

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

3
4 AMAZON.COM, INC., AMAZON.COM SERVICES LLC,
5 Petitioners,

6
7 v.

8
9 NOKIA TECHNOLOGIES OY
10 Patent Owner.

11
12 Case IPR2024-00691
13 U.S. Patent No. 8,050,321
14

15
16 REMOTE DEPOSITION of JOSEPH P. HAVLICEK, Ph.D.,
17 Tuesday, December 3, 2024
18 11:02 a.m. CST
19

20 Job No.: 563044

21 Pages: 1 - 109

22 Reported By: Michelle M. Yohler, CSR, RMR, CRR

1 The deposition of JOSEPH P. HAVLICEK, Ph.D.,
2 held remotely pursuant to notice before
3 Michelle M. Yohler, CSR, RMR, CRR, a certified
4 shorthand reporter, CSR No. 84-4531.

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A P P E A R A N C E S

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(Continued)

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9 ALSO PRESENT:

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E X A M I N A T I O N S

WITNESS	PAGE
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E X H I B I T S

EXHIBITS	PAGE
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1 P R O C E E D I N G S

2 (Technician read-on.)

3 (WHEREUPON, the witness was duly sworn.)

4 DR. JOSEPH P. HAVLICEK,
5 called as a witness herein, having been first duly
6 sworn, was examined and testified as follows:

7 EXAMINATION

8 BY MR. UDICK:

9 Q Dr. Havlicek, good morning. How are you?

10 A Hanging in there. Thank you very much.

11 Pleased to meet you.

12 Q Yeah, pleased to meet you as well. It's
13 too bad -- I think this was originally scheduled
14 for Norman, and I was up there this weekend for my
15 in-laws. I was thinking maybe we could meet in
16 person, but then you ended up on the coast,
17 escaping the cold.

18 A Yeah, mostly trying to not misappropriate
19 any State funds.

20 Q I hear that.

21 Well, thank you for your time today. As
22 you know, you submitted a declaration in a

1 petition in regards to U.S. Patent 8,050,321. Is
2 it all right if we refer to that as "the '321
3 patent" today?

4 A Yes, sir.

5 Q Okay. And I take it from your CV that
6 you've -- this isn't your first deposition,
7 correct?

8 A That's correct.

9 Q Would you ballpark upwards more than
10 20-ish or so?

11 A You know, that's what I thought, and then
12 I counted them last night, and it's really more
13 like ten.

14 Q Okay. I think you heard some of the rules
15 from -- or some of the guidelines from the
16 technician. I'll kind of restate some of them,
17 especially in this Zoom world.

18 I understand that the audio generally only
19 transmits one mic at a time, so if we step over
20 each other, sometimes that isn't recorded. So we
21 just have to be particularly careful to let each
22 other finish either the state- -- the question or

1 the response before turning to the next one. And
2 that will also give your counsel time to object.

3 Is that fair?

4 A Understood and agreed.

5 Q And then obviously if your counsel
6 objects, you still have to answer the question
7 unless it's related to privilege.

8 Is that your understanding?

9 A Yes, sir, I do so understand.

10 Q And, undoubtedly, I'm going to mess up a
11 question. You're going to hear it, and you're
12 going to go: What in the world did he just try to
13 ask?

14 If I do that, will you just let me know
15 that you didn't understand the question so I can
16 rephrase it for you?

17 A I will do so, yes. No problem.

18 Q Great.

19 And if you don't ask for -- if you don't
20 state that you misunderstood the question, is it
21 okay if I understand that you thus understood my
22 question?

1 A Yes. And should I later realize that I
2 didn't, I will let you know, you know, when I
3 figure it out.

4 Q Perfect.

5 In front of you or on your computer, do
6 you have a copy of your declaration or any
7 materials?

8 A So here's what I have: I'm Zooming to you
9 on one laptop, and then right beside me, right
10 here (indicating), I have another one that was
11 prepared by Perkins Coie that has nothing on it
12 but clean copies of the exhibits from my
13 declaration, including the declaration itself --

14 Q Okay.

15 A -- all perfectly clean.

16 Q And I think that will be coming to you, so
17 I think sometimes we'll -- as you've probably seen
18 before, we might be referring to an exhibit that
19 you cite in your declaration, and it's useful to
20 have your declaration up and the exhibit up. And
21 perhaps we can do that through this chat window as
22 well when I drop an exhibit in.

1 Does that work for you?

2 A Yes, sir. And assuming that downloading
3 works, I will also be able to display them on the
4 computer, which is running Zoom currently.

5 Q Great. So it sounds like there is maybe
6 no time but the present to test whether or not you
7 can download from the exhibit.

8 I'm adding to chat Exhibit 1001 from the
9 IPR, which is the '321 patent. Let me know if
10 you're able to access that and scroll through it.

11 (WHEREUPON, Exhibit No. 1001 was presented
12 to the witness.)

13 BY THE WITNESS:

14 A It says it put it somewhere. I just have
15 to figure out where it put it. I'm going to check
16 tilde slash downloads and see what we get.

17 I've got it. Somehow I have to
18 double/triple click.

19 Now it is open, and it appears to be a
20 Hannuksela '321.

21 Q Great.

22 And if we would turn to -- so, normally,

1 we'll take the common approach and refer to column
2 and line by the patent; is that okay with you?

3 A Yes, sir.

4 Q But, in this instance, I'm just going to
5 point you to the claims, and particularly claim 8
6 to begin with, which I believe is column 7.

7 A Yeah, claim numbers are fine with me. And
8 I'm scrolling down there right now.

9 Q It's not column 7, but it is claim 8.

10 A No problem. I am at claim 8.

11 Q And just so we are kind of talking on the
12 same pages, because I think some of the petition
13 and the patent owner preliminary response and
14 others, kind of, labeled the limitations
15 differently, so I just want to agree to, kind of,
16 a common approach. I think it's the one that you
17 took in your declaration.

18 Can we agree that -- so you understand
19 what the preamble is; for example, claim 8?

20 A I do.

21 Q And so we'll talk about preamble as the
22 preamble instead of the "a limitation"; is that

1 fair?

2 A Fair enough. And I'll endeavor to
3 understand and be with you.

4 Q Great.

5 And then in claim 8, for example, the
6 limitation that starts with "decoding from the
7 video sequence" we'll call that limitation A.

8 And then the "starting the decoding"
9 limitation is B.

10 And then the "decoding identifier values"
11 limitation is C.

12 And, finally, the "resetting the
13 identifier value" is D.

14 Is that all fair?

15 A That is fair. Let me, however, list a
16 caveat that I may not be able to remember that,
17 and if you just --

18 Q Sure.

19 A So, you know, to me, they're the
20 resetting, the decoding, the starting the
21 decoding, and so on. I'll try to keep up with
22 you.

1 Q That's fair. And I'll probably end up
2 saying the same, the decoding, you know, from the
3 video sequence or maybe the indication limitation,
4 then the starting the decoding limitation, and so
5 forth and so on, but I think we're on the same
6 page.

7 A Perfect.

8 Q And what did you do to prepare for today's
9 deposition?

10 A To prepare for today's deposition, I
11 reviewed the materials listed in the table at the
12 front of the deposition. I will say that the
13 complaints I haven't really looked at since, you
14 know, a year ago almost, but the rest of them, I
15 reviewed those.

16 And then I met with counsel for -- we had
17 a meeting that was a Zoom meeting. I met with
18 counsel here yesterday. That was my preparation.

19 Q Great.

20 And for about how long did you meet?

21 A I am going to guess that the total between
22 the Zoom meeting we had about a week ago and

1 yesterday, we're looking at about 14 hours.

2 Q And when was the Zoom meeting that you
3 had --

4 A About one week ago.

5 Q And whom was on that -- or who was on that
6 Zoom meeting?

7 A Tyler Kendrick and for a time, Robin
8 Brewer, and for a time, part of it, Jessica
9 Kaiser.

10 Q Okay. And what about at your in-person
11 meeting yesterday?

12 A At my in-person meeting yesterday, Tyler
13 Kendrick was present, Robin Brewer was present,
14 and Jessica Kaiser was present by Zoom for a
15 portion.

16 Q Great.

17 And do you understand that this patent was
18 also involved in some ITC litigation?

19 A I was aware of that, yes.

20 Q In preparing for your deposition, did you
21 review any information from that ITC proceeding?

22 A I did not. I have been sort of siloed

1 from that.

2 Q So if you would -- so, for the record,
3 I'll call out your declaration, which is
4 Exhibit 1003 of the petition. And if you'd like
5 to open that up on your device, that would be
6 great, just to make sure we're there.

7 A Yes, sir, I have it open. And I would
8 like to make you aware that I have a piece of
9 paper in front of me on which I have written three
10 errata for that declaration, and I would be happy
11 to share them with you and even give you this
12 piece of paper, if you would like.

