1 UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD
2

AMAZON.COM, INC.,)
3 AMAZON.COM SERVICES)
LLC,) CASE NO.:
4) IPR2024-00604
Petitioner,)
5) U.S. Patent No.
VS.) 10,536,714
6)
NOKIA TECHNOLOGIES OY,)
7)
Patent Owner.)
8

UNITED STATES PATENT AND TRADEMARK OFFICE
9 BEFORE THE PATENT TRIAL AND APPEAL BOARD

10 AMAZON.COM, INC.,)
AMAZON.COM SERVICES)
11 LLC,)
) CASE NO.:
12 Petitioner,) IPR2024-00605
)
13 VS.) U.S. Patent No.
) 10,536,714
14 NOKIA TECHNOLOGIES OY,)
)
15 Patent Owner.)

16

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17 ORAL AND REALTIMED DEPOSITION OF
CHARLES D. CREUSERE
18 JANUARY 20, 2025

19

JOB NO.: 567226
20

PAGES: 1 - 132
21

REPORTED BY: ANNETTE PELTIER
22

1 ORAL, REALTIMED DEPOSITION OF CHARLES D.
2 CREUSERE, produced as a witness at the instance
3 of the Patent Owner, and duly sworn, was taken in
4 the above-styled and numbered cause on
5 January 20, 2025, from 8:55 a.m. to 11:54 a.m.,
6 before Annette Peltier, CSR, Texas Certified
7 Realtime Reporter, in and for the State of Texas,
8 reported by machine shorthand, at the Courtyard
9 by Marriott, Las Cruces, 456 E. University
10 Avenue, Las Cruces, New Mexico, 88005 pursuant to
11 the United States Patent and Trademark Office
12 Rules of Civil Procedure and the provisions
13 stated on the record or attached hereto.
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22

Nokia Exhibit 2010, p. 2
Amazon.com v. Nokia
IPR2024-01503

1 A P P E A R A N C E S

2

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Nokia Exhibit 2010, p. 3
Amazon.com v. Nokia
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Nokia Exhibit 2010, p. 4
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1 THE COURT REPORTER: Do you need a 08:55:18
2 copy of today's deposition? 08:56:45
3 MR. LIANG: I don't. 08:56:47
4 MR. VERBONCOEUR: Real-time? 08:59:01
5 THE COURT REPORTER: Yes, here you 08:59:04
6 go. 08:59:07
7 CHARLES CREUSERE, 09:00:37
8 Having been first duly sworn, testified upon his 09:00:37
9 oath as follows: 09:00:40
10 EXAMINATION 09:00:40
11 BY MR. VERBONCOEUR: 09:00:41
12 Q. Good morning, Doctor. 09:00:41
13 A. Good morning. 09:00:49
14 Q. My first question is: How do you 09:00:49
15 pronounce your last name? 09:00:51
16 A. Creusere. 09:00:52
17 Q. Creusere. Okay. 09:00:53
18 As someone with a long last name, I 09:00:54
19 can sympathize, Dr. Creusere. 09:00:59
20 I take it this is not your first 09:01:00
21 deposition? 09:01:02
22 A. No. 09:01:02

Nokia Exhibit 2010, p. 5
Amazon.com v. Nokia
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1 Q. How many times have you been deposed? 09:01:03
2 A. Roughly 20. 09:01:05
3 Q. Okay. So you generally know the process 09:01:06
4 of me asking you questions, you answering the 09:01:08
5 questions unless your counsel instructs not to? 09:01:11
6 A. Yes, I do. 09:01:14
7 Q. Will you agree if you don't understand one 09:01:15
8 of my questions to let me know so that I can 09:01:17
9 rephrase it? 09:01:20
10 A. I certainly will. 09:01:21
11 Q. What did you do to prepare for today's 09:01:22
12 deposition? 09:01:25
13 A. I reviewed my declarations. I reviewed 09:01:26
14 the supporting references related to my 09:01:30
15 declarations, the exhibits. I reviewed the PTAB 09:01:35
16 decision to institute. I reviewed the patent 09:01:41
17 owner's preliminary response. 09:01:46
18 I think -- I think that's about -- and 09:01:52
19 of course -- and, of course, the patents-in-suit, 09:01:55
20 the '714 patent, as well. 09:01:57
21 Q. And I see that you brought a number of 09:01:59
22 documents? 09:02:02

Nokia Exhibit 2010, p. 6
Amazon.com v. Nokia
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1 A. Yes. 09:02:03
2 Q. Can you let me know what those documents 09:02:04
3 are that you brought? 09:02:06
4 A. These are all clean copies, as well. 09:02:06
5 They're not marked. 09:02:09
6 This first folder contains both of my 09:02:10
7 declarations, as well as the decision to 09:02:12
8 institute both of the IPRs; and the second folder 09:02:14
9 contains a copy of the '714 patent, a copy of 09:02:19
10 Brushare (phonetics), a copy of Karczewicz, a 09:02:24
11 copy of Rusert -- 09:02:24
12 (Reporter Clarification.) 09:02:24
13 THE WITNESS: Rusert, R-U-S-E-R-T. 09:02:26
14 Karczewicz, I don't even want to try to spell. 09:02:30
15 A. But Lin, a copy of Lin; a copy of the 09:02:33
16 Exhibits 17, 108, and 109 relating to Nakamura, 09:02:39
17 Exhibit 1 -- 110 relating to WD40, the exhibits 09:02:46
18 from my declaration, and Exhibit -- excerpts of 09:02:51
19 Exhibit 1015, '833 file history, and then the 09:02:57
20 patent owner Exhibit 2007 Tai. 09:03:03
21 Q. Okay. Thank you for that. 09:03:06
22 I want to ask you something about your 09:03:08

Nokia Exhibit 2010, p. 7
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1 declarations. 09:03:11
2 There are two IPRs here, one 604, one 09:03:12
3 605? 09:03:17
4 A. That is correct, yes. 09:03:17
5 Q. And you submitted a declaration in both of 09:03:18
6 them? 09:03:21
7 A. That is correct, as well. 09:03:22
8 Q. And I'm hoping to streamline things so 09:03:23
9 that we can refer to just one of those two 09:03:27
10 declarations instead of having to look for the 09:03:29
11 information we're seeking in both declarations. 09:03:29
12 Would you agree that the opinions in 09:03:32
13 both are substantially similar? 09:03:34
14 A. I would agree that they are substantially 09:03:35
15 similar, and I agree that -- that simplifying 09:03:37
16 this by focusing on one is a good idea. 09:03:39
17 Q. Okay. Thank you. 09:03:42
18 Did you meet with counsel to prepare 09:03:43
19 for your deposition? 09:03:44
20 A. I did. 09:03:45
21 Q. For how long did you meet with counsel? 09:03:46
22 A. I met with counsel for relatively short 09:03:48

Nokia Exhibit 2010, p. 8
Amazon.com v. Nokia
IPR2024-01503

1 meetings on Thursday and Friday via Zoom, and 09:03:52
2 then I met with counsel in person yesterday for 09:03:56
3 most of the day. 09:03:58
4 Q. Did you meet with anybody else other than 09:04:00
5 counsel to prepare for today's deposition? 09:04:02
6 A. I met with -- well, as part of, at least, 09:04:05
7 one or two of the meetings, there was another 09:04:10
8 lawyer involved, as well. 09:04:13
9 Q. Other than lawyers, did you meet with 09:04:14
10 anybody to prepare for today's deposition? 09:04:17
11 A. No, I did not meet with anybody other than 09:04:18
12 lawyers. 09:04:20
13 Q. Okay. Other than the exhibits that you 09:04:20
14 just listed off from the two binders in front of 09:04:24
15 you, did you consult any other documents to 09:04:27
16 prepare for today's deposition? 09:04:29
17 A. No, I can't think of any other documents I 09:04:44
18 consulted. 09:04:48
19 Q. Okay. Thank you. 09:04:48
20 MR. VERBONCOEUR: And I'd like to 09:04:49
21 introduce an exhibit now, which should not be a 09:04:50
22 surprise, the '714 patent. 09:04:54

Nokia Exhibit 2010, p. 9
Amazon.com v. Nokia
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1 THE WITNESS: Okay. 09:04:58
2 (Whereupon Exhibit Number 1 was 09:04:58
3 marked for identification.) 09:04:58
4 MR. VERBONCOEUR: Let's take a 09:04:58
5 break. 09:05:29
6 (Break taken from 9:05 a.m. to 09:05:29
7 9:06 a.m.) 09:06:24
8 Q. (BY MR. VERBONCOEUR) Okay. So you have a 09:06:25
9 copy of the '714 patent? 09:06:27
10 A. Yes, I have got the marked copy. 09:06:28
11 Q. Okay. So, Dr. Creusere, you have what's 09:06:40
12 been marked as Exhibit 1 in front of you. 09:06:42
13 Do you agree that's the '714 patent 09:06:44
14 that's the issue of today's deposition? 09:06:46
15 A. Yes, it certainly appears to be. 09:06:50
16 Q. Thank you. 09:06:53
17 I'd like to ask you about your 09:06:54
18 interpretation of the claims of the '714 patent. 09:06:56
19 And if you could, please turn with me 09:06:59
20 to claim 23 of the '714 patent. 09:07:01
21 A. (Complying.) 09:07:03
22 Okay, I'm looking at 23. 09:07:15

Nokia Exhibit 2010, p. 10
Amazon.com v. Nokia
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1 Q. Dr. Creusere, you've read claim 23 before? 09:07:17
2 A. Yes, I have. 09:07:20
3 Q. Okay. And I'd like to ask about your 09:07:21
4 understanding of some of the technical terms. 09:07:23
5 And I know that you opine on some of 09:07:25
6 these in your declaration; so if you need to see 09:07:27
7 that, let me know. 09:07:30
8 Let's talk about what a spatial motion 09:07:31
9 vector prediction candidate is. 09:07:35
10 What is that? 09:07:36
11 A. Well, I mean, I think it is probably 09:07:37
12 worth -- just because I give -- you know, I give 09:07:40
13 a formal definition in my -- in my declaration, I 09:07:43
14 think I'll read that first, then we can discuss 09:07:48
15 it. 09:07:50
16 I'm sorry, which version -- we decided 09:07:51
17 we're going to focus on one version of my 09:07:54
18 declaration. 09:07:56
19 Which one were we doing? 09:07:56
20 Q. Which would you prefer? The 604, that's 09:07:58
21 the first -- 09:08:02
22 A. One of them is the first -- so let's see. 09:08:02

Nokia Exhibit 2010, p. 11
Amazon.com v. Nokia
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1 The 604 is the first. 09:08:05
2 Q. Okay. 09:08:06
3 A. That's near the front, so that one's okay. 09:08:06
4 Q. Yes. 09:08:09
5 MR. VERBONCOEUR: So for the 09:08:09
6 record, Dr. Creusere's looking at his 604 09:08:10
7 declaration for purposes of answering this 09:08:13
8 question. 09:08:16
9 A. Okay. So... 09:08:16
10 Okay. So in the claim construction 09:08:19
11 section around paragraph 62, I discuss spatial 09:08:22
12 motion vector prediction candidate. 09:08:27
13 And just -- just to read what I've 09:08:34
14 written, based on my review of the claims and 09:08:37
15 specifications of the '714 patent, it is my 09:08:39
16 opinion that a person of ordinary skill in the 09:08:42
17 art -- "POSITA" is what it actually says -- would 09:08:45
18 have understood a "spatial motion vector 09:08:48
19 prediction candidate" to mean a candidate motion 09:08:50
20 vector obtained from one or more 09:08:54
21 previously-encoded blocks. 09:08:58
22 So that is the basic definition I 09:08:59

Nokia Exhibit 2010, p. 12
Amazon.com v. Nokia
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1 give. 09:09:00
2 I can go on here, if you'd like. 09:09:01
3 Q. Okay. A spatial motion vector prediction 09:09:03
4 candidate is different from a temporal motion 09:09:07
5 vector prediction candidate? 09:09:10
6 A. Yes. 09:09:11
7 A spatial motion vector prediction 09:09:12
8 candidate is a prediction based on blocks in the 09:09:15
9 current frame -- "the current" being at the 09:09:18
10 current time. 09:09:21
11 A temporal motion vector prediction 09:09:22
12 candidate is a prediction candidate based on 09:09:26
13 blocks in a frame that is neighboring in time but 09:09:29
14 not the current frame. 09:09:32
15 So it could be a frame from a previous 09:09:33
16 time, or it could be a frame from a future time. 09:09:35
17 Q. Okay. And when we're decoding a current 09:09:38
18 block, obviously that block doesn't have a motion 09:09:41
19 vector yet. 09:09:43
20 I mean, the purpose of motion vector 09:09:44
21 predictions is to inform what motion vector it 09:09:45
22 will ultimately choose for the current block? 09:09:48

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Amazon.com v. Nokia
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1 A. The current block is the block that we are 09:09:51
2 currently encoding; so it, indeed, does not have 09:09:53
3 a motion vector prediction candidate yet or a 09:09:57
4 motion vector of any sort. It has not been 09:10:01
5 expressed yet. 09:10:04
6 Q. And motion vector prediction candidates, 09:10:05
7 for purposes of the '714 patent, they come from 09:10:07
8 blocks other than the current block; and you know 09:10:10
9 whether it's in a different block in the current 09:10:13
10 frame or a different block in -- in a previous 09:10:16
11 frame based on whether it's spatial or temporal? 09:10:19
12 A. So again, motion vector prediction 09:10:25
13 candidates can come from previous frames or even 09:10:30
14 future frames, which -- which is actually 09:10:33
15 allowable because you can delay the processing of 09:10:36
16 the current frame -- and/or they can come from 09:10:39
17 the current frame; but if they come from the 09:10:44
18 current frame, they have to come from a block 09:10:47
19 that has already been encoded because -- and that 09:10:49
20 also actually has spatial -- that actually has 09:10:53
21 motion information associated with it; otherwise, 09:10:57
22 you can't use it for prediction. 09:10:59

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1 Q. And for clarity, I meant in 09:11:01
2 decoding order -- 09:11:01
3 A. Well -- 09:11:01
4 Q. -- rather than display order. 09:11:04
5 A. Okay. 09:11:06
6 Q. But I understand your point, that with -- 09:11:06
7 by "prediction," for example, you might have a 09:11:09
8 future display that's used for prediction. 09:11:12
9 What does it mean for a motion vector 09:11:17
10 to be a candidate motion vector? 09:11:20
11 A. In this context, in the context of the 09:11:28
12 '714 patent, what that means is that -- so what 09:11:30
13 the '714 patent is trying to accomplish in all of 09:11:36
14 its claims is it's trying to come up with a 09:11:38
15 prediction for the motion in the current block. 09:11:42
16 And that prediction is going to -- the 09:11:45
17 prediction process is going to select -- 09:11:50
18 ultimately, for each block, once the prediction 09:11:56
19 process is completed, it will have created a list 09:11:59
20 of prediction -- vector prediction candidates 09:12:03
21 when the process is complete, and then what will 09:12:09
22 happen is the encoder will select from that list 09:12:11

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Amazon.com v. Nokia
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1 one of the prediction motion vector candidates, 09:12:17
2 and that will become the predicted motion vector 09:12:21
3 for that block. 09:12:24
4 Q. Doctor, the answer you gave is in the 09:12:30
5 context of the perspective of the encoding or 09:12:32
6 decoding after a list has been created but before 09:12:38
7 the motion vector prediction list is created. 09:12:40
8 How does one know whether a motion 09:12:42
9 vector is a candidate or not? 09:12:45
10 MR. LIANG: Objection to form. 09:12:53
11 A. I think that depends on exactly the 09:12:56
12 procedure used. 09:12:59
13 Different procedures could be used to 09:13:00
14 come up with -- with your candidates, but the 09:13:03
15 point is that -- that there will be some number 09:13:06
16 of candidates, right, depending on -- no matter 09:13:10
17 what your procedure is, to select the 09:13:14
18 candidates -- there will be some number of 09:13:16
19 candidates. 09:13:18
20 You will have to evaluate those 09:13:19
21 candidates in some manner. When you're done with 09:13:22
22 the evaluation process, you'll have a final list 09:13:24

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1 of prediction motion vector candidates; so there 09:13:28
2 will be some candidates that might be on the list 09:13:32
3 and then perhaps, you know, not end up on the 09:13:34
4 final list. 09:13:37
5 But when the process is complete, 09:13:38
6 you'll have a final list. Then you will select 09:13:40
7 from that list of candidates a specific motion 09:13:42
8 vector prediction for that block. 09:13:47
9 THE COURT REPORTER: I'm sorry, 09:13:47
10 can we take a break? I am having an issue. 09:13:47
11 MR. VERBONCOEUR: Yes, of course. 09:13:47
12 (Break taken from 9:14 a.m. to 09:13:47
13 9:20 a.m.) 09:20:54
14 Q. (BY MR. VERBONCOEUR) All right. Welcome 09:20:56
15 back, Doctor. 09:20:57
16 A. Thank you. 09:20:58
17 Q. Okay. So, Doctor, I'd like to direct your 09:20:58
18 attention to Figure 9 of the '714 patent. 09:21:01
19 Please let me know when you're there. 09:21:03
20 A. Yes, I'm looking at it now. 09:21:05
21 Q. Okay. And -- and we just talked about 09:21:07
22 spatial motion vector prediction candidates and 09:21:10

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1 temporal motion vector prediction candidates, and 09:21:13
2 I -- I want to get your take on Figure 9. 09:21:15
3 So will you agree that the block 09:21:17
4 labeled "900" in Figure 9 is referring to a block 09:21:18
5 of pixels being encoded or decoded? 09:21:22
6 A. Yes. 09:21:26
7 That's -- that's -- that's the -- the 09:21:27
8 current block, the block being encoded and 09:21:27
9 decoded. 09:21:31
10 Q. And then there are a number of other 09:21:31
11 blocks, and -- and they have inside of them, 09:21:33
12 "A0," "A1," "B0," "B1," and "B2"? 09:21:36
13 A. Uh-huh, yes. 09:21:39
14 Q. And in Figure 9 of the '714 patent, those 09:21:39
15 blocks that have the different letter and number 09:21:42
16 combinations have the labels "901" through "905." 09:21:45
17 A. Yes, they do have those labels. 09:21:49
18 Q. And -- and the blocks 901 to 905, those 09:21:51
19 are neighboring blocks around block 900 in the 09:21:55
20 current frame. 09:22:00
21 Do you agree with that? 09:22:01
22 A. Yes. Those are reference blocks in the 09:22:02

