. -- Kingston --
2 A. No.
3 Q. -- Lenovo --
4 A. No.
5 Q. -- or OCZ Storage Solutions?
6 A. No.
7 Q. Okay. And in the course of your
8 work overall on this case, have you reviewed
9 any documents other than the ones cited in
10 your declaration?
11 A. While writing the declaration, I
12 did read quite a -- things to basic relate to
13 the 181 patent, Sukegawa and other things, but
14 of late, no.
15 Q. Okay. Did any of those other
16 documents inform your reasoning or your
17 opinions?
18 A. Well, I have written a book on
19 DRAM where fault tolerance is the main theme
20 and there I discussed about Horiguchi's 1991
21 paper and all. So I did reference to --
22 looked into my own book, actually. And then

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1 the two references I have provided in the
2 declaration, I think the footnote eight and
3 nine, both are authored by Horiguchi. One is
4 1997 paper, the other one is part of a chapter
5 of a book that he wrote with the Kiyoo Itoh,
6 so I did look into that.
7 Q. Okay. And did you speak with
8 anybody else -- outside of attorneys in
9 preparing --
10 A. No.
11 Q. -- your declaration?
12 A. No.
13 Q. Okay. The court reporter has
14 marked Exhibits 1 and 2. She'll put those in
15 front of you.
16 MR. HUTCHINS: Thank you.
17 (Limestone Exhibit 1 and Exhibit
18 2 were marked for Identification.)
19 BY MR. GOSSE:
20 Q. Exhibit 1 is your declaration in
21 this matter. Do you recognize that document?
22 A. Yes. It appears to be the same

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1 one which I provided with my signature.
2 Q. Okay. And Exhibit 2 is also in
3 front of you. That is your curriculum vitae.
4 Do you recognize that document?
5 A. Yes.
6 Q. Okay. And does your -- does
7 this declaration, Exhibit 1, summarize your
8 opinions in this case?
9 A. Yes.
10 Q. Okay.
11 A. Based on the facts I had at that
12 time and the knowledge at that time, yes.
13 Q. Okay. Other relevant facts or
14 knowledge that you've since learned that's not
15 cited in here?
16 A. No. I just mentioned that what
17 are additional materials I just looked into.
18 That's all.
19 Q. Okay. Dr. Mazumder, when were
20 you first approached by Andrews Kurth
21 regarding this matter?
22 A. When I was first contacted or --

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