13 Q Sure. Let's -- how long is the errata?

14 A Pretty short.

15 Q Okay.

16 A Three items.

17 Q All right. Inside each item -- right? --
18 it could be -- you never know; the lawyer in me
19 says three items, but is each item three-quarters
20 of a page?

21 A Two of them just reference page numbers
22 changed. The third one is, like, somehow an edit

1 got washed out of the final Word version. I don't
2 know how that happened, but a sentence was
3 omitted.

4 Q Sure. So let's -- why don't we talk
5 through those three.

6 A Yes, sir.

7 The first one occurs at Paragraph 67,
8 which is found on Page PDF -- PDF Page, sorry, 31.

9 Q Right. Okay.

10 A And as soon as I get there, I'll tell you
11 the corrections. It's very simple. There's a
12 reference there in Line 4 that says Exhibit 1005
13 at Page 70.

14 Q I see that.

15 A But it should be 71. It's Page 71.

16 Q And Exhibit 1005, just for the record,
17 that is what is cited as -- or kind of is referred
18 to throughout your declaration and the petition as
19 MPEG-1; is that correct?

20 A Yes, sir, absolutely correct.

21 Q And then another housekeeping, 71, that
22 refers to the page number that petitioner has

1 marked that document as; is that correct?

2 A Correct. And thank you for clarifying.

3 Q Okay. And on to the second errata.

4 A The second one occurs in Paragraph 106,
5 which is found on PDF Page 46.

6 Q Okay. And that's Paragraph 106 you said?

7 A Correct.

8 Q Great.

9 A There's a reference there again to
10 Exhibit 1005 of the declaration, which is the
11 MPEG-1 standard, and it says Page 119, but it
12 actually should be Page 103.

13 Q Okay. And the final errata?

14 A Is the slightly more complicated one.

15 Q Sure.

16 A And this is found on Paragraph 129.

17 Q Okay.

18 A It's the last sentence.

19 Q So following, "A POSITA would have
20 understood that this microcode" with a
21 quotation -- a decent-sized quote followed by
22 another quote?

1 A Correct.

2 Q Okay.

3 A And so here's the deal: The DRAM is not
4 non-transitory memory. The -- and this is exactly
5 what is in the cited reference at Page 3. The
6 host processor loads the code from the
7 non-transitory memory into the DRAM so that the
8 device can execute it.

9 And so this paragraph was just muffed, and
10 there was an edit here that, you know, had this
11 corrected, and it got lost somewhere, and I
12 apologize for that.

13 Q And was there a specific wording that was
14 lost, or was it just the understanding that you
15 just cited -- or that you just explained a moment
16 ago?

17 A Just another sentence quoting from that
18 reference 1007 at Page 3, that the host processor
19 loads the code into the DRAM. The DRAM is not --
20 that sentence that says the DRAM is a
21 non-transitory memory should have been struck. It
22 was struck, but it came back to life somehow.

1 Q Understood.

2 A And that's my errata list.

3 Q Okay. Not too bad.

4 Okay. So we do have your declaration up.

5 And just so we're talking about the same things,

6 there are two -- you have three grounds in your

7 declaration; is that correct?

8 A Correct.

9 Q Ground 1 is, MPEG-1 renders obvious

10 claims 8, 10, and 11, right?

11 A Correct.

12 Q And then the second one is Kim renders

13 obvious claims 8, 10, and 11 as well, correct?

14 A Also correct.

15 Q And then ground 3 is MPEG-1 and Yagasaki

16 render obvious claim 9, right?

17 A That is it, yes.

18 Q If we would, let me drop into chat

19 Exhibit 1006, which is U.S. Patent 6,912,351,

20 otherwise known as Kim.

21 (WHEREUPON, Exhibit No. 1006 was presented

22 to the witness.)

1 BY MR. UDICK:

2 Q And do you understand that the 6,912,351
3 patent, are you okay with us referring to that as
4 "the Kim reference"?

5 A Yes. In fact, I prefer that, to be honest
6 with you.

7 Q Same.

8 And, Dr. Havlicek, let me know when you're
9 able to open up 1006.

10 A I do have it open at this time.

11 Q Great. And the beginning of your opinions
12 with regard to Kim begin on, I believe, Page --
13 and I have it printed, but it's Paragraph 139 or
14 the paginated Page 57.

15 A I currently have my declaration open on
16 the Perkins-supplied computer at Paragraph 139,
17 and I have Kim open on the Zoom computer.

18 Q Great.

19 So I want to ask a couple questions about
20 the Kim reference. So, specifically, if we turn
21 to a bit further in your declaration, turn to
22 Paragraph 179.

1 A I am now at Paragraph 179.

2 Q Great.

3 So there your sentence says, "Kim
4 discloses encoding image frames in accordance with
5 MPEG" and then it cites to Exhibit 1006, or Kim,
6 at 4:15-19, and then goes on, "And subsequently
7 decoding those image frames."

8 Do you see that sentence?

9 A I do see it, yes.

10 Q And then carrying on in that paragraph, it
11 goes on to say, "Kim thus discloses decoding video
12 that conforms to the MPEG standard."

13 Do you see that?

14 A Yes, sir, it's on the top of the next
15 page.

16 Q Right. And now if we go to Kim at the
17 cited 4:15 to 19.

18 A I'm there. I haven't read it yet. Would
19 you like me to read it now?

20 Q Sure. If you would, take a look at that.

21 A Okay. I'll just read it out loud, "In
22 Step S10, if the value of the moving vector is

1 less than the reference value (i.e., little change
2 between two frames), the restored frame data
3 (second image data) is output to the encoder 110
4 as a frame that has much less data than the
5 I-picture frame, e.g., as a P-picture frame in
6 MPEG."

7 Is that -- that's how far you wanted me to
8 go?

9 Q Yes. That is the sentence that you cited;
10 is that correct?

11 A Yes, sir.

12 Q So is it your understanding from that
13 sentence that Kim encodes frames according -- in
14 accordance with MPEG?

15 A That's an excellent question. Yes, in the
16 spirit of MPEG, let's put it that way.

17 I would say that, you know, this implies
18 that all embodiments of Kim would have P-pictures
19 and I-pictures that basically function the same as
20 those correspondingly named entities in MPEG-1.

21 Now, there's going to be some minor
22 differences in Kim's implementations, you know,

1 because of the nature of his optical disk and his
2 recording process and so on, but the concept of
3 the I-frame and P-frame are the same as they are
4 in MPEG.

5 The -- every last detail of the
6 encoding/decoding, particularly with regards to
7 header information, is not necessarily implied to
8 be exactly the same by Kim.

9 Q One other difference between Kim and MPEG
10 is that every P-picture in Kim has to refer back
11 to an I-picture, versus in MPEG-1, where a
12 P-picture can refer back to a previous P-picture;
13 is that correct?

14 A Yes. You know, MPEG is clear that a
15 P-picture will take as its reference the most
16 recent in encoding -- or in decoding order, excuse
17 me, what is often called an anchor frame, which
18 would be a P or an I. So you're correct.

19 And in Kim, all of those P-frames in the
20 group, all of them, refer back to the I.

21 Q Right. And some of the language changes,
22 some of the patents refer to a P-picture while

1 others talk to maybe a P-frame. Is it your
2 understanding that these are essentially
3 interchangeable, at least with respect to how
4 we're talking about them in this petition?

5 A Yes, sir, I agree with that. I would call
6 them synonyms.

7 Q Great.

8 And turning to -- if we go to paragraph, I
9 think, 143 of your declaration, which is on --
10 when I'm referring to pages, it's the printed
11 page. It starts at 59, goes through 60.

12 A I am at Paragraph 143.

13 Q Okay. In the second sentence, it says,
14 "When the request corresponds to an I-picture" --
15 and this is referring to Figure 4, "When the
16 request corresponds to an I-picture, the picture
17 is decoded and output as an image signal."

18 Do you see that?

19 A I do see that.

20 Q And the -- you have a citation
21 parenthetical with also an annotation that says
22 "'No' path annotated in red," right?

1 A Yes, sir.

2 Q Can you show me or explain to me where in
3 Figure 4 the I-picture data is decoded?

4 MR. KENDRICK: Object to the form.

5 (Reporter clarification.)

6 BY THE WITNESS:

7 A So I just scrolled down to the version of
8 Figure 4, the annotated version that appears on
9 the next page in the declaration, and I'll talk to
10 that.

11 And so it is my opinion that the decoding
12 of the I-picture actually begins in the diamond
13 labeled S23. And that's not a full decoding, but
14 it's how Kim recognizes that the invention has
15 reached a picture that was requested by the user,
16 which in this case is an I-picture.