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1 current frame. 09:22:05
2 Q. And then the labels "A0," "A1," "B0," 09:22:07
3 "B1," and "B2," those refer to motion vectors 09:22:12
4 that would be associated with those blocks 901 09:22:16
5 through 905. 09:22:20
6 A. I have to disagree with that. 09:22:31
7 If we go to the text describing this, 09:22:33
8 for example, column 16, line 8, it states, for 09:22:36
9 example, "if the spatial motion" vector 09:22:44
10 "prediction candidate is the block B1." 09:22:47
11 So I think that it's -- the -- you 09:22:49
12 know, they're -- they're referring to -- 09:22:52
13 referring to the block B1. 09:22:54
14 So in the block -- yeah. So it's a 09:22:56
15 little bit indeterminant, right, because they're 09:23:05
16 saying the spatial motion vector prediction 09:23:06
17 candidate is the block B1, but -- but B1 -- a 09:23:09
18 block is not a spatial motion vector prediction 09:23:12
19 candidate, so a little iffy there. 09:23:15
20 Q. The way that you read the text at column 09:23:18
21 16, starting at line 8, referring to the spatial 09:23:21
22 motion vector prediction candidate, block B1, is 09:23:24

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1 that "B1" there refers to both the location of a 09:23:27
2 block of pixels, but there's also some associated 09:23:31
3 motion vector that the block B1 that was 09:23:34
4 previously encoded or decoded might have. 09:23:37
5 A. That -- that is -- that -- that appears to 09:23:40
6 be implied -- implied, but I'm just pointing out 09:23:43
7 that there is a -- that it's not totally clear 09:23:45
8 from -- from the text here that -- but I do agree 09:23:48
9 that that appears to be the implication. 09:23:51
10 Q. In looking back at Figure 9 and thinking 09:23:53
11 about this from the knowledge of a person of 09:23:56
12 skill in the art, would you agree with me that a 09:23:59
13 person of skill in the art would understand in 09:24:02
14 Figure 9 that whether we call them 901 through 09:24:04
15 905 or A0 through B2, there are a number of 09:24:08
16 blocks that are previously encoded or decoded 09:24:12
17 before we get to current block 900? 09:24:14
18 A. I believe that a person of ordinary skill 09:24:17
19 in the art would look at this and they would 09:24:20
20 understand that -- that these A0, A1, B1, B0, B2 09:24:22
21 were all blocks that -- were all -- all 09:24:30
22 corresponded to blocks that could potentially 09:24:36

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1 have motion vectors available for use in the 09:24:39
2 prediction process. 09:24:45
3 Q. A person of skill in the art knows what 09:24:46
4 raster scan order is? 09:24:48
5 A. A person of skill in the art definitely 09:24:51
6 knows what raster scan order is. 09:24:53
7 Q. And you'd agree that raster scan order is 09:24:54
8 a typical video coding process used in encoders 09:24:56
9 or decoders that starts at the -- the top left of 09:25:00
10 the frame and then proceeds to process blocks 09:25:02
11 across and then goes down a row and then 09:25:05
12 continues to process the blocks? 09:25:07
13 A. The raster scan is -- is the most commonly 09:25:09
14 used scanning order, certainly. 09:25:12
15 Q. Okay. And a person of skill in the art 09:25:14
16 looking at Figure 9 would understand that these 09:25:16
17 blocks that include the labels inside of them, 09:25:19
18 A0, A1, B0, B1, B2, could have been previously 09:25:24
19 decoded according to some raster scan order? 09:25:29
20 A. A person of ordinary skill in the -- skill 09:25:31
21 in the art would understand that that -- that 09:25:34
22 that is possible, that they -- that they could 09:25:34

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1 have been previously encoded in the encoder and 09:25:39
2 obviously available, previously decoded in the 09:25:45
3 decoder. 09:25:48
4 However, for example, in a pure raster 09:25:49
5 scan, it is quite likely that block A0, which is 09:25:52
6 below and to the right of the current block, 09:25:56
7 might not be available; but, again, there are 09:25:58
8 many scanning patterns used and, hence, the -- 09:26:02
9 the -- the block layout given in Figure 9. 09:26:07
10 Q. All right. Are you familiar with the 09:26:12
11 H.265 standard? 09:26:15
12 A. I'm pretty familiar with it, yes. 09:26:16
13 Q. And are you familiar with the variable 09:26:18
14 block sizes in the H.265 standard? 09:26:21
15 A. Yes, I'm familiar with the variable block 09:26:22
16 standards [sic] in the H.265 standard. 09:26:26
17 Q. And are you also familiar with the process 09:26:26
18 of -- of decoding specified in the H.265 standard 09:26:28
19 that can sometimes take those variable block 09:26:34
20 sizes and lead to a situation where the block 09:26:36
21 labeled "A1" can be decoded before the block 09:26:39
22 labeled "900" would be decoded? 09:26:42

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1 A. I -- certainly. I mean, there -- there -- 09:26:47
2 there are -- there are -- there are -- with the 09:26:50
3 quadtree decomposition that's used in H.265, 09:26:55
4 there are many permutations as to which blocks 09:26:58
5 have already -- would have already been 09:27:02
6 encoded -- sorry -- would have already been 09:27:05
7 encoded or decoded in -- in the scanning order. 09:27:08
8 So there are a lot of permutations. 09:27:10
9 Q. I think -- I think we agree on this; but, 09:27:12
10 you know, at a very high level, the problem that 09:27:16
11 a person of skill in the art would understand the 09:27:18
12 '714 patent to address is that we -- we don't 09:27:20
13 know what vector we should use for block 900 if 09:27:24
14 we're an encoder or a decoder. 09:27:27
15 A. I don't think that's exact -- entirely 09:27:32
16 accurate because we could always simply encode 09:27:34
17 block 900 with its own unique motion vector. 09:27:41
18 The point -- the point of the '714 09:27:45
19 patent is, rather than spend the -- spend the 09:27:49
20 bits, right, expend the bits to encode a motion 09:27:52
21 vector for block 900, it might be more efficient 09:27:57
22 to, instead, predict the motion for block 900. 09:28:01

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1 And the '714 patent is focused on 09:28:07
2 coming up with a good prediction for the block 09:28:11
3 900. 09:28:15
4 Q. That's fair, and that's a more precise way 09:28:15
5 of putting it. 09:28:19
6 So -- so let's look at this from the 09:28:19
7 perspective of the decoder. 09:28:19
8 The decoder knows that block 900 has 09:28:20
9 been coded with some form of motion-compensated 09:28:23
10 prediction technique; but I think you would agree 09:28:27
11 with me that when the decoder reaches block 900, 09:28:29
12 the decoder doesn't know what motion vector to 09:28:33
13 apply at that point. 09:28:35
14 A. The decoder does not know what motion 09:28:36
15 vector to apply at the start of the process when 09:28:40
16 it reaches 900. 09:28:43
17 Now, again, the purpose of the '714 09:28:44
18 patent is to provide the decoder with the 09:28:47
19 information necessary to come up with a 09:28:52
20 prediction of the motion for the -- for block 09:28:56
21 900. 09:29:01
22 Q. And in the '714 patent, the information 09:29:01

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1 necessary to come up with a motion vector 09:29:04
2 prediction for block 900 comes from the 09:29:07
3 neighboring blocks shown in Figure 9? 09:29:10
4 A. In the '714 patent, the neighboring blocks 09:29:17
5 in Figure 9 can contribute potentially motion -- 09:29:20
6 the motion information need -- that the decoder 09:29:26
7 needs to -- to come up with a prediction. 09:29:29
8 I say "potentially" because it is 09:29:32
9 possible that motion information may not be 09:29:35
10 available for some of those blocks. Some of 09:29:40
11 those blocks could be intra-coded or something 09:29:42
12 like that. 09:29:44
13 So -- so to the extent that those 09:29:45
14 blocks have motion information available, then 09:29:48
15 they -- then the information in those blocks 09:29:52
16 could be used by the decoder and the -- the 09:29:54
17 encoder to encode and then -- then commensurately 09:29:57
18 the decoder based on the encoding to decode the 09:30:01
19 predicted motion vector. 09:30:05
20 Q. Let's go back to Claim 23, please. I'd 09:30:06
21 like to get your take on one of the limitations. 09:30:10
22 Let me know when you're there. 09:30:18

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1 A. I am at Claim 23. 09:30:21
2 Q. So we're looking at Claim 23 of the '714 09:30:23
3 patent, and I'd like to ask you about the 09:30:27
4 "determine a subset" limitation. 09:30:30
5 Do you see that? 09:30:33
6 A. "Determine a subset of spatial motion 09:30:33
7 vector prediction candidates based on the 09:30:37
8 location of the block associated with the first 09:30:38
9 spatial motion vector prediction candidate," that 09:30:41
10 one? 09:30:43
11 Q. That's right. That's the limitation I'm 09:30:43
12 looking at in Claim 23. 09:30:45
13 And you -- you offer -- well, I -- 09:30:47
14 actually, I should be precise. 09:30:49
15 In your declaration, you say that you 09:30:51
16 (as read) applied the interpretation of the block 09:30:53
17 associated with the first spatial motion vector 09:30:56
18 prediction candidate that you believe the patent 09:31:00
19 examiner applies in prosecution of an earlier 09:31:02
20 family member of the '714 patent. 09:31:06
21 A. That's correct. 09:31:09
22 I applied the -- I applied the 09:31:10

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1 construction that -- that the block, which is, 09:31:12
2 you know, antecedent to the block of pixels in 09:31:15
3 the first claim limitation, that that block in 09:31:20
4 claim limitation -- I guess it would be 23B in 09:31:24
5 our -- in our jargon which we're talking about 09:31:28
6 here, is the current block of pixels that's -- 09:31:30
7 that's being encoded. 09:31:32
8 And I base that on the patent 09:31:33
9 examiner's discussion of the '823 patent, which 09:31:36
10 is a parent patent to the '714 patent. 09:31:40
11 And in that discussion, the patent 09:31:42
12 owner excite -- excited -- the patent owner cited 09:31:44
13 Tai, which was a -- a paper which I actually have 09:31:50
14 a copy of here. 09:31:54
15 And specifically, the patent owner 09:31:57
16 cited -- so if we -- if we take a look at Tai, 09:32:00
17 the -- the section that the patent owner 09:32:06
18 discussed begins on Page 189 of Tai, bottom of 09:32:09
19 column number two, where the -- Tai very clearly 09:32:13
20 says that -- that you're finding a motion vector 09:32:17
21 for a block, X with an arrow over it, that motion 09:32:19
22 vector being labeled MV arrow -- with an arrow 09:32:23

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1 over it, superscript I; and that's a function 09:32:26
2 of -- of the block and T. 09:32:30
3 And the patent owner referred, in 09:32:32
4 particular, to -- patent owner, I'm sorry -- the 09:32:34
5 patent examiner referred, in particular, to 09:32:37
6 equation two. 09:32:40
7 Equation two defines a subset of 09:32:41
8 motion vectors X, CS superscript I, a function of 09:32:45
9 X, which is a function of -- of X with a -- with 09:32:50
10 an arrow over the top. 09:32:52
11 That subset is searched in equation 09:32:55
12 number one for a given pass, pass I -- the 09:32:59
13 superscript "I" denotes the pass -- to find the 09:33:03
14 current -- to find the motion vector 09:33:06
15 corresponding to the current block. 09:33:08
16 So that's the selection process, if 09:33:10
17 you will. 09:33:11
18 But the important thing that the 09:33:11
19 patent -- patent examiner noted was that the -- 09:33:15
20 that the subset, CS superscript I, was vector -- 09:33:17
21 included only vectors V, where V was equal to 09:33:22
22 something defined as PMV with an arrow over it, 09:33:27

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1 I, of X. 09:33:31
2 Now, PMV with an arrow over it of I -- 09:33:32
3 and, again, the I is -- denotes the pass. That 09:33:37
4 was determined by not doing a full search of 09:33:40
5 blocks around the current -- the current block. 09:33:43
6 So if you see Figure 2, there's a -- 09:33:46
7 this gives the geometric relationship between the 09:33:51
8 current block and the three blocks on all sides 09:33:54
9 of it. 09:33:57
10 And the idea here was that you only 09:33:57
11 have to check one of the -- when you -- if you 09:33:59
12 do -- if you check three blocks, one of them will 09:34:03
13 have the same motion as the current block. 09:34:06
14 So you can see in Figure 2 the object 09:34:08
15 boundary. Only one of those will be in the 09:34:11
16 current object. 09:34:13
17 So the innovation here was that -- was 09:34:13
18 that you could use a pattern not looking at all 09:34:15
19 the blocks around it, but looking at a subset of 09:34:17
20 those blocks, which is shown in Figure 3. 09:34:20
21 So for the first pass, the first pass 09:34:22
22 is -- these passes are multi-resolutional. They 09:34:24

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1 start with 32-by-32 pixel blocks, and then they 09:34:27
2 go down to 16-by-16, 8-by-8, 4-by-4. 09:34:31
3 In the first pass, you use the three 09:34:35
4 patterns shown in Figure 3, 1, 2, and 3, in order 09:34:37
5 to figure out exactly for that pass what the 09:34:41
6 rough motion vector is; and then you go through 09:34:47
7 subsequent passes in our finding. 09:34:50
8 The bottom line in all this, though, 09:34:51
9 is the patent examiner very clearly cited the 09:34:54
10 fact that -- in terms of equation two, that this 09:34:58
11 was a subset and that -- a subset of the 09:35:00
12 potential motion vector prediction candidates, if 09:35:08
13 you will, in the jargon of the '714 patent, and 09:35:11
14 that all candidates were not being checked in 09:35:15
15 this process, and then the selection in equation 09:35:18
16 one was made from the subset. 09:35:21
17 MR. VERBONCOEUR: I'd like to 09:35:23
18 introduce as Exhibit 2 the 604 declaration, 09:35:24
19 please. 09:35:26
20 (Whereupon Exhibit 2 was marked 09:35:26
21 for identification.) 09:35:26
22 Q. (BY MR. VERBONCOEUR) All right. Doctor, 09:35:49

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1 you've just been handed what's been marked as 09:35:49
2 Exhibit 2. 09:35:52
3 Will you please let me know if you 09:35:53
4 agree that's your 604 declaration? 09:35:55
5 A. It certainly appears to be. 09:36:10
6 Q. And, Doctor, we previously agreed that we 09:36:12
7 will refer to your 604 declaration because the 09:36:14
8 opinions you express in the 604 and 605 09:36:17
9 declarations are substantially similar. 09:36:21
10 A. We did agree to that, yes. 09:36:22
11 Q. I'd like you to go to paragraph 66 of your 09:36:23
12 declaration, please. 09:36:27
13 A. Yes, I'm there. 09:36:28
14 Q. Okay. This section is about what you call 09:36:29
15 "the block" term, and it's within a larger 09:36:32
16 section titled "Claim Construction." 09:36:36
17 A. That is correct. 09:36:41
18 Q. The only paragraph in "the block" section 09:36:42
19 is paragraph 66. 09:36:45
20 A. That is correct. 09:36:49
21 Q. And you cite to -- I see two distinct 09:36:49
22 citations in this entire section on "the block," 09:36:55

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1 one of which is a nonfinal office action, and the 09:36:57
2 other is the applicant's reply to that office 09:37:01
3 action. 09:37:05
4 A. That is correct, yes. 09:37:14
5 Q. And I took from this to -- to mean that 09:37:15
6 the support you find for your interpretation of 09:37:18
7 "the block" is focused on the examiner's 09:37:20
8 interpretation under your view of -- of what the 09:37:25
9 examiner did. 09:37:27
10 A. I mention also at other points in this -- 09:37:31
11 in this -- in my discussion that there is, in 09:37:35
12 addition, the -- the antecedent basis, the fact 09:37:38
13 that the only other reference to a block in the 09:37:41
14 patent claim is in the -- in -- in part A of the 09:37:45
15 claim, where the block referred to is the block 09:37:49
16 of pixels. 09:37:50
17 Q. And when you refer to "antecedent basis," 09:37:52
18 are you referring to a legal principle 09:37:57
19 communicated to you by counsel? 09:37:59
20 A. That's my understanding. 09:38:00
21 I mean, it's -- it's the fact that -- 09:38:01
22 you know, that -- my understanding of that -- of 09:38:04

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1 that principle is that -- is that something is 09:38:05
2 referred to earlier as -- in a claim limitation, 09:38:10
3 is -- and -- is -- is -- is -- is taken or can be 09:38:14
4 taken -- I mean, it's logically taken that when 09:38:17
5 you use that same term later on, you're referring 09:38:20
6 to that thing that was defined earlier in a claim 09:38:23
7 limitation. 09:38:26
8 That's my understanding of the 09:38:26
9 process. 09:38:26
10 Q. And so the reason you apply the 09:38:26
11 interpretation you did of "the block" associated 09:38:28
12 with the first spatial motion vector prediction 09:38:30
13 candidate is, one, what you believe the examiner 09:38:33
14 did in the prosecution of the earlier family 09:38:36
15 member, and, two, your understanding of the 09:38:39
16 antecedent basis? 09:38:41
17 A. Well, and, three, the fact that, as a 09:38:42
18 person of ordinary skill in the art, this is how 09:38:44
19 I would have -- would have understood this. 09:38:47
20 So that's implicit in -- in my entire 09:38:50
21 opinion. 09:38:52
22 Q. Okay. And -- and let's talk about 09:38:53

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1 antecedent basis. 09:38:55
2 Do you have an understanding of that 09:38:56
3 principle, antecedent basis, in patent law? 09:38:59
4 A. Again, as I -- as I've said, my -- my 09:39:03
5 understanding -- and you're welcome to correct me 09:39:06
6 if I'm wrong. I'm not a lawyer. I don't -- I 09:39:08
7 don't claim to be a lawyer. 09:39:09
8 My understanding is that if some term 09:39:10
9 is defined in a claim, in the same claim earlier 09:39:14
10 on in that claim, and then the term is -- is -- 09:39:18
11 is put forth again, that term is put forth again 09:39:23
12 in that claim, that one would assume that when it 09:39:27
13 was mentioned the second time, you're referring 09:39:33
14 to the same thing that was defined in the first 09:39:35
15 one. Now -- the first time. 09:39:37
16 Now, if that's incorrect, I apologize, 09:39:38
17 but that's my understanding of the principle. 09:39:40
18 Q. It would be inappropriate for me to 09:39:42
19 instruct you on the principle of antecedent 09:39:44
20 basis. 09:39:44
21 But were you aware that antecedent 09:39:46
22 basis can also be implied? 09:39:50

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1 A. I mean, I -- I think anything can be 09:39:52
2 implied, but I -- I -- I do not claim to know all 09:39:54
3 the details of -- of antecedent basis. 09:39:58
4 So if you want somebody to testify on 09:40:00
5 that, you'll need to find a lawyer, I suspect. 09:40:02
6 Q. Okay. And let's talk about what the 09:40:05
7 examiner did in the earlier prosecution. 09:40:08
8 MR. VERBONCOEUR: So I'd like to 09:40:10
9 introduce that as Exhibit 3. 09:40:11
10 (Whereupon Exhibit Number 3 was 09:40:16
11 marked for identification.) 09:40:16
12 Q. (BY MR. VERBONCOEUR) So, Doctor, going 09:40:41
13 back to paragraph 66 of your declaration -- 09:40:52
14 A. Okay. Yes, paragraph 66. 09:40:57
15 Q. -- when you cite to the nonfinal office 09:41:12
16 action, you cite to one page in particular, 09:41:14
17 Page 168. 09:41:17
18 A. That's what -- that's what -- yeah, that's 09:41:19
19 what it says, uh-huh. 09:41:21
20 Q. What's been marked as Exhibit 3 is 09:41:21
21 Page 168 of the nonfinal office action. 09:41:24
22 Can you please take a look at 09:41:29

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1 Exhibit 3 and let me know whether you recognize 09:41:29
2 it? 09:41:32
3 A. Yeah. It looks like the same as the copy 09:41:38
4 of 168 I have in my binder. 09:41:40
5 Q. Okay. Great. 09:41:42
6 And this is part of the office action 09:41:43
7 that refers to the determining a subset 09:41:47
8 limitation. 09:41:50
9 Do you see that? 09:41:50
10 A. I -- I see that. 09:41:51
11 Q. And there's the CS equation of Tai that 09:41:52
12 the examiner cites; and I believe you just 09:41:56
13 mentioned that equation, too. 09:41:58
14 A. I did mention that equation, yes. 09:41:59
15 Q. And then the examiner continues, 09:42:02
16 "determining a subset of spatial motion vector 09:42:04
17 predictions based on the location of the block 09:42:09
18 associated with the first spatial motion vector 09:42:10
19 prediction candidate, i.e." -- in other words, 09:42:14
20 that is -- "by selecting one of the PMV," with 09:42:15
21 the arrow on top "from MVs of neighboring blocks, 09:42:18
22 a subset of CSi" for X and t "is defined for a 09:42:22

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1 different linear combination of that PMV and U," 09:42:26
2 with an arrow over it, USi. 09:42:30
3 Do you see that? 09:42:33
4 A. I do, yes. 09:42:34
5 Q. Okay. And so one way of interpreting -- 09:42:35
6 actually, I -- I'm not -- well, I -- I won't 09:42:37
7 profess to agree with this, but it seems like 09:42:39
8 you're interpreting the examiner's comments here 09:42:42
9 to -- to mean that "associated with the first 09:42:45
10 spatial motion vector prediction candidate" is 09:42:48
11 referring to the block being encoded or decoded. 09:42:50
12 A. I think it's pretty clear that it's 09:42:55
13 referring to the block being encoded and decoded, 09:42:57
14 yes. 09:42:59
15 Q. Okay. Now, what the examiner says on 09:43:00
16 Page 168 of Exhibit 3 is, "by selecting one of 09:43:02
17 the PMVs from MVs of neighboring blocks." 09:43:08
18 How in Tai are the PMVs selected? 09:43:11
19 A. So I'm glad you asked. 09:43:14
20 If we look at Tai -- so if we -- first 09:43:17
21 of all, the -- the CS -- okay. So the final 09:43:21
22 selection, the final selection of the predicted 09:43:27

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1 motion is given by equation one, which is not -- 09:43:30
2 not -- which is shown in -- also on Page 1 -- 168 09:43:32
3 further down, so that's the final selection 09:43:37
4 process. 09:43:40
5 But the final selection is made from 09:43:40
6 the set CS superscript i. 09:43:42
7 And, again, the "i" -- so this is a 09:43:45
8 multipass process. So what it's going to do is 09:43:48
9 it's going to do three passes the first time with 09:43:51
10 32-by-32 blocks, going through the entire image, 09:43:53
11 three passes, 32-by-32 blocks, and each pass is 09:43:56
12 labeled "i." 09:44:01
13 So pass 1, pass 2 -- i equals 1, i 09:44:02
14 equals 2, i equals 3, and so on. 09:44:05
15 So the first time -- let's just take 09:44:07
16 this through -- when i is equal to one, it's 09:44:09
17 going to go through this process. It's going 09:44:11
18 to -- it's going to create a set, CS superscript 09:44:13
19 1, for the current block X bar. 09:44:16
20 And the vectors in that set will 09:44:19
21 include -- so -- so the V with an arrow over it, 09:44:22
22 that's going to be a potential motion vector. 09:44:25

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1 The vectors in that set will be selected from 09:44:27
2 what would -- the vector will be selected from V 09:44:32
3 with an arrow over it and then PMV with an arrow 09:44:35
4 over it i -- in this case, i is equal to 1 -- X 09:44:39
5 plus U. 09:44:42
6 Okay. We don't need to worry about 09:44:43
7 the U. U is an update vector. It's not really 09:44:44
8 germane to this case. 09:44:47
9 The important thing here is the 09:44:49
10 selection of PMV. 09:44:51
11 Now, if you read the paragraphs below 09:44:53
12 that, what it says is that -- is that the PMV -- 09:44:56
13 a single PMVi will be selected based on the 09:44:59
14 search pattern. 09:45:03
15 So you're going to look at these 09:45:04
16 three -- so for pass one, if we go to Figure 3, 09:45:05
17 we'll look at the three candidates that you see 09:45:08
18 here, sort of shaded around the current block, 09:45:11
19 the current block being in the center, and we 09:45:15
20 will select the best choice candidate for that. 09:45:17
21 And then you'll add this -- this 09:45:21
22 up- -- this update will allow you to have some 09:45:23

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1 variations around that. 09:45:25
2 So you'll do the selection from 09:45:26
3 those -- select one from those three for the 09:45:28
4 first time. 09:45:31
5 Then the next time through, i is going 09:45:31
6 to equal 2. And you're still going to be at 09:45:34
7 32-by-32 block size, but now you're going to use 09:45:38
8 pattern number 2 and you will select the best one 09:45:41
9 from there. 09:45:43
10 The idea here is that you will do this 09:45:44
11 iteratively; and as you go through this process, 09:45:49
12 you should end up with a better, more and more 09:45:51
13 refined motion vector for the current block. 09:45:53
14 So it's all based on -- on finding 09:45:56
15 progressively better motion estimates for the 09:46:00
16 current block. 09:46:03
17 Q. So for each value of i, and i could have a 09:46:04
18 range of 1 to 12, there is going to be, as 09:46:07
19 described in Tai, three motion vectors that are 09:46:11
20 considered here; and then each of those will have 09:46:14
21 associated updated vector sets? 09:46:17
22 A. The -- so first there's going to be a 09:46:21

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1 selection. 09:46:25
2 So to figure out what -- to figure out 09:46:26
3 what choice of -- for PMV, arrow over it, i has 09:46:29
4 made, you're going to consider a pattern of three 09:46:34
5 vectors around the current -- three motion -- 09:46:37
6 motion -- potential motion vectors around the 09:46:39
7 current block. 09:46:42
8 And then, of course, you -- then your 09:46:45
9 set will also -- it will be a set because it will 09:46:47
10 include the plus vector U, which is these sort of 09:46:50
11 little variational updates around that, which 09:46:53
12 actually change as you're going through the -- 09:46:56
13 the pass process, but that's -- that's, again, 09:46:58
14 neither here nor there. 09:47:00
15 So first time -- first time through 09:47:02
16 when i is equal to 1, you're going to use the 09:47:04
17 vector set that you see in -- labeled "1" in 09:47:06
18 Figure 3. 09:47:09
19 Second time through, you're going to 09:47:10
20 lose -- use the set labeled "2." 09:47:12
21 Third time through you're going to 09:47:14
22 lose the set -- use the set labeled "3." 09:47:16

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1 Q. Right. 09:47:17
2 And in each case, a motion vector V in 09:47:19
3 the candidate vector set has a PMV that's taken 09:47:23
4 from the neighboring block and an update vector? 09:47:28
5 A. The -- the PMV -- yeah. The -- well, 09:47:36
6 "taken from"? I'm not sure I'd say that, say -- 09:47:39
7 say "taken from." 09:47:41
8 But the PMV is going to be -- is going 09:47:42
9 to be -- you know, the -- the candidate, if you 09:47:45
10 will, will be one of those three -- the -- the 09:47:50
11 motion vectors from one of those three blocks 09:47:56
12 that surround the current block. 09:47:59
13 Q. All right. And in each case, the 09:48:00
14 candidate vector set is going to be one of the 09:48:02
15 vectors from a neighboring block that surrounds 09:48:06
16 the current block and an update vector? 09:48:07
17 A. Well, the candidate vector set -- the 09:48:11
18 candidate vector set is going to -- is going to 09:48:15
19 be those -- so the candidate vector set will be 09:48:20
20 those three -- the -- the vectors corresponding 09:48:26
21 to those three blocks surrounding the current 09:48:29
22 block, right? That's -- that's -- that's our 09:48:32

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1 vector set. 09:48:33
2 Then the candidate vector will be 09:48:34
3 selected from that, plus the additional blocks 09:48:36
4 from the -- the additional variations caused by 09:48:40
5 the addition of the plus U. 09:48:43
6 Q. Right. 09:48:45
7 So when you refer to the candidate set 09:48:45
8 that includes the three motion vectors that come 09:48:48
9 from neighboring blocks, you're referring to "CS" 09:48:51
10 for "candidate set"? 09:48:53
11 A. "CS" is broader. 09:48:58
12 So -- so we have to distinguish 09:49:00
13 between the candidate set or subset or whatever 09:49:03
14 with respect to the '714 patent and what the -- 09:49:08
15 what the -- what the candidate set or subset or 09:49:12
16 whatever is with respect to -- to this -- to the 09:49:15
17 Tai paper. 09:49:19
18 I mean, the patent examiner was not 09:49:20
19 considering the U in -- you know, the -- the U -- 09:49:24
20 the -- the -- the U vector portion of this. He 09:49:29
21 did not feel that that was -- that was what 09:49:30
22 was -- was making it -- making the '833 patent 09:49:34

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1 unpatentable. He was -- he was focused on the -- 09:49:43
2 the -- the PMV part of it. 09:49:49
3 So -- so in terms of the Tai patent, 09:49:51
4 CS superscript I is -- is, indeed, a set. And, 09:49:56
5 in fact, Tai -- Tai -- you know, he calls it a 09:50:02
6 candidate set, candidate vector set, right? 09:50:04
7 But that's not the equivalent of -- 09:50:07
8 that's not what the patent examiner was focused 09:50:09
9 on, and that's not the equivalent set or subset 09:50:12
10 with respect to the '714 patent. 09:50:16
11 With respect to the '714 patent, 09:50:18
12 the -- the subset, if you will -- this would be 09:50:22
13 the subset, this -- with respect to the '714 09:50:25
14 patent, the patent examiner's interpretation was 09:50:29
15 that -- that the eight vectors surrounding the 09:50:31
16 current vector were the set and that the subset 09:50:34
17 that was not the entire vector was the -- was the 09:50:38
18 three vectors that you were actually testing for 09:50:42
19 equation two to -- to -- to -- in equation two to 09:50:46
20 figure out what PMV with an arrow over it 09:50:50
21 superscript i actually is. 09:50:56
22 Q. So, I mean, just sticking to the facts 09:50:58

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1 here, the paper Tai calls CS the candidate vector 09:51:02
2 set. 09:51:08
3 I think we agree with that? 09:51:08
4 A. I believe I just said that, yes. 09:51:09
5 Q. Okay. And CS is not what the examiner is 09:51:11
6 pointing to as a subset. 09:51:15
7 I think we agree with that, too? 09:51:17
8 A. The examiner is pointing to a portion 09:51:19
9 of CS -- of -- of the creation of CS. He's 09:51:21
10 pointing to the process of -- within the creation 09:51:24
11 of CS, he's pointing to the process of how PMV 09:51:27
12 with an arrow over it superscript i is selected. 09:51:33
13 Q. Right. 09:51:37
14 And -- and the examiner makes that 09:51:38
15 clear on Exhibit 3 where the examiner says, "that 09:51:39
16 is, by selecting one of the PMVs from MVs of 09:51:44
17 neighboring blocks, a subset of CS is defined." 09:51:49
18 Do you see that? 09:51:52
19 A. I do see that, and that's exactly what I 09:51:53
20 was saying. 09:51:56
21 I was saying the patent -- the patent 09:51:57
22 examiner says that around the current block, you 09:51:58

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1 have eight other blocks that you could use. That 09:52:01
2 would be the -- the entire set, but Tai selects a 09:52:03
3 subset. He selects three of those blocks to 09:52:07
4 test. 09:52:10
5 Q. You would think that if the examiner had 09:52:10
6 that interpretation, the examiner would have said 09:52:13
7 something like, "by selecting three out of eight 09:52:15
8 motion vectors from neighboring blocks, CS is 09:52:19
9 defined." 09:52:22
10 But the examiner, instead, said, "by 09:52:23
11 selecting one of the PMVs from" the -- "from MVs 09:52:26
12 of neighboring blocks, a CS is defined." 09:52:28
13 A. Well, CS does select -- I said CS selects 09:52:30
14 one, but it selects one of three. 09:52:33
15 I agree the examiner's -- the 09:52:35
16 examiner's phraseology is -- is not perfect; but 09:52:38
17 I'm -- I'm quite certain that -- that his 09:52:40
18 thinking is the same as mine because, yes, I've 09:52:43
19 already said that -- that in the selection 09:52:46
20 process, in creating CS superscript i, you select 09:52:48
21 V, such that that's equal to PMV, arrow above it, 09:52:53
22 superscript i, plus the U. 09:53:00

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1 And when you select from these three 09:53:01
2 blocks, right, from these three surrounding 09:53:04
3 blocks -- not from the eight blocks in the entire 09:53:06
4 set, but from the three in the subset -- when you 09:53:09
5 select one of those three, right, which you say 09:53:11
6 you're selecting one of them, that is the 09:53:14
7 selection process. 09:53:16
8 And then, like I say, the addition of 09:53:16
9 the U really isn't germane to the -- to the -- 09:53:18
10 his analysis. 09:53:21
11 Q. So in Exhibit 3, when the examiner is -- 09:53:23
12 is identifying a subset of CS, the -- the 09:53:27
13 examiner notes that that subset is defined by 09:53:30
14 selecting one of the PMV from MVs of neighboring 09:53:34
15 blocks. 09:53:39
16 A. Just so -- just so -- just so I can read 09:53:44
17 it, which -- where are you on the page when 09:53:46
18 you're reading that? 09:53:48
19 Q. Yeah. I was paraphrasing the "that is" 09:53:49
20 statement following, "based on the location of 09:53:53
21 the block associated with the first spatial 09:53:55
22 motion vector prediction candidate." 09:53:57

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1 A. Okay. 09:53:58
2 Q. Let -- I -- let me reask that. 09:53:58
3 So -- so when the examiner is looking 09:54:00
4 at "based on the location of the block associated 09:54:01
5 with the first spatial motion vector prediction 09:54:04
6 candidate," the examiner says that is -- and I'm 09:54:06
7 skipping ahead now -- "a subset of CS is defined 09:54:10
8 by selecting one of the PMV from MVs of 09:54:13
9 neighboring blocks." 09:54:17
10 A. Yeah, but -- and I've already said, right, 09:54:20
11 you're selecting one; but the point is, you're 09:54:23
12 not selecting one from all eight neighbors. 09:54:25
13 You're selecting one from a subset of three 09:54:28
14 neighbors. 09:54:30
15 Q. And I don't want to interrupt you, so 09:54:41
16 please let me know if -- if you're -- 09:54:43
17 A. Sure. 09:54:43
18 Q. -- not done with your answer. 09:54:45
19 A. Sure. 09:54:46
20 Q. Are you -- are you done with your answer? 09:54:47
21 A. Yes. I think I'm done with my answer for 09:54:49
22 the time being. 09:54:51

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1 Q. Okay. Thank you. Sorry. I didn't want 09:54:52
2 to talk over you. 09:54:53
3 And you agree, looking at Figure 3 of 09:54:54
4 Tai -- 09:54:59
5 MR. VERBONCOEUR: And, actually, 09:55:00
6 let's just, for the record, go ahead and 09:55:01
7 introduce this as an exhibit, if you could please 09:55:03
8 mark this as Exhibit 4. 09:55:05
9 (Whereupon Exhibit Number 4 was 09:55:06
10 marked for identification.) 09:55:24
11 Q. (BY MR. VERBONCOEUR) All right. Doctor, 09:55:24
12 you've been handed what's been marked as 09:55:24
13 Exhibit 4. 09:55:27
14 Do you agree this is the Tai paper 09:55:28
15 that you've been referring to as "Tai"? 09:55:29
16 A. Yes, and it's in full color. It's very 09:55:31
17 nice. 09:55:34
18 Q. Yes, you're welcome. 09:55:35
19 I'd like to direct your attention to 09:55:37
20 Figure 3 of Tai. 09:55:39
21 A. Okay. 09:55:42
22 Q. And we were just discussing the examiner's 09:55:42

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1 nonfinal office action here when the examiner is 09:55:46
2 referring to selecting one of the PMVs from MVs 09:55:49
3 of neighboring blocks to define as a subset of 09:55:53
4 CS. 09:55:56
5 And you made the point that when Tai 09:55:56
6 is picking one of these PMVs, that's actually 09:55:58
7 not -- it's not possible in Tai for a given pass 09:56:01
8 to look at all eight surrounding blocks. It's 09:56:04
9 just looking at three of those eight surrounding 09:56:07
10 blocks, right? 09:56:11
11 A. I would disagree that it's -- that -- with 09:56:11
12 your statement that it's -- it's not possible. 09:56:12
13 It is most definitely possible, and 09:56:14
14 Tai acknowledges that -- that one could do that, 09:56:16
15 but -- but Tai is -- is pointing to the fact 09:56:20
16 that -- that one doesn't need to do that. 09:56:22
17 One can do it by looking at three 09:56:25
18 blocks; and, in fact, Tai cites -- citation 09:56:28
19 number two in Tai cites another paper, which I 09:56:30
20 have -- I don't claim to have read, where 09:56:35
21 apparently the idea was originally developed. 09:56:37
22 Q. Yeah, and I apologize for the imprecise 09:56:40