17 And then the execution flow goes down
18 through the "Yes" path there, and it hits the next
19 decision diamond, S32, which is annotated in
20 yellow in this annotated version of Figure 4. And
21 that is where there is further decoding performed,
22 which determines that this is not a P-picture.

1 And so that will send the execution down
2 the red path emanating from the left side of the
3 diamond S32. And this red annotated path then,
4 you know, goes right to the end to S39. And this
5 is where the decoding of the inverse quantitation
6 and inverse transform have to occur.

7 Q So you say the decoding of the inverse
8 quantitation and inverse transforms occur at S39?

9 A I think I need to take that back. I'm
10 sorry. They occur at S30.

11 Q Okay.

12 A So since I said that incorrectly, let me
13 just rephrase for clarity that the decoding of
14 this I-picture sort of doesn't occur all at once.
15 There is some elements of the I-picture data or
16 the data associated with the I-picture that occurs
17 in the decision diamond S23.

18 There is, you know, a significant amount
19 of computation that occurs in, as Kim calls it,
20 restoring the original data in S30, and that
21 includes the box that does the reverse
22 quantization and reverse transform, which I

1 believe is labeled "decoder" in Figure 3.

2 Q Got it.

3 And where in your opinion does the
4 decoding start for a P-picture in Figure 4?

5 A Well, some element of the data associated
6 with the P-picture, under the assumption that a
7 P-picture was requested, then some elements of
8 that data associated with the P-picture will be
9 decoded again in the diamond S23.

10 And then in S30, again, just like the
11 I-picture, there will perform -- the device will
12 perform the inverse quantization and inverse
13 transform.

14 But unlike the I-picture, this performance
15 of the -- what's called the Q minus 1 and the
16 T minus 1 does not produce the decoded image;
17 rather, it produces the motion compensation
18 residuals.

19 Then, subsequent to that, Kim has to
20 remember the current position of this P-picture
21 that's been partially decoded. That occurs at
22 S33. Kim then has to retrieve the I-frame,

1 I-picture, however you want to call it, and decode
2 that in its entirety.

3 The decoded I-frame is then stored and
4 used as the reference blocks to complete the
5 decoding of the full P-picture, which is S38.

6 Q So in both the I and the P-picture, the
7 decoding starts at S23, and in some -- and for the
8 P-picture has a few more steps, but both end at
9 S39; is that correct?

10 MR. KENDRICK: Object to the form.

11 BY THE WITNESS:

12 A I think essentially correct, yes. Maybe
13 I'll restate it, and we'll see if we agree.

14 Whether the user requests an I-picture or
15 a P-picture, the decoding process will end at S39
16 in either one of those two cases.

17 BY MR. UDICK:

18 Q And where will that decoding process start
19 in either of those two cases?

20 A As you said correctly, in the diamond S23.

21 Q So if we look at -- probably easier to
22 look at your declaration for some of the claim

1 limitations and going back to the patent and then
2 to the declaration.

3 So over one more page on -- for
4 limitation 8[a], the "decoding from the video
5 sequence an indication"; do you see that?

6 It's Page 61 just above Paragraph 146.

7 A Yes, sir, I'm there.

8 Q That is 8[a].

9 And then on Page 65 is the, "starting the
10 decoding of the video sequence from said first
11 image frame of the independent sequence..." and
12 then it continues on.

13 Do you see that?

14 A I do.

15 Q In preparing your opinions for your
16 declaration, when you read "starting the decoding
17 of the video sequence from said first image frame
18 of the independent sequence," does that first said
19 image frame have to be identified by the 8[a],
20 "decoding from the video sequence an indication of
21 at least one image frame, which is the first image
22 frame, in decoding order of an independent

1 sequence"?

2 MR. KENDRICK: Object to the form.

3 BY THE WITNESS:

4 A I believe that I've understood your
5 question, but would you mind restating it even
6 with the same language, just so I can unpack it?

7 BY MR. UDICK:

8 Q Sure. Is it -- and maybe I'll kind of
9 paraphrase it.

10 Is it your understanding that, to start
11 the decoding of limitation B, that it must --
12 first, there must be decoding from the video
13 sequence an indication of at least one image
14 frame, which is the image frame in decoding order
15 of an independent sequence?

16 MR. KENDRICK: Same objection.

17 BY THE WITNESS:

18 A So I assume here that we are talking about
19 claim language, not Kim?

20 BY MR. UDICK:

21 Q Correct.

22 A And so I will say that in at least some

1 embodiments, that can occur. But these are not,
2 in my opinion, ordered steps, so I don't think
3 that's a requirement.

4 Q And just so I have clarity, when you say,
5 "embodiments," are you speaking to embodiments of
6 the '321 patent?

7 MR. KENDRICK: Object to the extent it
8 calls for a legal conclusion.

9 BY THE WITNESS:

10 A That is what I meant, yes.

11 BY MR. UDICK:

12 Q Okay. If it's not required, how would --
13 how do you understand the phrase "from said first
14 image frame of the independent sequence" to be
15 identified from limitation 8[b]?

16 MR. KENDRICK: Same objection.

17 BY THE WITNESS:

18 A I have not considered this question
19 before, so I'm on the fly here.

20 But, you know, the embodiments that are
21 disclosed in the specification of the '321 do read
22 and decode that indication before they start the

1 decoding.

2 But the claims, you know, I don't want to
3 import limitations from the spec. The claim
4 itself does not require that, so perhaps -- and,
5 again, I'm just shooting from the hip here, so
6 maybe I'm not going to give you the most accurate
7 answer that could be obtained if I spent a lot of
8 time.

9 But shooting from the hip, you know, one
10 could envision a case where there is no random
11 access, there -- you're just playing a video from
12 start to finish and the decoder is decoding, and
13 so it practices 8[b].

14 And maybe it's not -- maybe it's not MPEG
15 or maybe it's, you know, some crazy standard we
16 haven't thought of or format, such that that
17 indication is somewhere else besides at the start
18 of this group.

19 So, you know, I don't know, I guess it
20 could read a bunch of frames and then hit the
21 indication in some crazy embodiment that's not
22 discussed in the spec and that I've never thought

1 of before this very minute, but I suppose it's
2 possible because the -- as I say, these are not
3 ordered steps.

4 BY MR. UDICK:

5 Q Okay. I wanted to go back briefly to your
6 discussion on some of the steps in Figure 4.

7 Specifically I think you mentioned in S34,
8 where it says, "detect address of corresponding
9 I-frame recorded with the P-frame data"?

10 A Yes, I see that.

11 Q And I think you mentioned earlier that --
12 and let me check the record to be sure -- you said
13 Kim as to...

14 So maybe I'll ask it a different way
15 because I thought you had mentioned it, and I
16 wasn't sure. Step S34, does it, at that
17 point -- strike that. See? Told you it was a bad
18 question.

19 At step S34 of Kim, is that when the
20 address of the corresponding I-frame is decoded in
21 your opinion?

22 A I believe that it is going to be decoded

1 before that. I believe it's going to be -- this
2 part -- by the "address," you mean the IAD, as Kim
3 calls it?

4 Q I'll let you answer that. Is that your
5 understanding of the address of the corresponding
6 I-frame?

7 A Yeah, so the IAD --

8 THE WITNESS: Sorry?

9 MR. KENDRICK: Sorry. Object to the form.

10 BY THE WITNESS:

11 A The IAD and -- what is it called, the CAD,
12 the other address, as shown in Figures 5 and 6,
13 those -- it's my opinion that those are
14 also -- you know, those are going to actually be
15 decoded out of the bitstream at S23. Or
16 thereabouts, maybe in a place not shown in
17 Figure 4.

18 And the reason that I say this is because
19 Kim's spec states that the decoder, or the
20 reproducing unit, processes this bitstream, and in
21 order to find -- in order to find the requested
22 image, it's got to look at those numbers.

1 Or at least that is a feasible way that an
2 ordinarily skilled artisan would understand that,
3 in order to find the requested picture, you need
4 to look at those numbers, so they would need to be
5 decoded either in that loop at S23, or else
6 somewhere, if I look at Kim -- I'll be more
7 specific.

8 You know, it's possible that that could
9 occur in Figure 2 in the recording reproduction
10 unit or the demux, but it's going to have to occur
11 somewhere.

12 BY MR. UDICK:

13 Q And that's a -- I'm sorry. Were you
14 finished?

15 A That's -- well, it's going to occur before
16 you hit S34.

17 Q Okay.

18 A So S34 is going to utilize that, but I
19 think it has to be decoded.

20 Q And Figure 2, just for the record, that
21 is -- the patent describes Figure 2 as a "block
22 diagram of a time lapse recording apparatus

1 according to an embodiment of the present
2 invention" in column 2, lines 39 to 40; is that
3 right?