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1 question. 09:56:43
2 But my question is: If one takes 09:56:43
3 Tai's approach -- 09:56:45
4 A. Uh-huh. 09:56:45
5 Q. -- rather than looking to all eight of the 09:56:46
6 surrounding blocks, one will consider three of 09:56:48
7 them, and then they will pick one of the PMVs 09:56:50
8 from those MVs of those three blocks as opposed 09:56:53
9 to examining all eight. 09:56:58
10 A. I -- yeah. I believe -- at least I 09:57:00
11 believe I already said that -- that that's what 09:57:02
12 Tai does. 09:57:04
13 Tai does -- in each pass Tai does not 09:57:05
14 look at all eight surrounding blocks. It only -- 09:57:08
15 it -- they show in Figure 2 -- you know, where 09:57:10
16 they show the current block, that -- that's the 09:57:13
17 justification for only needing to be able to look 09:57:15
18 at three blocks to figure out which block is in 09:57:17
19 the same object as the current block. 09:57:21
20 Q. And if we look at Figure 2, you agree that 09:57:24
21 what's labeled as "Current Block" in Figure 2 of 09:57:26
22 Tai, that one doesn't have a PMV at the point at 09:57:29

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1 which the processing is done; rather, N1, N2, and 09:57:32
2 N3 are considered for their PMVs? 09:57:37
3 A. Well, I think -- I think I have to -- I 09:57:39
4 have to sort of disagree with that. It depends. 09:57:40
5 Remember, Tai is a multi-pass process. 09:57:45
6 It's going to be iteratively improving the motion 09:57:48
7 vector estimate on a smaller and smaller scale. 09:57:52
8 So the way you phrased it, that it 09:57:54
9 doesn't have a motion vector, that's only true on 09:57:57
10 pass one. 09:57:59
11 On -- after pass one, it's going to, 09:58:01
12 as it is -- and especially as it gets down to 09:58:04
13 smaller and smaller block sizes, it's going to be 09:58:06
14 taking the motion vectors that it -- that it -- 09:58:08
15 that it -- its motion vector estimates from 09:58:12
16 previous passes, and it's going to be refining 09:58:13
17 them. 09:58:15
18 Q. All right. So let's put it this way: 09:58:15
19 Looking at Figure 2 in the current block with N1 09:58:18
20 and 2 and 3, PMV with the bar on top of it, 09:58:21
21 superscript i, is chosen from the motion vectors 09:58:26
22 of one of the neighboring blocks -- that is, N1, 09:58:29

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1 N2, N3. It's -- it's obviously not chosen from 09:58:31
2 the current block. 09:58:33
3 A. Are you referring to equation one? 09:58:35
4 Q. Referring to equation two and -- 09:58:37
5 A. Ahh. 09:58:37
6 Q. -- if it's helpful, I'm -- I'm reading 09:58:40
7 directly from Tai, where it says, "where PMV, 09:58:42
8 with arrow, superscript i, is the PMV of block X 09:58:45
9 and is chosen from the MVs of the neighboring 09:58:49
10 blocks." 09:58:52
11 A. No. Yeah, that -- that's correct. 09:58:52
12 And -- and, again, I said that 09:58:53
13 multiple times, that -- that PMV, with the arrow 09:58:55
14 over it, i in CS superscript i in the formula -- 09:58:59
15 formula two is chosen by looking at a set of 09:59:04
16 three neighboring blocks -- again, as given in 09:59:10
17 the scan pattern of Figure 3, depending upon the 09:59:13
18 pass. 09:59:13
19 And -- and you'll select the best of 09:59:16
20 those for -- for PMV, arrow over it, superscript 09:59:20
21 i. 09:59:24
22 Q. Figure 3 of Tai defines various location 09:59:24

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1 combinations of three neighboring blocks that Tai 09:59:31
2 will consider in each of its 12 passes. 09:59:36
3 A. I definitely agree with that, yes. 09:59:41
4 Q. All right. Let's go back to what's been 09:59:43
5 marked as Exhibit 1, please, which I believe is 09:59:55
6 the '714 patent. 10:00:02
7 A. (Complying.) 10:00:04
8 Q. All right. And could you please look at 10:00:05
9 Claim 23, please. 10:00:15
10 A. (Complying.) I'm looking at Claim 23. 10:00:16
11 Q. Okay. And -- and the -- the full 10:00:26
12 limitation is, "determine a subset of spatial 10:00:32
13 motion vector prediction candidates based on the 10:00:35
14 location of the block associated with the first 10:00:37
15 spatial motion vector prediction candidate." 10:00:40
16 Are you -- do you see that? 10:00:42
17 A. I do. 10:00:43
18 Q. There is the term "associated with the 10:00:43
19 first spatial motion vector prediction 10:00:48
20 candidate." 10:00:50
21 In your view, does that phrase modify 10:00:51
22 the block or does it modify a subset? 10:00:53

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1 A. I believe it modifies the location of the 10:01:25
2 block. 10:01:28
3 Q. So the location is associated with the 10:01:33
4 first spatial motion vector prediction candidate? 10:01:38
5 A. The location of the block -- well, I mean, 10:01:47
6 it says, "the location of the block associated 10:01:51
7 with the first spatial -- spatial motion vector 10:01:54
8 prediction candidate." 10:01:56
9 So you have a block. It has a 10:01:56
10 location, and it needs to be associated in some 10:02:00
11 manner with the first spatial motion vector 10:02:04
12 prediction candidate. 10:02:08
13 Q. I noticed you said, for Claim 23, in 10:02:08
14 the -- the block associated with the first 10:02:12
15 spatial motion vector prediction candidate needs 10:02:14
16 to be associated in some manner. 10:02:15
17 How do you think a person of skill in 10:02:17
18 the art would understand "associated with the 10:02:20
19 first spatial motion vector prediction 10:02:21
20 candidate"? 10:02:26
21 A. I think -- well, we -- we have -- again, 10:02:26
22 we -- we have to get in -- like, there's the 10:02:32

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1 location, too, right? 10:02:34
2 So there has to be some sort of -- of 10:02:35
3 spatial relationship between the block and the 10:02:39
4 first spatial motion vector prediction candidate. 10:02:44
5 That is how I believe a person of ordinary skill 10:02:47
6 in the art would interpret that. 10:02:50
7 Q. The interpretation you applied to the 10:02:51
8 block associated with the first spatial motion 10:02:55
9 vector prediction candidate is that it's 10:02:57
10 referring to the current block being encoded or 10:02:59
11 decoded; for example, block 900 in Figure 9 of 10:03:04
12 the '714 patent? 10:03:09
13 A. I have interpreted it as being related to 10:03:10
14 the current block being encoded or decoded. That 10:03:12
15 is correct. 10:03:15
16 Q. And what I'm trying to figure out is 10:03:15
17 that -- isn't it necessarily the case that the 10:03:17
18 current block, pixels is going to be associated 10:03:20
19 with any spatial motion vector prediction 10:03:24
20 candidate for a predicted motion vector that 10:03:26
21 would apply to that block of pixels? 10:03:29
22 A. I'm sorry, I don't -- I don't understand 10:03:31

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1 your question. 10:03:33
2 Q. Yeah. So let's go back and look at 10:03:34
3 Figure 9 of the '714 patent. 10:03:36
4 A. (Complying.) Okay. 10:03:38
5 Q. All right. So when -- when you read "the 10:03:48
6 block associated with the first spatial motion 10:03:50
7 vector prediction candidate," you don't read that 10:03:53
8 as one of the blocks from which the spatial 10:03:54
9 motion vector prediction candidate comes; you 10:03:57
10 read that as the current block 900, which doesn't 10:03:58
11 have its own spatial motion vector prediction 10:04:01
12 candidate? 10:04:05
13 A. The current block 900 is the block that we 10:04:05
14 are trying to find a predicted motion vector for, 10:04:09
15 but -- so -- so the -- the -- the potential 10:04:12
16 candidates, then, for -- so the -- the potential 10:04:16
17 first motion vector prediction candidates, 10:04:21
18 right -- because we don't -- we don't know what 10:04:24
19 that's going to be in advance. 10:04:26
20 You know, this is a -- this is an 10:04:27
21 iterative process where we go from one block, and 10:04:28
22 then we -- we -- we move in a raster scan to the 10:04:33

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1 next block. 10:04:35
2 So in this example in Figure 9, the 10:04:35
3 potential spatial motion vector prediction -- 10:04:38
4 the -- the potential first spatial motion vector 10:04:38
5 prediction candidates are A0, A1, B2, B1, and B0. 10:04:43
6 And as I note, regardless of which of 10:04:49
7 those actually is this spatial motion vector 10:04:52
8 prediction candidate, their spatial locations are 10:04:57
9 all located relative to block 900, the current 10:05:00
10 block. 10:05:03
11 Q. Right, Doctor. I think that gets to the 10:05:05
12 crux of my question. 10:05:08
13 It -- the limitation -- the block 10:05:09
14 associated with the first spatial motion vector 10:05:13
15 prediction candidate will necessarily be met 10:05:15
16 regardless of what the first spatial motion 10:05:17
17 vector prediction candidate is in Figure 9 if we 10:05:20
18 assume "the block associated with" refers to 10:05:23
19 block 900. 10:05:26
20 It doesn't matter what the first 10:05:26
21 spatial motion vector prediction candidate is 10:05:28
22 because block 900 is in some way associated with 10:05:30

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1 all of the potential first spatial motion vector 10:05:32
2 prediction candidates. 10:05:35
3 MR. LIANG: Objection to form. 10:05:35
4 A. So the problem with that question is 10:05:37
5 that the -- is that in -- in trying to phrase it 10:05:40
6 that way, you're looking at this process as a 10:05:43
7 static process, because, remember, this Figure 9 10:05:46
8 is not fixed, right? 10:05:50
9 What we're doing is we're doing a 10:05:52
10 raster scan across the image, right? So as you 10:05:53
11 pointed out, going from the upper left-hand 10:05:56
12 corner down to the lower right-hand corner -- and 10:05:58
13 this is just one instant [sic] of it, right? 10:06:01
14 So we have block 900. That's our 10:06:03
15 current block. We're doing this process. We 10:06:06
16 have a -- a set of potential first spatial motion 10:06:09
17 vector prediction candidates, right? It's 10:06:15
18 these -- these five -- five potential -- 10:06:16
19 potential ones. 10:06:19
20 But then we're moving -- we're moving 10:06:20
21 to the next block, right? 10:06:23
22 So for the next block, we have an 10:06:25

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1 entirely new set of possible spatial motion 10:06:27
2 vector prediction candidates. The blocks are in 10:06:31
3 different locations. 10:06:32
4 The set of new spatial -- potential 10:06:33
5 first spatial motion vector prediction candidates 10:06:36
6 are all defined relative to the current block, 10:06:38
7 which is now in a different position. 10:06:42
8 Q. (BY MR. VERBONCOEUR) Right, and -- and I 10:06:45
9 think we agree on that point. 10:06:46
10 The set of candidates is defined 10:06:48
11 relative to the location of the current block. 10:06:50
12 A. But the set will include the first spatial 10:06:52
13 motion vector prediction candidate because that's 10:06:56
14 going to be chosen from that set. So it will 10:06:57
15 also be defined by the location of the current 10:07:00
16 block, and it will be associated with the 10:07:02
17 location of the current block. 10:07:04
18 Q. All right. And -- and so just to start 10:07:06
19 high and narrow down, so -- so your starting 10:07:08
20 point is, to start, if we know the location of 10:07:11
21 block 900, that's going to define the set of 10:07:14
22 candidates. 10:07:18

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1 A. With -- yes, within the image, if we know 10:07:21
2 the location of -- of -- of block 900, right, 10:07:23
3 that will define the potential -- the potential 10:07:26
4 set of first prediction motion vector candidates. 10:07:33
5 But, again, every time, since -- since 10:07:37
6 the process is dynamic, as we're moving through 10:07:39
7 the raster scan, every time we're going to have a 10:07:41
8 different set; so it still is dependent. 10:07:44
9 It -- the -- the -- there is an 10:07:46
10 association of the first motion vector prediction 10:07:49
11 candidate with the current block because the 10:07:51
12 current block's going to change; and if you 10:07:53
13 didn't have that -- that wording in there, then 10:07:55
14 you wouldn't be able to say that that -- that 10:07:57
15 this was dependent upon the location of the block 10:07:59
16 when the -- when the current block changes. 10:08:04
17 Q. So I'd like to direct your attention to 10:08:05
18 Claim 23 again and the limitation that precedes 10:08:08
19 the "determine a subset" limitation. 10:08:12
20 That limitation reads, "select a first 10:08:14
21 spatial motion vector prediction candidate from a 10:08:17
22 set of spatial motion vector prediction 10:08:19

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1 candidates for an encoded block of pixels." 10:08:21
2 Do you see that? 10:08:24
3 A. I do. 10:08:24
4 Q. All right. And I think we just agreed the 10:08:25
5 set of spatial motion vector prediction 10:08:27
6 candidates for an encoded block of pixels is 10:08:30
7 based on the location of that block of pixels. 10:08:33
8 A. We certainly agree with that. 10:08:36
9 And, of course, that also means that 10:08:38
10 the first spatial motion vector prediction 10:08:39
11 candidate is in that set, it has to be in that 10:08:42
12 set; so it's also based on the location of the -- 10:08:44
13 of the pixels. 10:08:47
14 Q. Right. 10:08:47
15 It's necessarily the case, for any 10:08:48
16 potential first spatial motion vector prediction 10:08:50
17 candidate, that it's going to be based on the 10:08:52
18 location of the encoded block of pixels because 10:08:53
19 that's what defines your set of spatial motion 10:08:56
20 vector prediction candidates. 10:09:05
21 A. As I've -- as I've been saying, it's -- 10:09:05
22 it -- it -- it -- the first spatial motion vector 10:09:08

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1 prediction candidate is selected from the set of 10:09:10
2 spatial motion vector prediction candidates, and 10:09:13
3 that set depends upon the location of the current 10:09:16
4 block, which means that there is an association 10:09:19
5 between the location of the first spatial motion 10:09:22
6 vector prediction candidate and the location of 10:09:26
7 the current block. 10:09:27
8 Q. If we go back to the "determine a subset" 10:09:29
9 limitation and we deleted the words "associated 10:09:32
10 with the first spatial motion vector prediction 10:09:35
11 candidate," do you think the limitation would 10:09:38
12 require anything different than the way you're 10:09:39
13 interpreting it? 10:09:41
14 MR. LIANG: Objection to form. 10:10:01
15 A. I believe that -- that putting in the 10:10:17
16 caveat that the location of the block is 10:10:20
17 associated with the first spatial motion vector 10:10:23
18 prediction candidate might not be necessary 10:10:27
19 because of the fact that the first -- first 10:10:29
20 spatial motion vector candidate -- prediction 10:10:32
21 candidate is from a set of spatial motion vector 10:10:34
22 prediction candidates -- let's see. 10:10:40

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1 Actually, no. I -- I -- I -- let me 10:10:42
2 rephrase that. 10:10:46
3 No. I -- actually, I -- I believe 10:11:04
4 it's -- I believe, with my interpretation, it is 10:11:06
5 still necessary to have that because, reading 10:11:08
6 part A of the claim, it says, "select a first 10:11:12
7 spatial motion vector prediction candidate from a 10:11:15
8 set of spatial motion vector prediction 10:11:17
9 candidates for an encoded block of pixels as a 10:11:20
10 potential spatial motion vector prediction 10:11:24
11 candidate to be included in a motion vector 10:11:26
12 prediction list for a prediction unit of the 10:11:31
13 encoded blocks where the motion vector prediction 10:11:34
14 list comprises motion vector information of the 10:11:37
15 spatial motion vector prediction candidates." 10:11:41
16 So it's -- so it's clear that there 10:11:44
17 is -- that -- that in part A, they say that the 10:11:48
18 list include -- comprises a list -- a list 10:11:51
19 comprises spatial motion information of -- let's 10:11:56
20 see -- no. 10:12:00
21 Actually, yeah. I don't see -- I 10:12:04
22 don't see anywhere in part A where they 10:12:07

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1 associate -- where they associate the set of 10:12:10
2 spatial motion vector prediction candidates to 10:12:20
3 spatial location. 10:12:25
4 So even -- with my interpretation of 10:12:26
5 the block, I believe that it actually is 10:12:29
6 important to have the "associated with the first 10:12:32
7 spatial motion vector prediction candidate" 10:12:35
8 because, again, as -- as we are moving, as we are 10:12:35
9 changing blocks, as we're moving through the 10:12:39
10 raster scan, we're going to have a different set 10:12:42
11 of spatial motion vector prediction candidates, 10:12:44
12 which are going to be defined by the position of 10:12:48
13 the block. 10:12:50
14 And that means that our first spatial 10:12:51
15 motion vector prediction candidate will also be 10:12:55
16 defined by the location of the block. 10:12:57
17 Q. (BY MR. VERBONCOEUR) Would a person of 10:12:58
18 skill in the art, reading the first limitation of 10:13:00
19 the claim, "selecting a first spatial motion 10:13:03
20 vector prediction candidate from a set of spatial 10:13:05
21 motion vector prediction candidates for an 10:13:07
22 encoded block of pixels" understand there to be a 10:13:08

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1 requirement that the set of spatial motion vector 10:13:11
2 prediction candidates depends on which encoded 10:13:14
3 block of pixels is being referred to? 10:13:16
4 A. I -- I mean, honestly, as a person of 10:13:23
5 ordinary skill in the art, I certainly would; but 10:13:27
6 you were asking -- your question was whether or 10:13:31
7 not, from the -- from -- again, I'm not a lawyer, 10:13:34
8 but whether or not, from a legal standpoint, 10:13:37
9 there is -- you would -- you would want to have 10:13:40
10 and need to have, with my interpretation of the 10:13:44
11 block being the block that's currently -- of 10:13:47
12 pixels currently being coded, whether or not you 10:13:49
13 would want to have a specific association of the 10:13:53
14 first -- the first spatial motion vector 10:13:57
15 prediction candidate with the location of the 10:13:59
16 block, and you would. 10:14:00
17 And you don't have that in Claim A, 10:14:04
18 even if a person of ordinary skill in the art 10:14:06
19 would have probably said, "Yeah, I -- I think 10:14:09
20 that's probably true." 10:14:10
21 I mean, the idea is -- in my 10:14:11
22 understanding of patent claims, the idea is to 10:14:13

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1 write it so that -- so that it's completely clear 10:14:15
2 and so that it's -- spells out every -- every 10:14:20
3 bell and whistle of what's being claimed in the 10:14:25
4 patent claim. 10:14:28
5 Q. Okay. Please turn to Figure 9, please, of 10:14:29
6 the '714 patent. 10:14:31
7 A. I'm there. 10:14:43
8 Q. As a person -- I'm not asking you as a 10:14:44
9 lawyer or a legal matter, but as a person of 10:14:48
10 skill in the art -- well, first, you agree you -- 10:14:51
11 you've qualified as a person of skill in the art 10:14:52
12 both at the time of the patent and -- and before 10:14:55
13 and after that? 10:14:57
14 A. Yes, I would agree with that. 10:14:57
15 Q. Okay. As a person of skill in the art, 10:14:58
16 looking at Figure 9 of the '714 patent, if you 10:15:02
17 wanted to describe the block from which the 10:15:06
18 motion vector prediction candidate -- well, let 10:15:10
19 me -- let me rephrase this. 10:15:15
20 You're here with me? You're looking 10:15:16
21 at Figure 9? 10:15:20
22 A. I am looking at Figure 9. I'm here with 10:15:21

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1 you. 10:15:24
2 Q. Okay. And we agree that one way of 10:15:24
3 describing the block labeled "900" in Figure 9 is 10:15:26
4 "current block"? 10:15:30
5 A. That seems like a reasonable describe -- a 10:15:31
6 reasonable description, yes. 10:15:33
7 Q. Okay. One way of describing the blocks 10:15:33
8 that are -- are labeled "901" through "905" -- or 10:15:37
9 I think we've used the term "neighboring blocks." 10:15:41
10 A. I would use the term "reference block." 10:15:44
11 Q. Would you understand what I meant if I -- 10:15:47
12 if I called those "neighboring blocks"? 10:15:50
13 A. Certainly; but, of course, one does not 10:15:51
14 have to use "neighboring blocks" as the 10:15:53
15 reference. So you can call them "neighboring 10:15:56
16 blocks." I can call -- I will call them 10:15:58
17 "reference blocks." 10:16:00
18 Q. Okay. And -- and in this case, in 10:16:00
19 Figure 9's context, blocks 901 through 905 are 10:16:04
20 both reference blocks, and because they relate to 10:16:10
21 spatial motion vector prediction candidates, 10:16:12
22 they're also neighboring blocks? 10:16:13

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1 A. Well, they -- they are neighboring blocks 10:16:15
2 and they are in the same frame, so they are 10:16:18
3 spatial neighbors. 10:16:22
4 Q. How would a person of skill in the art who 10:16:24
5 was writing a paper describe a particular block 10:16:29
6 from which one of the spatial motion vector 10:16:33
7 prediction candidates came in Figure 9? 10:16:37
8 A. They would probably say, "I had a spatial 10:16:41
9 motion vector candidate. I -- I took one out of 10:16:47
10 block A1 or block B2 or B1 or B0." 10:16:49
11 Q. And what if they wanted to leave undefined 10:16:53
12 which of A0, A1, B0, B1, B2 is, but they wanted 10:16:56
13 to make clear there is some relationship between 10:17:01
14 that block and a motion vector from which -- or 10:17:03
15 that -- that arose out of that block? How would 10:17:06
16 they describe such a block? 10:17:08
17 A. I think they would probably say, "We 10:17:10
18 select a motion vector from block A0, A1, B2, B1, 10:17:22
19 or B0 in some manner." 10:17:29
20 Q. Okay. Thank you. 10:17:31
21 MR. VERBONCOEUR: And we've been 10:17:33
22 going for a little over an hour, so I think now 10:17:34

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1 is an okay time for a break. 10:17:36
2 (Break taken from 10:17 a.m. to 10:17:39
3 10:29 a.m.) 10:29:56
4 (Whereupon Exhibit 5 was marked 10:29:56
5 for identification.) 10:29:56
6 MR. VERBONCOEUR: I'd like to 10:29:59
7 introduce as Exhibit 5 the Rusert patent. 10:30:01
8 Q. (BY MR. VERBONCOEUR) Okay. And you have 10:30:38
9 in front of you, Doctor, what's been marked as 10:30:39
10 Exhibit 5. 10:30:41
11 Do you recognize Exhibit 5 as the 10:30:42
12 Rusert reference? 10:30:44
13 A. Yes. 10:30:46
14 Q. Okay. And in Exhibit 5, Rusert, if we 10:30:47
15 look at the various Figure 3s on Page 3 of the 10:30:56
16 reference... 10:31:00
17 A. Yes, I'm looking at the Figure 3s. 10:31:01
18 Q. And do you agree that in the various 10:31:03
19 Figure 3s of Rusert, these are all different 10:31:07
20 possible scan patterns that Rusert discusses? 10:31:11
21 A. Well, not entirely. 10:31:35
22 If you read the description of -- 10:31:38

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1 of -- of Figure 3 in paragraph 30, Figures 3A 10:31:40
2 through 3N illustrate possible scan patterns and 10:31:48
3 distance measures for -- for a plurality of 10:31:53
4 surrounding -- blocks surrounding the current 10:31:56
5 block. 10:31:59
6 So some of these, for example, 3D, for 10:32:00
7 example, is clearly a -- a distance measure. 10:32:04
8 Q. That's fair. 10:32:08
9 So -- so the various Figure 3s will 10:32:09
10 either show you possible distance measures, for 10:32:13
11 example, Figure 3D, Figure 3F, or possible scan 10:32:15
12 patterns in Rusert, for example, Figure 3N? 10:32:19
13 A. Yes, that -- I would agree with that 10:32:23
14 statement. 10:32:24
15 Q. And going back to the '714 patent that was 10:32:24
16 marked as Exhibit 1 -- feel free to look at it if 10:32:32
17 you'd like, but we were just talking about Claim 10:32:36
18 23. 10:32:36
19 And there's a part of -- of Claim 23 10:32:39
20 that -- that says say "a set of spatial motion 10:32:41
21 vector prediction candidates," and I'd like to 10:32:47
22 ask you about that part of the claim in the 10:32:48

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1 context of Rusert. 10:32:50
2 A. So are you referring to claim limitation A 10:33:01
3 where it says, "a set of spatial motion vector 10:33:05
4 prediction candidates"? 10:33:09
5 Q. Yes, "a set of spatial motion vector 10:33:09
6 prediction candidates for an encoded block of 10:33:12
7 pixels." 10:33:14
8 Do you -- do you see that in the 10:33:14
9 claims of the '714 patent? 10:33:15
10 A. Yes, I do see it. 10:33:17
11 Q. Okay. I'd like to ask you about a set of 10:33:18
12 spatial motion vector prediction candidates for 10:33:21
13 an encoded block of pixels in the context of 10:33:22
14 Rusert. 10:33:25
15 A. Okay. 10:33:26
16 Q. And what is your view on, if any, the set 10:33:26
17 of spatial motion vector prediction candidates 10:33:33
18 for an encoded block of pixels in Rusert? What 10:33:36
19 is it? 10:33:40
20 A. Well, certainly. 10:33:41
21 And, in fact, since you're asking my 10:33:42
22 opinion, I think it's -- it's good to start with 10:33:43

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1 the -- with the information in my declaration. 10:33:45
2 Then we can go from there. 10:33:47
3 So in -- so I'm referring to -- to 10:33:49
4 begin with, let's take a look at paragraph 102 10:33:58
5 in -- in the -- what did we call it, the -- the 10:34:02
6 604 declaration, which is the one we're dealing 10:34:07
7 with here. 10:34:10
8 Okay. So 102 is related to the Claim 10:34:10
9 1 limitation -- this is related to claim 10:34:16
10 limitation 1A, but the language is -- is -- I 10:34:18
11 believe is essentially the same in claim 10:34:20
12 limitation 23A. 10:34:23
13 So just -- let me just read this to 10:34:24
14 begin with. "Ground one teaches selecting a 10:34:28
15 first spatial motion vector prediction candidate, 10:34:30
16 i.e. -- e.g., a PMV candidate" -- 10:34:40
17 THE COURT REPORTER: I.e. what? 10:34:40
18 THE WITNESS: Sorry, e.g. 10:34:40
19 A. -- "e.g., a PMV candidate" -- 10:34:40
20 (Reporter clarification.) 10:34:40
21 A. -- "from a set of spatial motion vector 10:34:49
22 prediction candidates," and then it goes, 10:34:53

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1 parentheses, "e.g., set of previously coded 10:34:54
2 motion vectors for a block of pixels." 10:34:58
3 For example, Rusert refers to a 10:35:01
4 predicted motion vector as a PMV and teaches, 10:35:04
5 quote, selecting dot, dot, dot, PMV candidates 10:35:09
6 from, quote, a set of previously-coded motion 10:35:13
7 vectors that were used for previous blocks. 10:35:19
8 And then I give a number of citations 10:35:21
9 to that. 10:35:23
10 So if we go to Rusert, Rusert -- 10:35:23
11 Rusert-- if we look -- if we look at some of 10:35:29
12 these citations -- so let's, for example, take a 10:35:35
13 look at -- in Rusert now, which is Exhibit 5 -- I 10:35:38
14 guess if we take a look at one of these 10:35:42
15 paragraphs -- let's look at paragraph 15. 10:35:48
16 So in paragraph 15, what Rusert says 10:35:52
17 is, "The method may comprise identifying allowed 10:35:57
18 positions of previous blocks and wherein the set 10:36:03
19 of PMV candidates comprises a subset of the set 10:36:06
20 of previously-coded motion vectors that were used 10:36:11
21 for previous blocks having allowed distance from 10:36:15
22 the current block and an allowed position." 10:36:18

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1 So now the question is: What is this 10:36:22
2 referring to? 10:36:25
3 So to see what this is referring to, 10:36:26
4 we can -- for example, in my -- in my deposition 10:36:29
5 [sic], if we go to the figures above paragraph 10:36:35
6 106, which are figures from Rusert -- so these 10:36:37
7 are Figures 3C and 3N. 10:36:40
8 This denotes what Rusert is -- is 10:36:44
9 referring to here, as far as this -- this idea of 10:36:49
10 where he says, "The selected set of PMV 10:36:53
11 candidates comprises a subset of the set of 10:36:56
12 previously-coded motion vectors." 10:37:00
13 So both Figure 3C and Figure 3N 10:37:01
14 illustrate such a set. 10:37:05
15 And in particular, in terms of Rusert, 10:37:07
16 let's take a look at Figure 3N. So that set, 10:37:10
17 then, the set of previously-coded motion vectors, 10:37:13
18 would be every -- so the dot in Figure 3N 10:37:17
19 represents the current block. 10:37:22
20 It would be every block shown in 10:37:23
21 this -- in this figure that does not have a dash, 10:37:26
22 so if it has a number, so 1, 2, 3, 4, up through 10:37:30

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1 letters F. 10:37:34
2 So -- and in -- in Figure 3C, that set 10:37:35
3 of -- of prediction motion vector candidates 10:37:41
4 would be -- again, the dot is the current -- the 10:37:47
5 current block, so every -- every labeled block 10:37:49
6 that has a number or a letter in Figure 3C. 10:37:54
7 Q. (BY MR. VERBONCOEUR) Okay. So in Rusert, 10:37:56
8 looking at, for example, Figure 3N, Rusert's set 10:38:01
9 of candidates would be -- each block that has 10:38:05
10 something other than a dash would comprise the 10:38:08
11 set of candidates? 10:38:11
12 A. Yes, the -- and at -- we've talked about 10:38:15
13 this before, but it would be the motion vectors 10:38:18
14 of those blocks, but, yes. 10:38:21
15 Q. Okay. And -- and for Figure 3C, each 10:38:24
16 motion vector associated with a block that has 10:38:28
17 something other than a dash would be the set of 10:38:30
18 candidates in Rusert? 10:38:33
19 A. That is -- that is correct, yes. 10:38:35
20 Q. Okay. Okay. Now I'd like to ask you -- 10:38:37
21 we'll -- we'll revisit Rusert, but I'd like to 10:38:52
22 turn back to the '714 patent now. 10:38:54

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1 Okay. So, Doctor, we've been using 10:39:03
2 Claim 23 as our representative claim here; so I'd 10:39:33
3 like to revisit that, and I'd like to look at the 10:39:36
4 "compare motion information" limitation. 10:39:40
5 Let me know when you're able to see 10:39:43
6 that. 10:39:48
7 A. Sure. I'm just rereading it for my own 10:39:48
8 edification first. 10:39:51
9 (Witness reviewing the document.) 10:39:51
10 Okay. 10:40:02
11 Q. Okay. And -- and we're looking at Claim 10:40:02
12 23; but every independent claim has a limitation 10:40:05
13 that says "compare" or "comparing motion 10:40:07
14 information" and then dot, dot, dot. 10:40:10
15 A. I agree. Every independent -- every 10:40:13
16 independent claim has this or it has 10:40:16
17 an equivalent -- equivalent claim limitation. 10:40:21
18 Q. Okay. Thank you. 10:40:23
19 And so I want to get your take on what 10:40:24
20 this limitation means. 10:40:27
21 And here we've got a verb, "compare 10:40:28
22 motion information of the first spatial motion 10:40:31

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1 vector prediction candidate with motion 10:40:35
2 information of the spatial motion vector 10:40:37
3 prediction candidate in the determined subset." 10:40:39
4 Do you see that? 10:40:41
5 A. I do. 10:40:42
6 Q. And -- and so here what we're talking 10:40:43
7 about is a particular spatial motion vector 10:40:46
8 prediction candidate, the first one, and it's 10:40:48
9 being compared to something that's in the subset. 10:40:50
10 A. I agree. 10:40:54
11 It -- the -- you have the first 10:40:55
12 spatial motion vector prediction candidate, and 10:40:57
13 it's -- it is being compared to a spatial motion 10:40:59
14 vector prediction candidate that's in the 10:41:05
15 determined subset. 10:41:05
16 Q. Okay. And now I want to look at the -- 10:41:06
17 the next limitation that says, "determine to 10:41:09
18 include or exclude the first spatial motion 10:41:15
19 vector prediction candidate in the motion vector 10:41:18
20 prediction list based on comparison of the motion 10:41:21
21 information of the first spatial motion vector 10:41:24
22 prediction candidate with motion information of 10:41:28

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1 the spatial motion vector prediction candidate." 10:41:30
2 Do you read the "determine to include 10:41:31
3 or exclude based on comparison" to refer back to 10:41:34
4 the "comparing motion information" limitation 10:41:38
5 that we just looked at before? 10:41:39
6 A. Let me take a look at my declaration. 10:41:46
7 Yes, I -- I would agree that the 10:43:10
8 determination in that claim limitation is based 10:43:12
9 on the comparison done in the previous claim 10:43:20
10 limitation. 10:43:24
11 Q. Okay. Thank you. 10:43:24
12 And now let's go back to the "compare 10:43:25
13 motion information" limitation, because I only 10:43:29
14 read part of it. 10:43:31
15 That limitation says, "compare motion 10:43:32
16 information of the first spatial motion vector 10:43:35
17 prediction candidate with motion information of 10:43:38
18 the spatial motion vector prediction candidate in 10:43:40
19 the determined subset of spatial motion vector 10:43:42
20 prediction candidates without making a comparison 10:43:47
21 of each possible candidate pair from the set of 10:43:48
22 spatial motion vector prediction candidates." 10:43:52

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1 Do you see that? 10:43:52
2 A. Yes, I do. 10:43:55
3 Q. And specifically, I want to ask you about 10:43:58
4 the part of the limitation "without making a 10:44:01
5 comparison of each possible candidate pair from 10:44:03
6 the set of spatial motion vector prediction 10:44:06
7 candidates." 10:44:06
8 Is it your opinion that that part 10:44:08
9 modifies the "compare motion information" action 10:44:11
10 that's being required here by this limitation? 10:44:14
11 A. So you are asking if -- does the -- 10:44:29
12 without making a comparison of each possible 10:44:33
13 candidate pair from the set of spatial motion 10:44:38
14 vector prediction candidates, if -- you're asking 10:44:40
15 if that modifies the "compare motion vector" 10:44:42
16 information of the first motion vector prediction 10:44:47
17 candidate? Is that what you're asking? 10:44:50
18 Q. That's right. 10:44:51
19 A. Yeah, I -- I think it -- it does modify 10:44:52
20 it. Yeah, I believe so. 10:44:55
21 Q. Thank you. 10:44:56
22 And -- and so now I'd like to get your 10:44:59

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1 take on what it means to be each possible 10:45:01
2 candidate pair. 10:45:04
3 What's your understanding of that 10:45:05
4 term, "possible candidate pair"? 10:45:07
5 A. Well, I mean, I -- I think -- I think 10:45:10
6 we -- I can't really define that term without 10:45:17
7 looking at the overall limitation, so, you know, 10:45:20
8 in more -- more complete -- in complete 10:45:21
9 structure. 10:45:23
10 So it's saying -- it says -- so the 10:45:23
11 full limitation is, "compare motion information 10:45:26
12 of the first spatial motion vector prediction 10:45:28
13 candidate with motion information of the spatial 10:45:31
14 motion vector prediction candidate in the 10:45:36
15 determined subset of spatial motion vector 10:45:36
16 prediction candidates without making a comparison 10:45:41
17 of each possible candidate pair from the set of 10:45:42
18 spatial motion vector prediction candidates." 10:45:47
19 So my interpretation of that entire -- 10:45:48
20 entire statement is that -- is that you have a 10:45:52
21 set of spatial motion vector prediction 10:45:57
22 candidates. You have a first motion vector 10:46:00

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1 prediction candidate. 10:46:06
2 So let's say the set included ten 10:46:06
3 spatial motion vector prediction candidates. 10:46:10
4 Then you would not compare it to each of those 10:46:11
5 ten. So you wouldn't compare it to candidate -- 10:46:14
6 the first one. You wouldn't compare it to the 10:46:17
7 candidate number one and then compare it to 10:46:19
8 candidate number two and then compare it to 10:46:22
9 candidate number three, et cetera, you know, and 10:46:24
10 compare it to every candidate in that set. 10:46:27
11 Q. Okay. And -- and I -- I think this gets 10:46:29
12 to the crux of the matter. 10:46:32
13 Do you see "possible candidate pair" 10:46:33
14 as being defined with respect to the determined 10:46:37
15 subset for which the comparison is -- or with 10:46:40
16 which the comparison is being done, or do you see 10:46:42
17 that as defined with respect to just every member 10:46:45
18 of the set? 10:46:48
19 A. Again, if I read this, it says -- just the 10:46:51
20 last part this time, so doing the compare -- 10:46:54
21 so -- well, it's "compare motion information of 10:46:59
22 the first motion vector prediction candidate with 10:47:02

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1 motion information of the spatial motion vector 10:47:04
2 prediction candidate in the determined subset of 10:47:09
3 spatial motion vector prediction candidates 10:47:13
4 without making comparison to each possible pair 10:47:17
5 of spatial motion vec- -- pair from the set of 10:47:20
6 spatial motion vector prediction candidates." 10:47:25
7 So -- so my interpretation of this is 10:47:26
8 that -- is that you do not compare the first 10:47:29
9 spatial motion vector prediction candidate to all 10:47:35
10 of the candidates in the set. 10:47:38
11 Q. And the reason I'm asking this is because 10:47:44
12 I'm wondering what meaning the -- the word 10:47:47
13 "possible" has in that context, because, of 10:47:50
14 course, if you have a set of candidates, all -- 10:47:53
15 the set of all potential pairs will just be every 10:47:57
16 permutation of two members of the set; whereas, 10:48:01
17 one -- the other way of reading this limitation 10:48:05
18 is that the set -- or "without making comparison 10:48:08
19 of each possible candidate pair" refers to the 10:48:10
20 possible candidate pair as based on the 10:48:13
21 determined subset. 10:48:16
22 MR. LIANG: Objection to form. 10:48:25