4 A Let me check you just to make sure, but
5 I'm --

6 Q Sure.

7 A -- you're right, but I'm going to check
8 it.

9 Q Please do.

10 A 2:39, 40.

11 I agree.

12 Q We talked about 4. So, "Figure 4
13 illustrates a flow chart depicting a reproduction
14 method for reproducing compressed intermittent
15 data recorded on an optical disk according to the
16 present invention." Column 2, line 44, or 45,
17 continuing on for four lines after that.

18 Is that correct?

19 A I'm guessing that it is, but let me tell
20 you that my screen said that your internet
21 connection is unstable, and I lost you in the
22 middle of that.

1 Q Oh, I'm sorry.

2 A Not your fault.

3 Q What I was pointing to, describing
4 Figure 4, it says, "Illustrates a flow chart
5 depicting a reproduction method for reproducing
6 compressed intermittent data recorded on an
7 optical disk according to the present invention."

8 A That is what it says on my copy of the
9 patent, too.

10 Q Great.

11 And that's essentially the decoding side;
12 would you agree?

13 MR. KENDRICK: Object to the form.

14 BY THE WITNESS:

15 A Well, Kim uses the word "reproducing," and
16 so I think there's a small claim construction
17 issue here regarding exactly what decoding means
18 as compared to reproducing. But, roughly, roughly
19 speaking, that's correct.

20 And I use the word "roughly" because
21 there's -- you know, there's this issue of, well,
22 exactly where is it that Kim first reads that IAD

1 in the CAD. And it needs to be read in order to
2 read the bitstream off of the optical disk medium
3 shown at the upper right of Figure 2 and to read
4 through there and identify the requested image.

5 So it has to happen somewhere early on,
6 but whether that piece of the decoding actually
7 occurs in the flow chart of Figure 4, say, around
8 that loop at S23, or whether it occurs, you know,
9 no -- I don't want to think of it as being there,
10 I want to think of it for my embodiment, let's
11 say, as being somewhere around where the
12 reproducing unit reads the data off the disk or
13 the demux process in Figure 2, okay. But -- so
14 I'm saying that that is definitely decoding, but
15 it may not be shown in Figure 4.

16 BY MR. UDICK:

17 Q Okay. I think I understand what you're
18 saying.

19 Just speaking in similar terms, in the
20 '321 patent, do you understand that the claims at
21 issue are all decoding claims?

22 A I'll go with yes. They all are saying a

1 decoding method and implementations thereof.

2 Q One is a method, one is a system, and I
3 think one is a computer --

4 A Computer program product.

5 Q Exactly. Yeah.

6 And speaking in the '321, decoding is
7 reading the bitstream -- at least in a very basic
8 sense, reading the bitstream and re-creating the
9 data that was encoded; is that correct?

10 A Yes. I would even simplify it and say
11 that decoding is when -- is a box that has a
12 bitstream for input and the output is video.

13 Q Perfect.

14 When you reviewed Kim in Figure -- and
15 Figure 4 and it described Figure 4 as a method for
16 reproducing compressed, quote, intermittent data
17 recorded on optical disk, what did you understand
18 intermittent data to be?

19 MR. KENDRICK: (Inaudible.)

20 (Reporter clarification.)

21 MR. KENDRICK: Object to the form. Legal
22 conclusion.

1 Apologies about that.

2 BY THE WITNESS:

3 A So Kim -- as you know, Kim is a little bit
4 weird. It's not your average consumer video.
5 What Kim is, for example, is a system that could
6 be used as a security camera system.

7 And so Kim's video is not
8 30-frames-a-second consumer video; Kim's video
9 might take one frame a second or even less. The
10 camera might run at 30 fps, frames per second, but
11 Kim's device isn't going to record that; Kim's
12 device is only going to intermittently record
13 frames.

14 So it is video. In column 1, Kim, you
15 know, starts out by saying this is a device for
16 video, but you have to understand that the video
17 has a much larger time increment between frames
18 than what your typical consumer video has.

19 So I'll -- I talked a lot, so let me
20 summarize and say intermittent means that there
21 may be a long time interval between the recorded
22 frames in Kim's video.

1 BY MR. UDICK:

2 Q Right. And when you mentioned in column 1
3 that Kim -- that it's a device for video, I read
4 the sentence, "to a device and method for
5 recording and reproducing video data on and from
6 an optical disk using the time lapse
7 recording/reproduction process." Is that where
8 you were referring?

9 A Yes.

10 Q In your understanding of Kim, does it
11 disclose reproducing video as a streaming video?

12 MR. KENDRICK: Object to the form.

13 BY THE WITNESS:

14 A I believe that it does. And I'm going to
15 have to think hard to remember the references in
16 Kim's spec, where Kim refers to playing back
17 multiple pictures.

18 So right now what I'm doing is looking for
19 it. And I'll spend a short amount of time, and if
20 you want me to stop looking, you just say so, and
21 I will stop.

22

1 BY MR. UDICK:

2 Q Okay.

3 A There aren't very many columns, so I
4 should be able to find it quickly.

5 So at 2 -- column 2, lines 6 through 9,
6 Kim states that, "Another object of the present
7 invention is to provide a reproduction method for
8 reproducing compressed intermittent data from a
9 recording medium."

10 And so, in my opinion, when Kim refers to
11 compressed intermittent data, that is a plurality
12 of images.

13 And I have at least one more, and if
14 you'll just give me a second more.

15 Q Okay.

16 A So this is also reflected in Kim's
17 specification in column 6 beginning at line 16
18 where Kim recites, "When the recording and
19 reproduction of a moving picture is carried out by
20 a camera, such as a CCD" -- I said that poorly --
21 "CCD, a CCTV, et cetera, only the desired
22 images" -- plural -- "can be selectively

1 reproduced with high display quality."

2 So I believe, and it is my opinion, that
3 when an ordinarily skilled artisan reads this on
4 the priority date, their understanding is going to
5 be that Kim produces intermittently recorded
6 images and moving pictures, both of which imply
7 more than one, a plurality and video.

8 And, again, this word "intermittently"
9 occurs there, meaning that this video is not like
10 30 fps, frames per second, consumer video, but
11 it's video where the -- you know, if you play it
12 back at 30 frames per second on a conventional
13 playback device, it's going to be looking very --
14 like it's very fast because maybe it was only one
15 frame per every 5 seconds, say, was recorded.
16 But, still, it's playback -- poor choice -- it's
17 reproduced by Kim as moving pictures.

18 And so that, I believe, is a plurality and
19 that's video.

20 Q Okay.

21 MR. UDICK: I think we've gone about an
22 hour, so why don't we take a quick five-minute

1 break, if that works?

2 THE WITNESS: Thank you. Perfect for me.

3 (WHEREUPON, a recess was had.)

4 BY THE WITNESS:

5 A Given that we're back on the record, I
6 would like to inform you that during the break I
7 very quickly looked at Kim again, and I would like
8 to make a small supplement to my last answer, if
9 you'll permit that.

10 BY MR. UDICK:

11 Q Which -- what is it in reference to?

12 A Why I'm opining that Kim decodes moving
13 pictures and video.

14 Q Okay. Go ahead.

15 A The references in Kim's specification at
16 column 1 -- I mean, the first paragraph, so it's
17 basically like lines 2 through 11 or 12, but the
18 line number's between, so I'm not sure exactly
19 which one.

20 But that first paragraph, what it says
21 is -- and I should have seen this when you asked
22 me before, but I'm just -- you know, we're in a

1 deposition, so I'm not working as well as I should
2 be on some of these things, but --

3 Q Sure.

4 A -- it says that, [as read] "The present
5 invention relates to a time lapse recording and
6 reproducing method for optical disks, and more
7 particularly, to a device and method for recording
8 and reproducing video data on and from an optical
9 disk using time lapse process."

10 So really that is the one -- that is what
11 primarily led me to the opinion that Kim
12 reproduces video because Kim says it right there.

13 And video, I think it is my opinion, that
14 a POSITA, upon reading the words, "reproduces
15 video," that that person of ordinary skill would
16 understand that Kim is going to reproduce -- at
17 least in some instances, Kim is going to reproduce
18 a sequence of images which sort of requires
19 repeating the flow chart in Figure 4.

20 Q You're talking the portion that says
21 "reproducing video data"; is that correct?

22 A That is exactly what I'm talking about.

1 Q Would you agree that an image frame that
2 is decoded from an encoded video would still be
3 video data but not a video?

4 MR. KENDRICK: Object to the form.

5 BY THE WITNESS:

6 A Well, if I understood your question --
7 which I'm not sure I did -- then my answer is that
8 encoded video data, well, it started as video
9 data, but now it's not video data anymore; it's an
10 encoded bitstream from which video could be
11 recovered.