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1 A. I think -- I -- I -- I don't -- I don't 10:48:29
2 see that -- that "possible" really has any impact 10:48:31
3 on my opinion. 10:48:38
4 I mean, if we go back to the first 10:48:38
5 claim limitation, right, the first claim 10:48:41
6 limitation says that, "select a first spatial 10:48:44
7 motion vector prediction candidate -- prediction 10:48:50
8 candidate from a set of spatial motion vector 10:48:51
9 prediction candidates for an encoded block." 10:48:54
10 So we have a set, right? We have a 10:48:56
11 set of spatial motion vector prediction 10:48:58
12 candidates as a potential spatial motion vector 10:49:00
13 prediction candidates [sic] to be included in a 10:49:04
14 motion vector prediction list. Okay? And the 10:49:07
15 rest of it's not really germane. 10:49:09
16 So limitation two is, "determine a 10:49:12
17 subset of spatial motion vector prediction 10:49:15
18 candidates." 10:49:17
19 So the clear implication here is that 10:49:17
20 subset is a subset of the set from which the 10:49:20
21 first spatial motion vector prediction candidate 10:49:23
22 was selected. 10:49:25

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1 So now we go down to the 10:49:26
2 "determination" limitation. It says, very 10:49:29
3 clearly, that we are going to "determine to 10:49:33
4 include or -- or exclude the first spatial motion 10:49:36
5 vector prediction candidate in the motion -- in 10:49:41
6 the motion vector prediction list based on 10:49:44
7 comparison of the first" -- sorry -- "comparison 10:49:47
8 of the motion information of the first spatial 10:49:52
9 motion vector prediction candidate with motion 10:49:56
10 information of -- of -- spatial motion" -- okay. 10:49:58
11 So, yeah, "with motion information of 10:50:04
12 the spatial motion vector prediction candidate." 10:50:07
13 Sorry, we've got to go -- I skipped 10:50:08
14 one down. 10:50:10
15 Okay. So the comparison is done 10:50:11
16 based, as you said, on the limitation above. 10:50:13
17 That was the one I meant to read. 10:50:15
18 So "compare motion information of the 10:50:17
19 first spatial motion vector prediction candidate 10:50:20
20 with motion information of the spatial motion 10:50:21
21 prediction candidate -- motion vector prediction 10:50:26
22 candidate in the determined subset." 10:50:28

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1 So clearly, that subset, based on the 10:50:30
2 limitation above, was extracted from a set that 10:50:32
3 was defined in the first claim limitation from 10:50:35
4 which the first spatial motion vector prediction 10:50:39
5 candidate was selected. 10:50:41
6 And then it says, further on, "without 10:50:42
7 making a comparison of each possible candidate 10:50:46
8 pair from the set" -- so possible pairs from the 10:50:51
9 set. That set is the set from which the subset 10:50:54
10 itself was derived of the spatial motion vector 10:50:58
11 prediction candidates. 10:51:01
12 Q. (BY MR. VERBONCOEUR) All right. And so I 10:51:03
13 think you understand the two ways of reading 10:51:05
14 this, one being, when it says "each possible 10:51:06
15 candidate pair," that's referring to the -- the 10:51:10
16 possible comparisons that could be done; and then 10:51:12
17 the other is, you know, if we start with the set, 10:51:14
18 what are all of the potential pairs you might 10:51:19
19 come up with based on the overall set. 10:51:21
20 And -- and I think you -- you're 10:51:23
21 saying you interpret that phrase, "each possible 10:51:25
22 candidate pair," to refer to the -- the latter 10:51:28

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1 interpretation; that is, what are all the 10:51:30
2 possible permutations we could have of a given 10:51:32
3 set of candidates. 10:51:34
4 A. I believe I've said -- I refer that -- 10:51:36
5 in -- in the case of -- of -- do not make a 10:51:38
6 comparison. 10:51:41
7 So, again, if -- you know, if we look 10:51:41
8 at -- if we look at, say, Figure 3N of Rusert, 10:51:43
9 right, and then we -- we look at the set as 10:51:50
10 including all of the numbered and lettered 10:51:53
11 blocks, then I would count one, two, three, four, 10:51:55
12 five, six, seven, eight, nine, ten, eleven, 10:51:58
13 twelve, thirteen, fourteen, fifteen -- I think 10:52:02
14 I -- I count fifteen -- fifteen blocks in the 10:52:05
15 set. 10:52:07
16 So my interpretation of -- with 10:52:08
17 respect to that, if -- if we're looking at that 10:52:11
18 example -- so our set would include fifteen 10:52:13
19 blocks that contain -- that could contain 10:52:20
20 predicted motion vectors. 10:52:26
21 And in terms of this limitation of not 10:52:26
22 making comparisons to all -- all possible 10:52:28

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1 candidates in the set, I would say that means 10:52:31
2 that you have your first motion vector candidate 10:52:33
3 and you don't compare it to all of those fifteen 10:52:36
4 things. You don't compare it to one and compare 10:52:38
5 it to two and compare it to three and compare it 10:52:41
6 to four. 10:52:43
7 Q. And, Doctor, I see you have the -- your 10:52:43
8 604 declaration in front of you. 10:52:46
9 Can you -- can you please let me know 10:52:48
10 what -- what paragraph you just referred to when 10:52:49
11 looking at -- 10:52:52
12 A. Sure. 10:52:52
13 Well, I'm looking at -- I'm actually 10:52:52
14 looking at the -- just the annotated version of 10:52:53
15 3N; but actually, that refers to paragraph 130 -- 10:52:57
16 Q. Okay. 10:53:00
17 A. -- which -- which basically looks at -- 10:53:00
18 which considers the status -- considers 10:53:05
19 that which -- it shows my analysis of how Rusert 10:53:10
20 satisfies Claim 1B with respect to the 10:53:13
21 alternative block definition proposed by the 10:53:16
22 PTAB, which basically says that -- if we go 10:53:22

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1 through this -- I'll read it for you, since I was 10:53:25
2 referring to it. 10:53:28
3 So the text is, (as read) 10:53:29
4 Alternatively, if "the block" were interpreted to 10:53:30
5 mean the block of pixels from the selected 10:53:35
6 first -- from which the first vector -- first 10:53:38
7 candidate was obtained, Rusert also teaches this. 10:53:42
8 For example, Rusert teaches that a "position" of 10:53:45
9 a block of PM -- of a PMV candidate is expressed 10:53:47
10 as, parenthesis, xpos, comma, ypos, denoting a 10:53:55
11 coordinate comprising an X-coordinate and a 10:53:58
12 Y-coordinate of the block, i.e., a location of 10:54:00
13 the block associated with the first spatial 10:54:03
14 motion vector prediction candidate. 10:54:06
15 Based on the location of the block of 10:54:07
16 the PMV candidate, Rusert teaches that the subset 10:54:09
17 of PMV candidates with which the block -- with 10:54:13
18 which the PMV candidate is compared includes the 10:54:17
19 PMV candidates of blocks located in the scan 10:54:22
20 pattern up to the PMV candidate; for example, 10:54:24
21 following... 10:54:27
22 And this is the -- the -- this example 10:54:27

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1 is what I referred to, the figure I referred to. 10:54:29
2 (As read) For example, following the 10:54:31
3 scan pattern of -- illustrated in Figure 3N, the 10:54:33
4 PMV candidate associated with the block located 10:54:38
5 at 3 -- located at 3 would be compared with a 10:54:41
6 subset of PMV candidates that include the PMV 10:54:44
7 candidates of blocks 1 and 2, as illustrated 10:54:48
8 below. 10:54:51
9 Q. Okay. And so looking at your annotated 10:54:51
10 version of Figure 3N of Rusert that appears below 10:54:55
11 paragraph 130 of your declaration, you've 10:54:59
12 identified Rusert's 1 and 2 as the subset of what 10:55:02
13 you point to as a first spatial motion vector 10:55:06
14 prediction candidate labeled "3"? 10:55:10
15 A. At that point in the processing, that's 10:55:12
16 correct. 10:55:14
17 Now, it's -- it's -- it should be 10:55:14
18 noted that, again, this processing is dynamic. 10:55:16
19 So, for example, if the first motion 10:55:19
20 vector prediction candidate was actually block 2, 10:55:23
21 then the subset would consist of block 1, motion 10:55:25
22 vector information from block 1. 10:55:30

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1 If, on the other hand, it was block 4, 10:55:32
2 then the subset would consist of the motion 10:55:34
3 information from blocks 1, 2, and 3. 10:55:36
4 Q. Okay. And if we're looking at a first 10:55:38
5 spatial motion vector prediction candidate of 10:55:43
6 block 2, you agree that in Rusert, looking at 10:55:45
7 Figure N -- 3N, the subset would be block 1? 10:55:49
8 A. If the first spatial motion vector 10:55:52
9 prediction candidate is block 2, then the subset 10:55:56
10 would be block 1. 10:55:58
11 Q. And the way Rusert works, by the time you 10:55:59
12 get to block 2 in the scan order, the only block 10:56:03
13 that has been processed to date is block 1? 10:56:07
14 A. Well, that -- that is clearly correct. 10:56:13
15 Rusert's -- Rusert starts -- Rusert follows the 10:56:16
16 scan pattern, as denoted by the numeric order of 10:56:19
17 these blocks, prior to going into lettering of 10:56:22
18 the blocks. 10:56:24
19 Q. Okay. 10:56:24
20 A. And so block 1 will be considered first, 10:56:25
21 block 2 will be considered next, and so on. 10:56:30
22 Q. And Rusert discloses that you follow the 10:56:32

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1 scan order in order; that is, you do 1, 2, and 3, 10:56:36
2 4, et cetera. And Rusert doesn't say anything 10:56:39
3 about disregarding that order? 10:56:42
4 A. Well, Rusert -- I should point out, 10:56:47
5 Rusert -- Rusert says that you -- that you -- 10:56:50
6 that you follow a scan pattern that is based on 10:56:52
7 the location of the current block or, in this 10:56:59
8 case, in this -- in this -- in this discussion, 10:57:01
9 actually based on the location of the first -- 10:57:03
10 the block corresponding to the first prediction 10:57:07
11 candidate, because while these -- these 10:57:10
12 numbers -- these -- these things -- these -- 10:57:15
13 these blocks are labeled numerically. These 10:57:16
14 blocks correspond to spatial locations in the -- 10:57:21
15 in the -- in the -- in the image, in the -- in 10:57:25
16 the image block. In fact, I have a pretty nice 10:57:30
17 diagram of that here somewhere. 10:57:33
18 So if we look at Figure 3N, I think 10:57:37
19 that shows the process very clearly. This is -- 10:57:42
20 I'm sorry, Figure 3N. This is on page -- this is 10:57:46
21 above paragraph 108. It is Figure 3N on there, 10:57:48
22 but it's an annotated version. 10:57:52

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1 And what it shows is it shows the 10:57:53
2 Rusert scan pattern with the numeric values, but 10:57:55
3 it shows that those numeric values form a spiral 10:57:59
4 relative to the previously-encoded blocks. 10:58:02
5 A spiral -- the spiral clearly shows 10:58:05
6 that the numeric values are related to the 10:58:07
7 location of -- the relative locations of these 10:58:10
8 previously-encoded blocks. 10:58:14
9 Q. Right. 10:58:15
10 So let's go back to the annotated 10:58:16
11 version of Figure 3N that you have below 10:58:18
12 paragraph 130 of your declaration. 10:58:20
13 A. Okay. 10:58:22
14 Q. And following that spiral pattern, when 10:58:22
15 we're looking at a first spatial motion vector 10:58:26
16 prediction candidate labeled "2" at that 10:58:28
17 location, the only location that's been processed 10:58:30
18 at that point is 1? 10:58:33
19 A. I -- I already answered that question. I 10:58:37
20 already -- I already agreed that, yes, at that 10:58:40
21 point, the only location that had been processed 10:58:41
22 is 1. It's a dynamic process, so it's going 10:58:44

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1 to -- 10:58:44
2 Q. Right. 10:58:44
3 A. -- going to -- going to continue, you 10:58:48
4 know, until it fills up its list to the maximum 10:58:48
5 value. 10:58:51
6 Q. In looking at Rusert's Figure 3N, the only 10:58:52
7 comparison that would be possible in Rusert's 10:58:55
8 system, using the scan pattern of Figure 3N when 10:58:58
9 you're processing block 2, is a comparison with 10:59:01
10 block 1. 10:59:04
11 A. That's correct. 10:59:06
12 So when we are at block 2, we've 10:59:07
13 already processed block 1. What we'll do is 10:59:10
14 we'll do a comparison. We will compare the 10:59:13
15 motion information from block 2 to the motion 10:59:16
16 information from block 1. 10:59:20
17 Q. All right. And in -- if our first spatial 10:59:21
18 motion vector prediction candidate is 3, which is 10:59:26
19 the example you have here below paragraph 130 of 10:59:29
20 your declaration, the only possible comparisons 10:59:32
21 that can be done are to 2 and 1? 10:59:35
22 A. At block 3 the -- the subset will consist 10:59:41

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1 of block -- of the motion information 10:59:45
2 corresponding to blocks 1 and 2. 10:59:48
3 So you would do the comparison with a 10:59:50
4 subset that includes motion information from 10:59:52
5 blocks [sic] 1 and block 2. 10:59:56
6 Q. Okay. And looking at your example of 10:59:57
7 Figure 3N, when Rusert is processing block 3, it 11:00:00
8 doesn't know anything about blocks 4, 5, and 6. 11:00:04
9 So obviously, those aren't possible comparisons 11:00:06
10 at that point? 11:00:10
11 MR. LIANG: Objection to form. 11:00:10
12 A. I'm not sure that's -- that's -- in fact, 11:00:13
13 I don't -- I don't agree that's an accurate 11:00:16
14 statement. 11:00:18
15 Rusert -- so Rusert proposes multiple 11:00:18
16 scan orders that are all based on spatial 11:00:25
17 locations relative to the current block being 11:00:28
18 encoded. 11:00:31
19 3N represents one of those scan 11:00:32
20 orders. We looked at 3D earlier. That 11:00:34
21 represents another scan order. 11:00:37
22 But that scan order, once you 11:00:38

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1 select -- so Rusert -- Rusert envisions having -- 11:00:41
2 and discusses having multiple scan orders and, in 11:00:44
3 fact, says, you know, 3N -- Rusert ultimately 11:00:48
4 concludes that 3N is a much better scan order 11:00:52
5 choice than -- for example, if we look at Rusert, 11:00:55
6 Rusert also proposes a scan order of 3M, which is 11:00:58
7 not -- which I don't directly cite in my -- in 11:01:02
8 my -- in my declaration. 11:01:06
9 But what Rusert says, 3M has far more 11:01:07
10 potential prediction motion vectors in it than 3N 11:01:13
11 does; and Rusert says, well, 3M is great, but the 11:01:17
12 complexity -- the computation complexity of 11:01:21
13 implementing it would be too high. 11:01:24
14 So Rusert proposes 3N as a compromise 11:01:26
15 that would give good performance with more 11:01:29
16 reasonable computation complexity. 11:01:32
17 So Rusert does propose a number of 11:01:36
18 scan orders; but once you have fixed the scan 11:01:40
19 order, once you have -- once you have the scan -- 11:01:42
20 the scan order, then this -- then the locations 11:01:44
21 of all of these blocks is all a priori. 11:01:48
22 So even though at block 3 we have not 11:01:52

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1 yet considered block 4 or block 5, we know -- you 11:01:55
2 could say block 3 knows where block 4 and block 5 11:02:00
3 are spatially located relative to itself because 11:02:03
4 that scan order has been fixed in any given 11:02:06
5 realization of Rusert. 11:02:10
6 Q. (BY MR. VERBONCOEUR) So once we fix the 11:02:11
7 scan order in Rusert, there's some a priori 11:02:13
8 knowledge of where blocks 4, 5, and 6 will be; 11:02:17
9 but the scan order dictates the processing order 11:02:20
10 such that block 3 is -- is going to be compared 11:02:23
11 to blocks 2 and 1 if they're available? 11:02:25
12 A. I can say that -- that block 3 will 11:02:30
13 definitely be compared to blocks [sic] 2 and 11:02:34
14 block 1; and block 3 will not, in the Rusert 11:02:37
15 realization, be compared at that time to block 4. 11:02:42
16 Now, when you move on, when you move 11:02:47
17 on to the next element -- let's -- let's say 11:02:50
18 you're -- you're -- you're allowing your final 11:02:52
19 prediction list -- you know, the endpoint of PMV 11:02:55
20 cans when you've completed this process, let's 11:03:00
21 say you're allowing it to have up to five 11:03:03
22 predicted motion vectors, then, you know, let's 11:03:05

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1 assume that blocks 1, 2, and 3 have all been 11:03:09
2 entered and were acceptable. 11:03:12
3 Then block 4 will then be compared to 11:03:14
4 block 3 and -- to determine whether or not it -- 11:03:17
5 it is entered into the -- into the list -- well, 11:03:20
6 subset at this point, will end up being the final 11:03:23
7 list when we're finished with this process. 11:03:27
8 And then if we allow ourselves up to 11:03:29
9 five, then block 5 would also be considered. 11:03:31
10 Q. Right. 11:03:34
11 I'm going to go back to the '714 11:03:36
12 patent that I've marked as Exhibit 1 and ask you 11:03:45
13 your interpretation about another part of the 11:03:47
14 claim. 11:03:51
15 A. Well, I'm in the '71 -- '714 patent, so... 11:03:54
16 Q. Okay. And let's just use Claim 23 because 11:03:56
17 we've been referring to that claim. 11:03:59
18 Specifically I want to ask you about 11:04:01
19 the "determine a subset of spatial motion vector 11:04:03
20 prediction candidates based on the location of 11:04:07
21 the block associated with the first spatial 11:04:08
22 motion vector prediction candidate." 11:04:11

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1 And -- and -- and we've talked a lot 11:04:11
2 about the block associated with the first spatial 11:04:13
3 motion vector prediction candidate, but I want to 11:04:17
4 get your take on the phrase "based on." 11:04:18
5 What would a person of skill in the 11:04:20
6 art, reading "based on," understand that to mean? 11:04:22
7 A. "Based on" is a -- is a very, sort of 11:04:33
8 generic and nebulous term. It doesn't have any 11:04:36
9 special meaning to somebody -- in this context, 11:04:39
10 to somebody who's a person of ordinary skill in 11:04:41
11 the art. 11:04:41
12 So I don't know that -- that such a 11:04:44
13 person would infer any -- any special meaning 11:04:46
14 there, other than the fact that there has to be 11:04:49
15 some relationship between -- between the -- the 11:04:51
16 subset and the location associated with the 11:05:00
17 block -- the location of the block associated 11:05:08
18 with the -- the first spatial motion vector 11:05:10
19 prediction candidate. 11:05:13
20 So I -- I believe that the only thing 11:05:13
21 that a person of ordinary skill in the art would 11:05:16
22 infer from this is that there is some relation 11:05:18

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1 between them, but -- but not what kind of 11:05:22
2 relation that would be. 11:05:25
3 Q. So -- so you don't think that the "based 11:05:25
4 on" language in the "determine a subset" 11:05:29
5 limitation requires, like, a one-to-one 11:05:32
6 correspondence between a subset and the location 11:05:34
7 of the block associated with the first spatial 11:05:36
8 motion vector prediction candidate? 11:05:41
9 A. I don't see that it -- it's -- it's -- if 11:05:41
10 you -- it does not require that. I mean, no 11:05:43
11 person of ordinary skill in the art would 11:05:45
12 interpret it as requiring that. 11:05:48
13 That's -- that's -- it requires that 11:05:49
14 there be a relationship, but -- but without 11:05:50
15 defining that relationship, I believe that the 11:05:53
16 relationship is open. 11:05:55
17 Q. Okay. So it would be -- I guess from that 11:05:56
18 perspective of this "determine a subset" 11:06:00
19 limitation, the limitation that read "determine a 11:06:03
20 subset of spatial motion vector prediction 11:06:07
21 candidates based, at least partly, on the 11:06:08
22 location of the block associated with the first 11:06:10

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1 spatial motion vector prediction candidate" would 11:06:12
2 be, in effect, identical to "determine a subset 11:06:13
3 of spatial motion vector prediction candidates 11:06:17
4 based on the location of the block associated 11:06:18
5 with the first spatial motion vector prediction 11:06:21
6 candidate"? 11:06:23
7 A. I think -- I think -- I think -- so I 11:06:23
8 think if you look at the '714 patent embodiments 11:06:30
9 and you look at how it's working, what you see is 11:06:34
10 that the subset determination process is an 11:06:38
11 adaptive process, right? 11:06:42
12 In other words, it's -- it -- even 11:06:44
13 within the '7 -- '714 embodiment, it's using the 11:06:46
14 locations of the blocks; but what actually gets 11:06:50
15 into the subset is determined by the contents of 11:06:56
16 those blocks, right, because you're doing the 11:06:59
17 comparison. 11:07:02
18 You're using -- you're using the 11:07:02
19 locations. You're doing a comparison; and when 11:07:03
20 you do that comparison, you figure out whether or 11:07:06
21 not B0 or B1 gets into the subset. 11:07:09
22 So I do believe that that -- even 11:07:12

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1 within the embodiment of the '7 -- '714 patent, 11:07:15
2 what ends up in that subset is not determined 11:07:19
3 only by the location of the block -- of the 11:07:21
4 blocks, the various blocks involved -- in 11:07:25
5 particular, in this case, the location associated 11:07:29
6 with the -- with the block corresponding to the 11:07:30
7 first spatial motion vector prediction candidate. 11:07:33
8 But what ends up in the subset is also 11:07:36
9 determined by what is in -- the motion vectors in 11:07:39
10 those blocks because the comparisons that you're 11:07:44
11 doing will decide who gets into the subset and 11:07:47
12 who doesn't. 11:07:49
13 Q. And I may be misunderstanding your 11:07:50
14 testimony here, Doctor; but the way I read the 11:07:54
15 claim, the "determine a subset" happens before 11:07:57
16 the "compare motion information" step. 11:07:59
17 Do you have that same understanding of 11:08:02
18 the '714 patent claims? 11:08:04
19 A. Well, it's -- the -- the -- the -- the 11:08:05
20 claim limitation certainly states -- states that 11:08:09
21 the determination of the subset happens before 11:08:11
22 that. 11:08:13

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1 However, just as Rusert is a -- is an 11:08:14
2 iterative process, going through, you know, 11:08:20
3 selective -- a selective set of tests based on 11:08:24
4 the spatial location of the first motion vector 11:08:27
5 prediction, as I described with respect to my 11:08:31
6 paragraph 130 before, '714 does the same kind of 11:08:32
7 thing. 11:08:36
8 So -- so the first time you go through 11:08:36
9 this, right, you're going to have nothing in the 11:08:38
10 subset, and you're going to then do a comparison 11:08:42
11 to put something into the subset, but you're 11:08:45
12 going -- going to go through it again. 11:08:49
13 And what was in that subset from the 11:08:50
14 first time, right, depending on what your 11:08:51
15 comparisons did the first time, is going to 11:08:54
16 affect what's in the subset when you do it for 11:08:57
17 the next motion -- for the next first motion 11:08:59
18 vector prediction vector -- spatial motion vector 11:09:04
19 prediction candidate, sorry. 11:09:08
20 Q. I think I agree with you, that's certainly 11:09:13
21 true in Rusert; that is, the way that you've 11:09:15
22 interpreted Rusert, Doctor, that what will be the 11:09:18

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1 subset will be based on prior processing done 11:09:20
2 at -- to the point where you reach the -- the 11:09:25
3 first spatial motion vector prediction candidate. 11:09:28
4 And so to clarify with an example, by 11:09:29
5 the time we reach the -- candidate 3 in Rusert 11:09:32
6 using Figure 3N, we would have done some 11:09:37
7 processing on 1 and 2. 11:09:40
8 And depending on 1 and 2 and whether 11:09:41
9 they're the same or sufficiently similar or 11:09:43
10 available, that's going to help us inform our 11:09:45
11 choice of subset 3. 11:09:48
12 Do you agree with that? 11:09:49
13 A. Oh, for Rusert? 11:09:49
14 Q. Yes. 11:09:51
15 A. Yeah, I agree with that on -- with respect 11:09:51
16 to Rusert. 11:09:53
17 Q. Okay. And to some extent -- now I'm going 11:09:54
18 to refer to the Nakamura reference. 11:09:56
19 That's -- that's also true of the 11:09:58
20 Nakamura reference, where we have S0 and S1; and 11:09:59
21 if we're identifying S1 as the first spatial 11:10:03
22 motion vector prediction candidate, what exists 11:10:06

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1 in the subset of S0 will depend on some prior 11:10:08
2 processing before we get to S1 in Nakamura's 11:10:11
3 order. 11:10:14
4 A. I -- I believe it's accurate, yeah. S0 11:10:16
5 will be filled first, yeah, and then -- and 11:10:20
6 then -- and we don't know what's going to be a 11:10:24
7 priori, right? 11:10:27
8 So then you'll -- you'll have -- 11:10:28
9 you'll -- you'll evaluate candidates for S1. 11:10:29
10 MR. VERBONCOEUR: I'd like to ask 11:10:34
11 you some more specific questions in Rusert, but 11:10:35
12 we've been going for about another hour, so I 11:10:38
13 could use a quick break. 11:10:41
14 (Break taken from 11:10 a.m. to 11:10:43
15 11:25 a.m.) 11:25:11
16 Q. (BY MR. VERBONCOEUR) Welcome back, 11:25:18
17 Doctor. 11:25:25
18 A. Thank you. 11:25:25
19 Q. All right. So, you know, I -- before you 11:25:26
20 left, I was going to talk to you about the way 11:25:29
21 Rusert works. 11:25:31
22 And -- and you've got Figure 3N 11:25:32

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1 annotated below paragraph 130 of your 11:25:36
2 declaration. I think -- I think we can use that, 11:25:38
3 sort of, just to talk through it. 11:25:41
4 And what I'd like to talk about is, 11:25:42
5 like, a -- a scenario where we've got a maximum 11:25:47
6 of five motion vectors that could be in our PMV 11:25:50
7 cans list. 11:25:54
8 Does that make sense to you? 11:25:55
9 MR. LIANG: Objection to form. 11:25:56
10 A. We can talk about any scenario you want; 11:25:58
11 but, of course, Rusert does not -- does not even 11:26:01
12 present an embodiment that has five maximum -- 11:26:05
13 five vector candidate -- vector -- motion vector 11:26:11
14 candidates in its list. 11:26:13
15 Q. (BY MR. VERBONCOEUR) My question may have 11:26:14
16 been imprecise. 11:26:15
17 I -- would you agree that Rusert does 11:26:17
18 describe imposing scan limits? 11:26:20
19 A. Yes, Rusert does -- does -- does present 11:26:21
20 the idea of having a maximum scan limit size. 11:26:25
21 Q. Okay. So let's assume for -- for purposes 11:26:29
22 of talking through Figure 3N, so that we don't 11:26:32

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1 have to go through all the examples, that -- that 11:26:36
2 Rusert is using a scan limit of five here. 11:26:39
3 A. Okay. 11:26:41
4 Q. And looking at Figure 3N of Rusert, we 11:26:44
5 would start with a PMV cans list of -- with 11:26:48
6 nothing on it; and then if block 1 was present 11:26:52
7 and had an -- an associated motion vector, then 11:26:55
8 1's motion vector is now added to the PMV cans 11:26:59
9 list? 11:27:05
10 A. That is correct so far, yes. 11:27:05
11 Q. And now what Rusert does, using Figure 3N 11:27:06
12 as an example, is that it looks to block 2; and 11:27:09
13 it needs to process whether to include the motion 11:27:12
14 vector associated with block 2 to the PMV cans 11:27:16
15 list. 11:27:20
16 And -- and to figure that out, it does 11:27:20
17 a comparison between 2 and 1, which is already on 11:27:23
18 the can -- the PMV cans list? 11:27:26
19 A. It will compare -- it will compare -- it 11:27:28
20 will do a -- compare the pairs of 1 and 2, yes. 11:27:32
21 Q. And I believe you noted this in your 11:27:34
22 declaration, but a comparison in Rusert can take 11:27:37

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1 a couple of different flavors: For example, it 11:27:39
2 could look to see whether the motion vectors are 11:27:42
3 exactly identical or whether they're just really 11:27:44
4 close. 11:27:46
5 And if it satisfies whichever 11:27:47
6 condition is being used, then it will decide 11:27:48
7 whether to -- you know, whether 2 goes on the 11:27:49
8 list, too, if it's sufficiently different or 11:27:51
9 different from -- from 1. 11:27:53
10 A. That's correct. 11:27:55
11 Rusert will do -- there are three 11:27:55
12 possible comparisons that Rusert proposes that it 11:27:58
13 could do, and two of those you have mentioned. 11:28:01
14 Q. And -- and the third is essentially an 11:28:03
15 efficiency determination -- that is, the third 11:28:05
16 example comparison in Rusert, as you've 11:28:09
17 interpreted, is an efficiency determination 11:28:12
18 that's along the lines of how similar or whether 11:28:14
19 they're the same; but it's -- it's not quite the 11:28:17
20 same. 11:28:20
21 A. The third -- the third comparison is -- is 11:28:20
22 a determination of -- of -- of which -- of 11:28:23

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1 whether or not it would have been more -- more 11:28:28
2 efficient bit-wise, right? So it's bit-wise -- 11:28:31
3 bit-wise efficiency, so whether it would require 11:28:34
4 fewer bits to send a candidate that's already on 11:28:37
5 the list with an appropriate update to it versus 11:28:40
6 adding this new candidate to the list. 11:28:47
7 Q. Right. 11:28:49
8 And -- and the bit efficiency 11:28:50
9 determination does in some ways relate to the 11:28:52
10 similarity of the -- the two motion vectors being 11:28:55
11 compared because if -- if they're sufficiently 11:28:58
12 similar, then it doesn't cost very much in the 11:29:00
13 bitstream to include some, let's say, residual 11:29:03
14 information about how to correct the resulting 11:29:06
15 motion vector prediction? 11:29:09
16 A. It is based in -- in -- in -- in -- in 11:29:10
17 some way on similarity, but it's much more 11:29:14
18 complex than that because -- because they could 11:29:17
19 be very different, but it would just so happen 11:29:19
20 that the -- that the update that you'd -- the 11:29:23
21 additional update you'd have to send could be 11:29:26
22 very -- much smaller even though they appear to 11:29:29

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1 be very different. 11:29:31
2 Q. Fair enough. 11:29:32
3 That it -- the starting place is how 11:29:33
4 similar is the motion vector that would go on the 11:29:35
5 list in lieu of the new candidate. 11:29:38
6 And then the question is: How many 11:29:43
7 bits is it going to take me to represent that 11:29:44
8 delta? 11:29:48
9 A. Yeah. It's -- it's the -- it's the cost 11:29:48
10 of -- of transmitting the index of the -- the 11:29:50
11 selected motion prediction candidate, which will 11:29:54
12 cost a certain amount, plus the -- as you called 11:29:58
13 it, the delta, the difference between that index 11:30:01
14 and the -- and the -- the actual one. 11:30:03
15 Q. Okay. And -- and so I want to go back to 11:30:06
16 the, sort of, walkthrough of Rusert's Figure 3N 11:30:09
17 that -- that we were doing. 11:30:12
18 And -- and we -- keeping the different 11:30:13
19 forms of the comparisons that you've pointed to 11:30:16
20 in Rusert in mind, we've determined that 1 goes 11:30:18
21 on the list because it's available. 11:30:21
22 Let's say that 2 is sufficiently 11:30:23

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1 different from 1, and it's not easy to represent 11:30:25
2 any delta. Then -- then 2 will also go on the 11:30:28
3 list after some comparison of 1 and 2? 11:30:31
4 A. Again, with -- with respect to this -- 11:30:36
5 this -- this -- this -- this specific example 11:30:41
6 that we're considering where the maximum list 11:30:47
7 size is equal to 5, so far we would have 1 and 2 11:30:51
8 in the subset. 11:30:55
9 Q. All right. Okay. And now in our 11:30:58
10 scenario, we've got 1 and 2 on the PMV cans list, 11:31:01
11 and we're looking at 3 as a candidate. And 11:31:05
12 that's actually the example that your 11:31:09
13 color-coding highlights in -- in Figure 3N below 11:31:11
14 paragraph 130. 11:31:14
15 And now for purposes of this example, 11:31:15
16 let's imagine that 3 is identical to candidate 2 11:31:17
17 in motion vector. 11:31:23
18 A. Okay. 3 is identical. 11:31:24
19 Q. In that scenario, then, 3 would not be 11:31:25
20 added to the PMV -- PMV cans list based on a 11:31:31
21 comparison with 2. 11:31:35
22 A. That -- that's correct. 11:31:39

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1 3 would not be added because it 11:31:39
2 does -- because its motion information duplicates 11:31:42
3 the motion information of 2. 11:31:45
4 Q. And now if we're following the scan order 11:31:47
5 identified in Figure 3N of Rusert, we've 11:31:50
6 determined not to include number 3 on the PMV 11:31:55
7 cans list, and now we're processing candidate 4. 11:31:58
8 A. Okay. Yes. 11:32:02
9 Again, given -- given that we've 11:32:02
10 decided in this particular example to select the 11:32:05
11 maximum number of candidates equal to five, 11:32:09
12 there's still room on the PMV cans list, if you 11:32:12
13 will, then -- within the variable, so we would 11:32:18
14 consider 4 at this point. 11:32:21
15 Q. Okay. And so -- and 4, when it's a 11:32:22
16 candidate, is going to be compared to numbers 1 11:32:27
17 and 2 because 3 wasn't on the list. So we're 11:32:30
18 going to do a comparison of 4 to 2 and 4 to 1? 11:32:34
19 A. Yes. We would -- we would now compare 4 11:32:37
20 and the P -- so the PMV cans variable is now 11:32:41
21 storing information, motion and -- and other 11:32:46
22 information, with respect to 1 and 2. 11:32:49

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1 So we would compare the motion 11:32:51
2 information of 4 with the motion information of 2 11:32:54
3 and 1, as well as, you know, the -- the -- the 11:33:00
4 third comparison we were talking about, which is 11:33:01
5 with respect to coding efficiency. 11:33:04
6 Q. And let's assume that 4 is sufficiently 11:33:06
7 different from 1 and 2, that it -- it passes all 11:33:09
8 those comparisons. 11:33:11
9 And -- and you'd agree with me in that 11:33:12
10 scenario, then, 4 is going to be added to our PMV 11:33:15
11 cans list so that we get 1, 2, and 4? 11:33:19
12 A. The PMV cans variable should now include 11:33:20
13 information related to motion vectors in blocks 11:33:23
14 1, 2, and 4. 11:33:26
15 Q. Okay. Okay. And so now, since our scan 11:33:28
16 limit was five, we're going to look at block 5; 11:33:32
17 and now block 5 is going to be compared to 1, 2, 11:33:34
18 and 4? 11:33:37
19 A. Yeah. Our -- our scan, like -- as you 11:33:39
20 say, our -- our scan limit is five; and at this 11:33:42
21 point, we -- and by the way, the -- the scan 11:33:45
22 limit -- it's -- Rusert does not propose a scan 11:33:48

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1 limit. What Rusert proposes is a maximum PMV 11:33:51
2 list size, right? 11:33:54
3 So at this point, we have 4, 2, and 1, 11:33:56
4 in your hypothetical, in our list; so we will 11:34:00
5 compare -- so we have -- we have three -- three 11:34:04
6 motion vector locations in our list. We will now 11:34:10
7 compare 5 to 4, 2, and 1. 11:34:15
8 Q. Okay. Thank you. 11:34:18
9 And so in this example, when we're 11:34:20
10 processing 5, the 5, under your interpretation of 11:34:24
11 Rusert, could qualify as a first spatial motion 11:34:30
12 vector prediction candidate? 11:34:35
13 A. Absolutely. 11:34:35
14 Q. And the subset in this example would be 1, 11:34:36
15 2, and 4 that you would contend is determined 11:34:39
16 based on 5's location? 11:34:43
17 A. Absolutely. 11:34:44
18 I mean, all we have to do is -- is 11:34:45
19 look at the spatial locations. 2 is directly 11:34:47
20 above 5. 4 is directly above 2. And then 1 is 11:34:51
21 two above and one to the right of 5. 11:34:59
22 Q. All right. And -- and so let's go back to 11:35:05