12 BY MR. UDICK:

13 Q Could the term "video data" encompass one
14 frame of an encoded video?

15 A Yes. And the reason I say this is
16 because, for example, even an MPEG-1, it is
17 allowable for a video sequence to consist of a
18 single I-frame.

19 Q And if we would go back to Figure 4, you
20 can look at the declaration on 60.

21 A I am there.

22 Q Okay. And we're thinking about how Kim

1 works, a user requests some -- let me make sure I
2 get the term right.

3 So column 5 refers to S20 -- the S21 step
4 and S22, "If the user requests reproduction of an
5 image data from a particular camera or channel
6 among the intermittent image data recorded on the
7 optical disk."

8 So do you understand -- is it your
9 understanding that this process starts when a user
10 selects some frame and Kim begins Figure 4?

11 MR. KENDRICK: Object to the form.

12 BY THE WITNESS:

13 A Yes, that is my understanding. And I
14 would like to clarify it by saying Kim, however,
15 doesn't tell us or doesn't restrict us on how that
16 user request occurred.

17 So we don't know if that happens through
18 some user interface with a window that says, you
19 know, "I want frame 5,000" or whether that happens
20 under control of some software that says, "Play me
21 back 2:00 to 3:00 from last Sunday."

22 And I don't think that that part of it is

1 really part of Kim, so however those requests
2 come, you know, Kim processes them and fulfills
3 them. But Kim's invention does not provide that
4 means of generating the user request; Kim's
5 invention receives the user request and services
6 it.

7 BY MR. UDICK:

8 Q Right. And so the first step that Kim
9 takes in doing this is it's going to start the
10 decoding of whatever frame or image that the user
11 requested by whichever manner that that happens,
12 like you just talked about; is that right?

13 A I agree.

14 Q And if that is a P-frame, it follows the
15 process from S21 and then it hits, you know,
16 through S32 and then hits what you denote as the
17 blue path; is that correct?

18 A Yes.

19 Q And if the user, say, gets that request,
20 the next time they request another one and somehow
21 they request the very next P-frame in the
22 bitstream, when it does that -- when the user does

1 that, Figure 4 does not refer back to the P-frame
2 it just generated; it goes back to the I-frame
3 again. Is that correct?

4 MR. KENDRICK: Object to the form.

5 BY THE WITNESS:

6 A That is Kim's teaching. And, moreover, in
7 your first P-frame, that I-frame would have been
8 stored, and so one could argue that, well, you
9 ought not read that I-frame back again because
10 you've already stored it.

11 But if you follow Kim literally from the
12 teaching of the embodiments that are disclosed in
13 the spec, those embodiments at least will go back
14 and read that I-frame again from the disk and
15 restore it for your second P-frame.

16 BY MR. UDICK:

17 Q Right. And so if you look at Figure 5A,
18 that you have -- I guess it's on the opposite page
19 that you have marked -- or you have it annotated
20 with some colors, right?

21 A Let me get there. I just called it up in
22 the patent.

1 Q Okay.

2 A You're saying in the next page?

3 Q It's on Page 59 of your declaration.

4 A Yes, sir, I am there. Page 59, Figure 5A.

5 Q If the Kim device were to reproduce every
6 image in that frame, it would refer back to that
7 I-frame five times; is that correct?

8 A Absolutely correct.

9 Q In S32, what is your understanding of how
10 Kim determines whether or not the requested frame
11 is a P-picture?

12 A So my opinion is that Kim is going to
13 determine that -- let me rephrase.

14 My opinion is that Kim may determine that
15 from hitting the IAD of zero.

16 Now, Kim has alternative teachings where
17 the IAD for an I-frame can be absent in some
18 embodiments or in other embodiments can be encoded
19 as a zero. And so we're talking about, and my
20 opinion is relying on, the embodiments where
21 Kim's -- we're using Kim's teaching that the IAD,
22 or an I-frame, will be zero.

1 And I've already said today in response to
2 an earlier question that, you know, Kim recites
3 that the bitstream is read and reproduced, and so
4 there's a question of how Kim detects when the
5 device has hit the requested picture. And my
6 opinion on that is that an ordinarily skilled
7 artisan would understand that Kim may achieve that
8 by decoding the two-part logical address early on,
9 before we get down into the meat of Figure 4, just
10 as a way of scanning to find the right picture
11 that's been requested.

12 And so, you know, again, whether that
13 occurs around that diamond at S23 or whether it
14 occurs outside of Figure 4, I don't think it's
15 really clear, but it needs to occur to find the
16 right picture.

17 And so what I'm saying is that Kim will
18 have the capability to detect that I-frame upon
19 reading an address, a logical address, that has an
20 IAD of zero.

21 Alternatively, there are other ways that
22 Kim could also detect it. We're not really sure

1 the extent to which Kim exactly requires the
2 implementation of MPEG. We know it's not a
3 100 percent MPEG implementation because there's --
4 there's going to be at least some tweaks, but if
5 Kim implements the frame type code of the MPEG
6 picture header from MPEG, then that would be
7 another possibility for a way that Kim may
8 alternatively or jointly detect an I-frame or be
9 able to distinguish it from a P-frame.

10 Q And we -- you talked about a couple things
11 here, so I want to break that down.

12 One is you talked about a skilled artisan
13 would understand that Kim may achieve kind of a
14 question of how Kim detects when the device has
15 hit the requested picture, and that your opinion
16 that an ordinarily skilled artisan would
17 understand that Kim may achieve that by decoding
18 the two-part logical address early on before we
19 get into the meat of Figure 4, right? That's one
20 thing you talked about, correct?

21 A You almost recited my words. That was
22 great.

1 Q Luckily I have a real-time that tells me
2 what your words were.

3 Would you agree that that's not disclosed
4 in Kim, explicitly?

5 MR. KENDRICK: Object to the form.

6 BY THE WITNESS:

7 A I would have to go back and read Kim, you
8 know, all, whatever it is, 10 columns really
9 carefully to bet my life on an answer to that
10 question, but I think it's not -- it's not really
11 explicitly said in the spec, you know.

12 Kim discusses that these addresses are
13 present. Kim discusses that the reproducing
14 unit -- Kim's decoder, if you will, even though
15 Kim has a box that says decoder, but the decoder
16 that we're talking about is really more than
17 that -- Kim says that the reproduction process
18 reproduces the data structure of Figure 6, and in
19 order to populate and reproduce the data structure
20 of Figure 6, Kim must decode the logical address.

21 BY MR. UDICK:

22 Q And is that anywhere in your declaration?

1 A I believe that it is. And if I go
2 "control F" on my declaration, I can probably find
3 it pretty quickly. Shall I do that?

4 Q Sure.

5 A I'm almost done.

6 So in my declaration at Paragraph 152, and
7 specifically on the second page of that, which
8 occurs at the top of the page which is numbered in
9 the document as 65 -- I'll pause until you can get
10 there.

11 Q I'm there.

12 A Okay. So starting at the last word of
13 Line 1 on this page, "and that Figure 6 shows an
14 example of a data structure of the bitstream shown
15 in Figure 5A..." and then here I make citation to
16 Kim at 4:59 to 61.

17 And so when we go to Kim at 4:59 to 61,
18 Kim says, "Figure 6 shows an example of a data
19 structure of the bitstream shown in Figures 5A and
20 5B to be recorded and reproduced on and from the
21 optical disk medium."

22 And so that citation to Kim at 4:59

1 through 61 is my basis for saying that Kim's
2 decoder has to populate that data structure that's
3 shown in Figure 6, and in order to populate it,
4 Kim has to decode each element of that data
5 structure, including the IAD -- and I believe I'm
6 correct when I say it's the CAD, but let me just
7 look at the -- yeah, the IAD and the CAD must both
8 be decoded in order to populate that data
9 structure, which Kim, at 4:59 through 65, teaches
10 is reproduced by Kim's decoder.

11 Q Wouldn't the way to seek and reproduce the
12 requested frame be by identifying the physical
13 address that's in Figure 6?

14 MR. KENDRICK: Object to the form.

15 BY MR. UDICK:

16 Q Kim discloses recording onto an optical
17 disk, which is a physical media, right?

18 A Correct.

19 Q And the way one would seek into a physical
20 media would be, for example, going into the
21 physical address of where that information is
22 stored, correct?

1 MR. KENDRICK: Object to the form.

2 BY THE WITNESS:

3 A At the low level of the device, yes, I
4 agree.

5 BY MR. UDICK:

6 Q Right. Because the opposite would be, if
7 you had to decode something to first determine
8 whether or not you had the right frame, it could
9 be an incredibly inefficient process, in that you
10 would decode and decode and decode until you found
11 it, right?

12 MR. KENDRICK: Same objection.

13 BY THE WITNESS:

14 A Well, this is something which is left by
15 Kim as something that needs to be filled in by the
16 POSITA exactly how that's going to occur.