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1 block 3. 11:35:08
2 And so when we were processing block 11:35:09
3 3, that would also qualify as a -- a first 11:35:12
4 spatial motion vector prediction candidate, you 11:35:14
5 know, at a different point in time in -- in 11:35:16
6 Rusert's scan process? 11:35:18
7 A. At that point in the processing, block 3 11:35:19
8 qualifies as a first spatial motion vector 11:35:21
9 prediction candidate. 11:35:25
10 Q. And then the subset to which block 3 is 11:35:25
11 compared is going to be 1 and 2? 11:35:28
12 A. That is correct. 11:35:32
13 Block 3 -- in terms of Rusert's 11:35:33
14 realization, 1 and 2 information -- the -- the 11:35:36
15 information -- motion vector information 11:35:41
16 regarding -- related to block 1 and 2 will be in 11:35:44
17 the PMV cans list. 11:35:47
18 And that will constitute the subset to 11:35:49
19 which block 3, which would be the first spatial 11:35:52
20 motion vector prediction candidate, is compared 11:35:56
21 to. 11:35:56
22 Q. And then for block 4, in the scenario 11:35:57

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1 where block 3 is not added to the list -- you 11:36:02
2 know, it's sufficiently similar or it's not 11:36:05
3 available, what have you, then block 4 is 11:36:06
4 compared to 1 and 2? 11:36:10
5 A. So block 4 in this case is now our first 11:36:14
6 spatial motion vector prediction candidate. PMV 11:36:17
7 cans contains our -- our dynamic random variable 11:36:20
8 that we're using to track the subset, contains, 11:36:25
9 as its subset, motion information report -- 11:36:27
10 motion information related to blocks 1 and 2. 11:36:31
11 And, of course, we see that relative 11:36:34
12 to the first motion vector prediction candidate, 11:36:36
13 block 4, block 1 is spatially located one to the 11:36:40
14 right and block 2 is located one below. 11:36:44
15 Q. I think you used the phrase "dynamic 11:36:53
16 random variable." 11:36:57
17 Can you explain what that term means 11:36:58
18 as a technical matter? 11:37:01
19 A. It just means that it's -- it's changing, 11:37:02
20 so it's -- it's being updated. Each time we go 11:37:04
21 through this process, we are updating the 11:37:07
22 contents of this. 11:37:10

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1 So -- so the -- the subset is being 11:37:11
2 stored in this dynamic random variable as we go 11:37:13
3 through this process; and when the process is 11:37:18
4 complete, the results that -- what's held in PMV 11:37:20
5 cans is going to be the list of prediction 11:37:23
6 candidates. 11:37:27
7 Q. Okay. Thanks. 11:37:27
8 MR. VERBONCOEUR: I'd like to 11:37:28
9 introduce another exhibit here. I think we're up 11:37:30
10 to Exhibit 6. 11:37:30
11 THE COURT REPORTER: Yes, we are. 11:37:30
12 Mr. VERBONCOEUR: Thank you. 11:37:31
13 (Whereupon Exhibit Number 6 was 11:37:31
14 marked for identification.) 11:37:32
15 (Discussion off the record.) 11:38:05
16 Q. (BY MR. VERBONCOEUR) So, Doctor, what's 11:38:05
17 been marked as Exhibit 6 is a presentation 11:38:06
18 associated with someone named Hiroya Nakamura. 11:38:10
19 Do you have Exhibit 6 in front of you? 11:38:14
20 A. I do. 11:38:16
21 Q. And do you recognize this document? 11:38:17
22 A. Yes, I do recognize it. 11:38:21

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1 Q. What is Exhibit 6? 11:38:22
2 A. Exhibit 6 is one part of a -- what you 11:38:24
3 could call a compound reference, the way we've -- 11:38:28
4 the way we've referred to it, with respect to a 11:38:31
5 proposal by Nakamura for the H.265 standard. 11:38:36
6 So there are two other parts to this, 11:38:42
7 as well, but this is -- this presentation is one 11:38:45
8 part of that. 11:38:46
9 Q. Okay. And -- and if you look at the first 11:38:47
10 page of Exhibit 6, there's something that says 11:38:49
11 "JCTVC-F419." 11:38:53
12 A. Yes, I see that. 11:38:59
13 Q. And do you agree that "JCTVC" is referring 11:38:59
14 to the team of video engineers that were working 11:39:04
15 on the -- the draft H.265 standard? 11:39:06
16 A. It is -- it is definitely -- it is the 11:39:09
17 committee that was -- that was developing the 11:39:12
18 H.265 standard. I don't know that "team of video 11:39:14
19 engineers" is necessarily -- but it was the 11:39:18
20 committee that did that. 11:39:20
21 Q. Would you at least agree the "T" in this 11:39:21
22 acronym stands for "team"? 11:39:25

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1 A. Oh, absolutely. 11:39:26
2 Q. Okay. 11:39:26
3 A. But I -- it's the "video engineers" 11:39:27
4 part -- 11:39:28
5 Q. Okay. 11:39:28
6 A. -- that I have a problem with. 11:39:29
7 Q. But it -- it's a team of -- of 11:39:30
8 knowledgeable individuals who were working on 11:39:30
9 developing the H.265 standard? 11:39:33
10 A. That is a better characterization. 11:39:35
11 Q. Okay. Yeah. Maybe there's some ambiguity 11:39:36
12 as to what a video engineer is. 11:39:40
13 A. I'm thinking of somebody who runs the TV 11:39:41
14 station or something. 11:39:44
15 Q. Yeah. Okay. 11:39:45
16 And -- and are -- are you familiar, 11:39:46
17 Doctor, that -- that Nokia also submitted a merge 11:39:48
18 mode contribution associated with the H.265 11:39:53
19 standard? 11:39:56
20 A. No, I -- I'm actually not. I -- I'm not 11:39:57
21 familiar with Nokia's contribution, and I haven't 11:39:59
22 reviewed that. 11:40:03

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1 Q. Okay. I -- I'd like to look at Page 7 of 11:40:04
2 Exhibit 6, of the Nakamura presentation. 11:40:07
3 A. Okay. 11:40:15
4 Q. And if you -- if you need to see the other 11:40:15
5 Nakamura -- the documents that Nakamura provided, 11:40:20
6 the standard, let me know; but maybe we can 11:40:23
7 simplify this. 11:40:27
8 Would you agree that the diagram shown 11:40:28
9 here on Page 7 of Exhibit 6 is consistent with 11:40:30
10 Nakamura's contribution or proposal to the 11:40:33
11 standard as far as the -- the check order and the 11:40:36
12 candidates, et cetera? 11:40:39
13 A. I would say that this -- this diagram, 11:40:42
14 while not -- while it certainly does not describe 11:40:46
15 all of Nakamura's proposed contribution, does 11:40:49
16 show -- it shows the -- the order in which you 11:40:54
17 check neighboring motion -- neighboring blocks 11:40:57
18 for their motion vectors. 11:41:03
19 And it -- it does illustrate the -- it 11:41:05
20 shows -- it shows what the name -- the -- it also 11:41:10
21 shows the locations of those neighboring blocks 11:41:12
22 relative to the current block, and it also 11:41:14

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1 indicates this S -- first candidate, S0, second 11:41:18
2 candidate, S1, though it -- it doesn't really -- 11:41:23
3 we -- just by looking at this, I don't think you 11:41:27
4 would -- you would glean exactly what S0 and S1 11:41:30
5 actually mean. 11:41:34
6 Q. That's fair. 11:41:39
7 And if you look at Page 9 of 11:41:39
8 Exhibit 6, there's a -- a table comparing HM3.0 11:41:42
9 and proposed technique for merge mode. 11:41:49
10 A. I am looking at the table. 11:41:51
11 Q. Do you know what HM3.0 refers to on Page 9 11:41:53
12 of Exhibit 6? 11:41:59
13 A. Yeah. It was one of the -- it was -- it 11:41:59
14 was -- at the time Nakamura made this proposal, 11:42:02
15 it was the current test model for the -- for the 11:42:05
16 standard that was being developed that ultimately 11:42:14
17 became H.265/HEVC. 11:42:16
18 Q. Okay. And on Page 9 of Exhibit 6, the 11:42:21
19 Nakamura presentation, can you tell me what you 11:42:25
20 identified as the set of spatial motion vector 11:42:30
21 prediction candidates for an encoded block of 11:42:36
22 pixels corresponding to the '714 patent's claims? 11:42:38

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1 A. Well, it -- the -- you're saying can I 11:42:42
2 identify it on Page 9? 11:42:46
3 Q. Or -- or anywhere in -- in Exhibit 6. 11:42:47
4 A. The -- the set of spacial -- the set of 11:42:53
5 spatial motion vector prediction candidates 11:42:57
6 with -- with respect to -- to, you know, the '714 11:42:59
7 patent, would be, in my opinion, A, B, C, D, and 11:43:05
8 E. 11:43:11
9 Q. Okay. And if we go back to Page 7, so 11:43:12
10 that we have a reference, of Exhibit 6, the 11:43:22
11 Nakamura presentation, what you identify as the 11:43:24
12 candidates A, B, C, D, and E are -- are checked 11:43:27
13 in order, in -- in alphabetic order? 11:43:31
14 A. In the case of merge mode, that's -- 11:43:38
15 that's clearly the case, A, B, C, D, E. 11:43:40
16 Q. And the reason you believe Nakamura meets 11:43:42
17 the limitation, without making a comparison of 11:43:52
18 each possible candidate pair from the set of 11:43:55
19 spatial motion vector prediction candidates, is 11:43:59
20 that if S1 and S1 are compared to one another, 11:43:59
21 that's -- that's not a -- a comparison of all 11:44:04
22 possible permutations of -- of the five 11:44:06

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1 candidates you've identified? 11:44:08
2 A. That's correct. 11:44:10
3 All -- all that Nakamura's doing 11:44:11
4 is it's simply looking to see if there's any 11:44:16
5 spatial motion vector prediction information 11:44:21
6 available, and it simply -- if there is, the 11:44:24
7 first one where there's something available, it 11:44:27
8 puts it into -- into S0; second one where 11:44:30
9 something's available, it puts it into S1; and 11:44:34
10 then the comparisons it does are relative to S1, 11:44:37
11 S0, and the temporal -- and a temporal motion 11:44:41
12 vector prediction candidate. 11:44:46
13 Q. All right. And -- and, I mean, looking at 11:44:46
14 Nakamura on -- on Page 7 of Exhibit 6, one reason 11:45:17
15 that's shown here in Nakamura's example that a 11:45:23
16 candidate might not be available as a spatial 11:45:27
17 motion vector prediction candidate is -- is 11:45:30
18 that -- if it's associated with an "intra" block? 11:45:30
19 A. That's correct. 11:45:35
20 Q. And then another example given where -- in 11:45:36
21 Nakamura's example on Page 7 of Exhibit 6 a 11:45:41
22 candidate's not available is if it's just not 11:45:46

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1 present, and that's -- that's shown with the 11:45:48
2 example of the block labeled "C"? 11:45:51
3 A. I believe that would be the case where 11:45:53
4 possibly it has not been processed yet, so they 11:45:55
5 don't have any motion information available. 11:45:57
6 Q. And do you agree that it would also be 11:45:59
7 a -- a possible scenario shown on Page 7 of 11:46:02
8 Exhibit 6 where if, for example, the -- the 11:46:06
9 current block shown on that page was at the very 11:46:07
10 right side of the frame so that the -- the block 11:46:10
11 labeled "C" is just not present? 11:46:13
12 A. That could be the case that -- that 11:46:17
13 they're talking about here, right? 11:46:20
14 This could -- that could -- it could 11:46:21
15 be all the way to the right side of the frame; 11:46:22
16 and that could be why C is not present, not 11:46:25
17 available. 11:46:27
18 Q. Right. 11:46:27
19 And -- and likewise, you would have a 11:46:28
20 situation where A, D, and E are -- are not 11:46:29
21 available if the current block was all the way to 11:46:32
22 the left side of the frame? 11:46:36

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1 A. Certainly. 11:46:36
2 If it were in the upper -- upper 11:46:37
3 left-hand corner, then A, D, E, and B would not 11:46:39
4 be available. 11:46:42
5 Q. And -- 11:46:42
6 A. And C. None of them would be available. 11:46:44
7 Q. I -- I apologize for talking over you. 11:46:46
8 A. So... 11:46:49
9 Q. I mean -- and -- and -- and I think a 11:46:50
10 person of skill in the art would understand 11:46:53
11 that -- that frames are of finite sizes; and so 11:46:54
12 if -- if your current block is on the far edge 11:46:57
13 at, you know, either left or right of the frame, 11:46:59
14 you're going to have some neighbors that just 11:47:01
15 aren't present? 11:47:04
16 A. A person of ordinary -- a person of 11:47:05
17 ordinary skill in the art would certainly 11:47:07
18 understand that; but, of course, they would also 11:47:08
19 understand there could be other reasons why a 11:47:11
20 block isn't available, depending upon the scan 11:47:13
21 order. 11:47:17
22 Q. Yeah. 11:47:17

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1 It -- it could be that it's an "intra" 11:47:18
2 block, it could be it's not processed yet, or it 11:47:24
3 could be that --
4 THE COURT REPORTER: It could be
5 the what block?
6 MR. VERBONCOEUR: Intra,
7 I-N-T-R-A, block.
8 Q. (BY MR. VERBONCOEUR) It could be that
9 it's not -- there's no motion vector associated 11:47:28
10 with it or -- or you're on one end of the frame 11:47:30
11 or the other? 11:47:33
12 A. Yes. 11:47:33
13 There are -- there are a number of 11:47:34
14 reasons why a block could not be available, and a 11:47:35
15 person of ordinary skill in the art would 11:47:38
16 certainly understand that. 11:47:41
17 Q. And, you know, as -- as it relates to -- 11:47:42
18 to Rusert, I mean, the same availability query is 11:47:45
19 true in Rusert's process; that is, if you're at 11:47:49
20 the far end of the frame, some numbers in the 11:47:52
21 scan order aren't going to be available? 11:47:55
22 A. You -- you can only use -- for -- for 11:47:59

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1 spatial prediction, right; so we're talking about 11:48:03
2 using spatial motion prediction. In other words, 11:48:05
3 we're only -- talking about only using 11:48:09
4 information from within the current frame. 11:48:10
5 You can only use, for prediction, 11:48:12
6 previously -- motion vectors corresponding to 11:48:15
7 previous blocks. 11:48:19
8 So if there are no previous blocks, in 11:48:19
9 an extreme case, if you're in the upper left-hand 11:48:22
10 corner, there are no previously-encoded blocks, 11:48:25
11 you simply -- you -- you have nothing to use for 11:48:28
12 a spatial motion vector prediction from that 11:48:30
13 frame. So there's simply nothing you can do 11:48:33
14 about that. 11:48:36
15 Q. Right. 11:48:36
16 That's -- I mean, yeah. I think -- I 11:48:37
17 think -- I think you've covered it. That's -- 11:48:38
18 that's -- that's just a facet of video coding 11:48:39
19 that's true of both Rusert and Nakamura? 11:48:41
20 A. Yeah. 11:48:44
21 MR. VERBONCOEUR: Okay. I -- I 11:48:48
22 may be able to wrap up, so I'd like to take a -- 11:48:49

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1 a quick break and just make sure I've got no 11:48:52
2 further questions. 11:48:55
3 MR. LIANG: Okay. 11:48:56
4 (Break taken from 11:48 a.m. to 11:48:58
5 11:54 a.m.) 11:54:24
6 MR. VERBONCOEUR: All right. No 11:54:27
7 further questions. 11:54:27
8 Thank you for your time, Doctor. 11:54:28
9 THE WITNESS: Thank you. 11:54:29
10 MR. LIANG: Nothing further from 11:54:35
11 me. Nothing from me. 11:54:36
12 THE COURT REPORTER: Okay. All 11:54:40
13 righty. Anything else for the record? 11:54:41
14 MR. LIANG: Not from me. 11:54:43
15 MR. VERBONCOEUR: No. 11:54:44
16 (Deposition concluded.)
17 * * * * *
18
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22

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1 I, CHARLES D. CREUSERE, have read the
foregoing deposition and hereby affix my
2 signature that same is true and correct, except
as noted above.
3
4
_____
5 CHARLES D. CREUSERE
6
7 THE STATE OF _____)
COUNTY OF _____)
8
Before me, _____, on
9 this day personally appeared CHARLES D. CREUSERE,
known to me (or proved to me under oath or
10 through _____) (description
of identity card or other document) to be the
11 person whose name is subscribed to the foregoing
instrument and acknowledged to me that they
12 executed the same for the purposes and
consideration therein expressed.
13 Given under my hand and seal of office this
_____ day of _____,
14 _____.
15
_____
16 NOTARY PUBLIC IN AND FOR
THE STATE OF _____
17 COMMISSION EXPIRES: _____
18
19
20
21
22

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1 UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD
2
AMAZON.COM, INC.,)
3 AMAZON.COM SERVICES)
LLC,) CASE NO.:
4) IPR2024-00604
Petitioner,)
5) U.S. Patent No.
VS.) 10,536,714
6)
NOKIA TECHNOLOGIES OY,)
7)
Patent Owner.)
8
UNITED STATES PATENT AND TRADEMARK OFFICE
9 BEFORE THE PATENT TRIAL AND APPEAL BOARD

10 AMAZON.COM, INC.,)
AMAZON.COM SERVICES)
11 LLC,)
) CASE NO.:
12 Petitioner,) IPR2024-00605
)
13 VS.) U.S. Patent No.
) 10,536,714
14 NOKIA TECHNOLOGIES OY,)
)
15 Patent Owner.)

16
REPORTER'S CERTIFICATION
17 DEPOSITION OF CHARLES D. CREUSERE
JANUARY 20, 2025
18

19 I, Annette Peltier, Certified Shorthand

20 Reporter in and for the State of Texas, hereby

21 certify to the following:

22 That the witness, CHARLES D. CREUSERE, was

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1 duly sworn by the officer and that the transcript
2 of the oral deposition is a true record of the
3 testimony given by the witness;
4 That the original deposition was delivered to
5 Mr. Mitch Verboncoeur, Custodial Attorney.
6 I further certify that the signature of the
7 deponent:
8 ____ was requested by the deponent or a party
9 before the completion of the deposition and that
10 signature is to be returned within 30 days from
11 the date of receipt of the transcript. If
12 returned, the attached changes and signature page
13 contains any changes and the reasons therefore.
14 XXX was not requested by the deponent or
15 party before the completion of the deposition.
16 I further certify that I am neither counsel
17 for, related to, nor employed by any of the
18 parties or attorneys in the action in which this
19 testimony was taken. Further, I am not a
20 relative or employee of any attorney of record in
21 this cause, nor am I financially or otherwise
22 interested in the outcome of the action.

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1 Certified to by me this 26th day of January,
2 2025.
3
4 _____
Annette Peltier, Texas CSR 3253
5 Expiration Date: 10/31/25
Firm Registration No. 686
6 451 Hungerford Drive
Suite 400
7 Rockville, MD 20850
Phone: 888.433.3767
8 Fax: 888.503.3767
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