17 And, you know, one can contemplate some,
18 you know, device that is based on Kim -- a
19 derivative of Kim, let's call it -- that has some
20 kind of a look-up table stored somewhere that
21 might allow one to make a direct access without
22 doing any seeking on that device, using a physical

1 address, as you said.

2 And, yes, I mean, we can sit here and
3 invent things, but that's not in Kim. And so
4 based on what Kim gives us, I believe that a
5 POSITA would understand that there must be some
6 kind of an equivalence between that physical
7 address and the two-part logical address so that
8 the logical address can be translated into a
9 physical address and vice-versa.

10 And, you know, as I say, Kim does not
11 explicitly disclose how this might happen, nor
12 does Kim's device, you know, tell us anything
13 about how that physical read occurs.

14 And this is why I'm saying that there's
15 something going on either in the loop at S23 of
16 Figure 4 or between the optical disk and up to and
17 including the demux in Figure 2 that, you know,
18 something is going on there to get the right -- to
19 read the bitstream and arrive at the correct
20 location.

21 And that -- well, it has to occur. You
22 know, I think we both agree it has to occur.

1 Exactly how that occurs is not disclosed.

2 Q Got you.

3 A You know, while we're silent here and a
4 pause, I will just go ahead and supplement that as
5 well and say that, you know, when I look at
6 Figure 5A, for example, each picture, be it an
7 I-picture or a P-picture, has an IAD and a CAD.
8 And comparing that to Figure 6, there's a physical
9 address which corresponds to the CAD component of
10 the logical address.

11 And there's a camera code which is not
12 shown in Figure 5A, but it is shown in Figure 5B.

13 And then there's the corresponding
14 I-picture address shown in Figure 6, which is,
15 again, the IAD.

16 So there's, you know, at least strongly
17 implied here a very close and direct
18 correspondence between the logical and physical
19 address, and that's what I'm referring to.

20 Q Just scrolling through Kim one last time
21 to make sure I have no more questions there, so
22 apologies for the little bit of delay.

1 A It's fine with me. I already delayed you
2 by a lot, so payback is fair.

3 Q Okay. Let's move on to MPEG-1. And this
4 will take a second probably. So I am uploading
5 Exhibit 1005, which is ISO/IEC 11172-2, formerly
6 MPEG part two, the video part, but -- which we've
7 all, in the petition and today, we've been talking
8 about just as MPEG-1.

9 And it's a larger file so it may take a
10 minute or two.

11 THE WITNESS: Would you accept a friendly
12 proposal to take five while that occurs and let me
13 run down the hall again?

14 MR. UDICK: Let's do ten because I
15 probably need more than five, but yeah.

16 (WHEREUPON, a recess was had.)

17 (WHEREUPON, Exhibit No. 1005 was presented
18 to the witness.)

19 BY MR. UDICK:

20 Q Welcome back, Dr. Havlicek. Like I said,
21 I think we're going to turn over to MPEG-1, and
22 I've dropped Exhibit 1005 in the chat. If you

1 could open that and take a look, and let me know
2 once you have access.

3 A I have it now.

4 Q Great.

5 And can you access and get through it
6 easily?

7 A I believe so. I have it up on two
8 computers because I also have the clean copy that
9 was an exhibit in my declaration on your computer.

10 Q Great.

11 So I just want to start with some basics.
12 So if you would turn to Paragraph 59 of your
13 declaration. I think that happens on Page 26
14 through 27.

15 A I am at Paragraph 59.

16 Q Great.

17 And I want to make sure we have an agreed
18 understanding of what, kind of, MPEG-1 standard
19 is.

20 So you state, "It 'specifies a syntax for
21 coded video bitstream'" at the bottom of Page 26
22 within Paragraph 59.

1 Do you see that?

2 A I do see it.

3 Q What do you mean -- or how do you
4 understand the term "specifies a syntax for a
5 coded video bitstream"?

6 A So the syntax may be thought of as a set
7 of rules for what bit patterns are allowable in
8 the bitstream, and for the allowable bit patterns,
9 what they mean. And MPEG-1 defines this for the
10 MPEG-1 bitstream.

11 Q Got it.

12 And then it also defines the process for
13 decoding that bitstream. You also cite to 15 and
14 then to 18 as well, right?

15 A Yeah, 15 for the syntax and 18 for the
16 decoding.

17 Q So if you look at --

18 A I'm sorry. 15, you're correct.

19 Q Yeah.

20 A I interrupted you. I apologize. I know
21 that's hard on everybody.

22 Q Oh, no worries. I think that was a

1 relatively clean one, so we were still good there.

2 So if you look at Page 15 -- and, again,
3 this is Page 15 as numbered by petitioner as
4 opposed to, kind of, the internal reference
5 numbers of the standard -- there's a 0.4 section
6 for "Decoding," right?

7 A I just got there, but it's passing it
8 because I did too many finger swipes.

9 Okay. I am -- it turns out those are the
10 PDF page numbers, so I should have just typed in
11 15.

12 You're referring to the bottom, "0.4
13 Decoding"?

14 Q Yes.

15 A I'm there.

16 Q And similar to what you talked about, it
17 defines the process. Also in MPEG-1 it says, "The
18 decoding process is defined by this part of..."
19 MPEG-1 essentially, right?

20 A Correct.

21 Q And so an MPEG-1-compliant decoder has to
22 follow these syntax rules that the MPEG-1 sets

1 forth; is that right?

2 MR. KENDRICK: Object to the form.

3 BY THE WITNESS:

4 A That's roughly correct. There's a little
5 detail, which is that some parts of the syntax
6 rules are optional so that every -- so if you have
7 a company X and your company -- that's a poor
8 choice because the -- if you have a Company Y,
9 then, you know, your Company Y might produce a
10 decoder and market it as a compliant decoder, even
11 though it doesn't implement the optional parts of
12 the standard.

13 And there's sort of other intricacies.
14 You know, there's certain -- you know, now it
15 escapes me exactly what it's called in MPEG-1, but
16 if all the parameters are within a certain set of
17 specified values, then you get a certain level of
18 decoder and you can claim you're compliant, even
19 though you don't comply with all the syntax rules.

20 So now I've blabbed for a long time again,
21 let me summarize it by saying, yes, roughly when
22 you say you have an MPEG-1-compliant decoder, it's

1 able to understand those rules and decode them.

2 But that's to within the caveat that there
3 are optional parts and there -- you know, there
4 are parts that some encoders may implement a
5 certain annex and others don't, so -- but roughly
6 that's correct.

7 Q Got it.

8 So maybe breaking it down, so the decoder,
9 it responds to the syntax elements in the
10 bitstream?

11 A Right.

12 MR. KENDRICK: Object to the form.

13 BY THE WITNESS:

14 A Well, if by "responds," you mean decodes,
15 yes.

16 BY MR. UDICK:

17 Q Yeah, it -- sorry. Yes, it --

18 A It inputs that bitstream, which is
19 compliant.

20 Q Right.

21 A And it understands everything that's in
22 there. And it produces as output the video -- the

1 reconstructed video frames, which, because it's a
2 lossy standard, they're not exactly the same as
3 the originals, but they're approximately the same
4 as the originals.

5 Q Right. And within required aspects of the
6 standard, there can be, kind of, different forks
7 as to what a decoder may encounter in the
8 bitstream; is that right?

9 MR. KENDRICK: Object to the form.

10 BY THE WITNESS:

11 A To the extent that I understand the
12 question to mean that, from a certain syntax
13 element, there might be a bitstream where it goes
14 this way or there might be a bitstream where it
15 goes that way -- and by "this way" and "that way,"
16 I mean that the next syntax element might be
17 different in two different bitstreams or in two
18 different locations for the same bitstream -- to
19 the extent that that's what you mean, the answer
20 would be yes.

21 Q And I think another way to do it is if we
22 would turn to your declaration at 50. At

1 Paragraph 50 of your declaration, Page 19.

2 A I am at Paragraph 50.

3 Q And here you have kind of the sentence
4 that ends at 19 that says, "To this end, MPEG-1
5 described ways to encode groups of pictures to
6 ensure that they were independently decodable and
7 still compliant with the MPEG-1 standard," citing
8 to Page 85, right?

9 A Yes, that's correct.

10 Q And so within the standard, there is
11 groups of pictures that are independently
12 decodable and groups of pictures that are not
13 independently decodable; is that correct?

14 A Well, I'm not sure that I can agree with
15 exactly the way that you stated it, but I would
16 offer a restatement, if you'll entertain that.

17 Q Let me just rephrase it.

18 There are instances where groups of
19 pictures can refer to previous groups of pictures
20 for decoding; is that correct?

21 A Again, I would say that there may be.
22 That's allowable.

1 Q Right. I'm sorry. That's my -- that was
2 my question. Not that it occurs every time, but
3 that it's allowable as -- for the encoder, right?

4 A It is perfectly fine if an encoder wants
5 to make what's called an open GOP, a group of
6 pictures, that makes reference, for example, to
7 pictures outside the group; that's allowed, yes,
8 if the encoder wants to do it.

9 Q And the -- and an MPEG-1 decoding --
10 MPEG-1-compliant decoder would have to, you
11 know -- to maintain that compliance, would have to
12 decode that scenario, those open GOPs, right?

13 MR. KENDRICK: Object to the form.

14 BY THE WITNESS:

15 A Yes, a compliant decoder -- well, okay. A
16 compliant decoder can decode that, unless, for
17 example, there's a flag in the GOP header called
18 the broken link flag. And if the broken link flag
19 is set to 1, well, then the decoder will fail, and
20 the decoder will generally discard B frames
21 preceding the first I-frame in that case.

22 And then it may occur that, you know,

1 there's an error condition. And error conditions
2 aren't covered by the standard, but a practical
3 decoder if you have, again, Company Y and you're
4 producing a decoder, you're going to probably
5 program something into it to make it react to
6 that, but it won't, again, be able to correctly
7 decode.

8 That being said, the normal condition is
9 that when you encounter an open GOP, what it means
10 is that there's some B-pictures at the beginning
11 that refer to I-frame or a P-frame in the previous
12 GOP. The previous GOP can end with a P or it can
13 end with an I. And so those initial B-pictures
14 may refer back, and that's outside the GOP -- it
15 is outside the GOP of the B-picture that's being
16 decoded at the beginning of your current GOP.

17 And so that's allowed. And, yes, the
18 decoder decodes that correctly unless the
19 instances, the special cases that I already said.

20 BY MR. UDICK:

21 Q Right. And that being --

22 A Broken link flag or there was a dropped

1 frame error.

2 Q Right --

3 A Excuse me. Dropped -- you know, dropped
4 blocks, dropped bits.

5 Q Right. And the decoder processes that
6 bitstream as it comes, right? It decodes it in
7 the order that it receives it, right?

8 MR. KENDRICK: Object to the form.

9 BY THE WITNESS:

10 A You know, I don't know that that's
11 required in the implementation. For example,
12 people have made parallel implementations where it
13 might be decoding multiple parts at the same time
14 and blah, blah -- I shouldn't say "blah, blah."
15 Sorry about that.

16 Multiple -- parallel implementations might
17 be decoding a multiplicity of sections of a
18 bitstream at the same time, but the general basic
19 understood MPEG decoder processes the bitstream in
20 what's called bitstream order, which is exactly
21 the way the bits are stored on the medium or in
22 the transmission channel, as you said.

1 Q Can an MPEG-1-compliant bitstream or an
2 MPEG-1-compliant decoder when reading in bitstream
3 order, you know, be able to just reject a portion
4 of the bitstream and not decode it, outside of an
5 error condition?

6 MR. KENDRICK: Object to the form.

7 BY THE WITNESS:

8 A Under the normal basic vanilla conditions,
9 it shouldn't do that. However, again, there are
10 special cases. And the special cases that can
11 occur are you may have enhancement and
12 scaleability layers that are optional, and so the
13 decoder may reject those optional scaleability
14 enhancement bits.

15 And in addition to that, in streaming
16 applications, which the '321 patent specifically,
17 you know, calls out as one application area, it
18 happens sometimes that either the decoder can't
19 keep up or the channel can't accommodate the
20 bandwidth to transmit everything.

21 And so then it was commonly understood at
22 this time that the reason you didn't want to ever

1 use B-pictures as reference is because you can
2 drop them. So if you need -- if the decoder can't
3 keep up and you need to lower the bitrate, you can
4 drop B-pictures. That can be done at the network
5 node or it could be done at the server or if it's
6 a real-time TV, say, it can be done by the
7 encoder.

8 The decoder itself, which is what you were
9 really asking about, could, by itself, decide:
10 I'm not keeping up. I can't decode all this. I'm
11 going to start dropping B-pictures.

12 And that would be allowed.

13 But, in my mind, those -- you would still
14 have a compliant decoder, but, in my mind, those
15 are sort of special cases. And the normal case
16 that we think of is that, yeah, the decoder is
17 supposed to decode everything.

18 Q And what we've been talking about there
19 is, kind of, bitstream order. Does that make
20 sense? Does that term make sense to you?

21 A I understand what you mean by "bitstream
22 order," and that term is, in fact, used in the

1 standard, so I think everyone understands what it
2 is.

3 Q And the other order that is discussed in
4 the standard is the display order; is that right?

5 A Yes, sir; that is correct.

6 Q What is the display order in the MPEG-1
7 standard?

8 A The display order is the order in which
9 the pictures are to be displayed; for example, put
10 up on your TV screen. And that corresponds
11 exactly to the order that the pictures were at the
12 beginning before they were coded.

13 However, what happens if during the
14 encoding process, if you have B-pictures, they may
15 take reference or prediction from a future
16 picture, and when that occurs, then the encoder
17 has to reorder the frames so that the reference
18 picture, which comes later, can be decoded before
19 the B-picture that depends on it in bitstream
20 order, even though that reference picture will be
21 displayed after said B-picture.

22 So, in a nutshell -- again, because I

1 talked for so long -- to just tie it up, the
2 encoder may, if there are B-pictures, reorder the
3 pictures, and so then the decoder has to decode
4 and then buffer and then reorder into display
5 order.

6 So there's a difference between the order
7 that the pictures are in the bitstream, which is
8 also synonymously called the decoding order,
9 because, as you said, a typical decoder process is
10 to bitstream serially. There's a difference
11 between that order and the order that the frames
12 have to be displayed or the pictures have to be
13 displayed.

14 Q Right. And some of the examples that
15 we've been talking about and the differences
16 between display and bitstream order are shown
17 at -- well, I had the reference.

18 If we look at Page 71 of the standard.

19 A I'm there.

20 Q And Figures D3 and D4 show the same set of
21 pictures but in their differing orders; is that
22 right?

1 A Correct. Yes.

2 Q And the same is true in -- if we go to
3 Page 87 of the standard. And D.5.3.2. And
4 specifically Figure D.19.

5 MR. KENDRICK: Sorry, Steve. It looks
6 like Professor Havlicek's Zoom just went off for
7 some reason. There's some issues with the
8 network, and he's trying to reconnect. Let's go
9 offline for a second.

10 MR. UDICK: That works.

11 (WHEREUPON, a recess was had.)

12 BY MR. UDICK:

13 Q So just to restate the question, so I was
14 pointing to Page 87 of MPEG-1, and specifically
15 Figure D.19.

16 And let me know when you're there.

17 A I'm there.

18 Q And Figure D.19, as I look at it, shows
19 three different examples of bitstreams, each of
20 them showing how it looks in display order versus
21 decoding order.

22 Is that a fair synopsis of that figure to

1 you?

2 A I agree. And, yeah, I think you stated it
3 perfectly.

4 Q And that's under the heading of "Temporal
5 Reference," right?

6 A Correct.

7 Q And what is a temporal reference in
8 MPEG-1?

9 A The temporal reference is an integer 10
10 bits in representation that gives the display
11 order. And it's part of the picture header. So
12 every picture has a temporal reference, such that,
13 at the decoder, from the temporal reference, you
14 can deduce the display order.

15 And the reason that this is important to
16 have there is because, as we just said, the
17 encoder may reorder the pictures in order to get
18 forward references to have their reference picture
19 before said current picture in the bitstream, but
20 that reference picture has to be decoded first,
21 saved, and then displayed later.

22 And in order for the decoder to figure all

1 of this out, it needs to know what's the display
2 order, and that's encoded into these bitstream by
3 giving each picture a 10-bit-integer temporal
4 reference. They increment by one with each
5 picture.

6 Q And if we turn in your declaration to
7 Page 36 and -- well, let's just skip ahead to
8 Page 38 and Paragraph 88.

9 A I am at Paragraph 88.

10 Q Great.

11 And so this is -- so you take the decoding
12 from the video sequence limitation and subpart it
13 out to analyze, kind of, certain pieces of it,
14 right? And then put it back together, right?

15 MR. KENDRICK: Object to the form.

16 BY THE WITNESS:

17 A Well, I think that you're saying that this
18 is the piece of limitation that's a lower
19 numeral -- Roman Numeral ii.

20 BY MR. UDICK:

21 Q Correct.

22 A Which, as you said, it's not the whole

1 limitation, it's decoding -- it's what it says it
2 is.

3 Q Right. So Roman Numeral ii in yours that
4 starts with Paragraph 88, here you address part of
5 the limitation that says, "decoding from the video
6 sequence an indication of at least one image
7 frame, which is the first image frame in decoding
8 order of an independent sequence," right?

9 A Yes, I agree.

10 Q And you point to MPEG-1's closed G-O-P
11 flag, or closed GOP flag; is that correct?

12 A Yes, as one alternative. And in
13 paragraph --

14 Q Correct.

15 A -- that is the one, the closed GOP flag,
16 yes.

17 Q And later, you have alternatively the
18 temporal reference, right?

19 A That's correct. Yes.

20 Q So turning to this -- to the closed GOP
21 flag portion, the question I have is how is the
22 closed GOP flag an indication of at least one

1 image frame?

2 A As follows: MPEG-1 teaches that an
3 encoder can construct closed GOPs, closed groups
4 of pictures, by omitting any B-pictures prior to
5 the I-picture that begins the GOP in decoding
6 order.

7 So maybe I'll just expand that just a
8 little bit. Every GOP is going to have an
9 I-picture as its first picture in bitstream order,
10 but there may -- it's allowable to have B-pictures
11 prior to that in display order. And so if those
12 B-pictures are looking for reference from the
13 previous GOP, then it wouldn't be a closed GOP.

14 But MPEG-1 specifically and explicitly
15 teaches that the original idea of the closed GOP
16 and of the GOP itself was to facilitate random
17 access, and in order for that to happen, the GOP
18 has to be independently encodable. And in order
19 for that to happen, you can't have those
20 B-pictures to begin with.

21 So MPEG-1 explicitly and -- it says it.
22 It says that the encoder, nevertheless -- it uses

1 the word "nevertheless" -- the encoder can create
2 closed GOPs that are independently encodable by
3 not having those B-pictures.

4 So if, you know, within that teaching we
5 contemplate an encoder that it understood to only
6 produce closed GOPs that begin with an
7 I-picture -- not all closed GOPs do, but if we
8 understand that this particular encoder made by my
9 company, Company Y, is going to follow the
10 teachings of MPEG and produce an encoder that only
11 encodes what we call exemplary closed GOPs that
12 start with an I-picture, then every GOP has the
13 property that the GOP header will contain the
14 closed GOP flag.

15 And because we know, following the
16 teachings of MPEG-1, that this GOP is going to
17 start with an I-picture, then an I-picture will
18 immediately follow the GOP header immediately
19 following that flag, and that flag, therefore,
20 indicates that -- and, you know, I understand that
21 we can debate exactly the claim construction of
22 "indicates," but my interpretation of what the

1 plain and ordinary meaning would be to an
2 ordinarily skilled artisan is that "indicates"
3 means: Shows that it's there.

4 And if you have an encoder that's
5 following -- you know, producing an
6 MPEG-1-compliant stream where all GOPs are closed
7 GOPs that begin with an I-frame -- which is what
8 we call an exemplary or closed GOP -- then it is
9 always the case that if a decoder sees that closed
10 GOP flag, the next picture is the I-picture that
11 was the first picture of the GOP. The GOP being
12 the independently decodable sequence.

13 Q I think you jumped ahead a little bit into
14 maybe your opinion of why there might be a first
15 image frame there, but I guess my question is a
16 little bit more basic, which was: How is a closed
17 GOP flag just an indication of an image frame,
18 right?

19 Because that's the first part of the
20 language of the limitation is there's got to be an
21 indication of an image frame, and then that
22 indication -- then that image frame has to be the

1 first frame. But I guess my question is more
2 basic as to how is the closed GOP flag an
3 indication of an image frame?

4 MR. KENDRICK: Object to the form.

5 BY THE WITNESS:

6 A Well, it is the indication when we
7 contemplate the decode -- excuse me, the encoder
8 that always produces a GOP that is a closed GOP
9 that begins with an I-frame. And that practice of
10 doing that is specifically called out and taught
11 explicitly in MPEG-1.

12 BY MR. UDICK:

13 Q So if that is an indication in MPEG-1 of
14 why it is the -- an indication of image frame,
15 what is the purpose for the picture start code
16 requirement in the GOP header that points to an
17 image frame?

18 A Sorry. Can you point me to where in the
19 MPEG-1 you're referring to the picture start code?

20 Q Sure.

21 If you turn to Page 37 of the MPEG-1
22 standard.

1 A I'm sorry. 37 as numbered by the pseudo
2 Bates numbering or as numbered by the standard?

3 Q 37 by the pseudo Bates numbering that is
4 also conveniently the PDF number.

5 A Got you. So 2.4.2.4?

6 Q Yep.

7 A Okay. And you said the picture start
8 code?

9 Q Right. And you see that "if" and "while"
10 loops, right?

11 A I do. So I see the group start code, time
12 code, closed GOP flag, broken link flag.

13 Q And at the very bottom, do you see the "do
14 while" -- "do picture while nextbits is equivalent
15 to picture start code"?

16 A I do see that.

17 Q And what -- how do you interpret that?

18 MR. KENDRICK: Object to the form.

19 BY THE WITNESS:

20 A Well, I interpret it and -- I haven't read
21 this for a while, so not going to try to remember
22 what I thought about it a year ago; I'm going to

1 just look at it right now and read it.

2 But this table is the syntax for the group
3 pictures in the bitstream. And so the header of
4 the group of pictures gets decoded, and then the
5 pictures themselves that are in the group get
6 decoded, and that "do" loop at the bottom is
7 actually looping through the pictures and decoding
8 them.

9 BY MR. UDICK:

10 Q Where does the closed GOP point to any
11 image frame?

12 MR. KENDRICK: Object to the form.

13 BY THE WITNESS:

14 A Well, I don't think it's required to point
15 to anything; it's only required to indicate.

16 BY MR. UDICK:

17 Q So how does it indicate at least one image
18 frame?

19 A It indicates at least one image frame as
20 follows: When the encoder practices MPEG-1 in a
21 way that implies every single group of pictures
22 will be a closed GOP and will start with an

1 I-frame, which is allowable and taught explicitly
2 in the standard, then a decoder, upon decoding a
3 closed GOP flag, knows that the next picture is an
4 I-picture that starts the GOP, the closed GOP, and
5 so that indicates.

6 You used the word "point," and, you know,
7 I think of "point" in a CS way, that it should
8 have an address or something, and I don't see that
9 in the claim; It just has to indicate.

10 And so in this mode of operation where the
11 encoder is known to only produce closed GOPs that
12 start with an I-frame, which we call exemplar
13 closed GOPs in the petition -- which, okay, I
14 haven't really read the petition, but I'm advised
15 by attorneys that they took that from my
16 declaration. And that, you know, in the
17 declaration as well they call it -- I call it an
18 exemplary closed GOP.

19 And so when we understand that the decoder
20 only produces this kind of GOP, then any decoder
21 that sees, upon decoding the bitstream, that it
22 has decoded a closed GOP flag, it immediately

1 knows that the next picture is an I-picture, and
2 that's an indication of that picture.

3 And I understand that you may disagree,
4 but that's my opinion.

5 Q So, yeah, totally get it. I'm just kind
6 of unpacking a little bit.

7 So if we have a different scenario where
8 we have encoders that produce open and closed
9 GOPs, right --

10 A Sure.

11 Q -- that closed GOP flag will still exist
12 in the header, correct?

13 A Absolutely correct.

14 Q And it will still indicate that there are
15 frames in that group of pictures, right?

16 MR. KENDRICK: Object to the form.

17 BY THE WITNESS:

18 A You know, in the sense that it is an
19 element -- required element of GOP header, sure;
20 it indicates that there's a group of pictures to
21 follow.

22

1 BY MR. UDICK:

2 Q But I guess that's where I'm confused.
3 Whether whatever is within that group of pictures,
4 doesn't that closed GOP flag still indicate the
5 same existence of some number of pictures within
6 the group?

7 MR. KENDRICK: Object to the form.

8 BY THE WITNESS:

9 A I say no. And I further state that this
10 is -- this is the point where our train tracks
11 don't quite meet because, in my opinion, if there
12 is a teaching in MPEG-1 that teaches this closed
13 GOP flag to indicate a frame, the I-frame, then it
14 teaches it, and that is enough to disclose the
15 limitation, to render obvious the limitation or
16 the piece of the limitation, in my opinion.

17 And I think that I understand your opinion
18 to be: But if MPEG also teaches other things that
19 you can do that might make that different, that it
20 isn't obvious then.

21 So I think we have to gentlemanly agree to
22 disagree on that, but my opinion is that MPEG-1

1 teaches that the encoder can operate in this way,
2 such that after -- I'm sorry -- that every GOP is
3 closed and every GOP begins with an I-frame.

4 And under that operational scenario, the
5 closed GOP flag may be reliably taken as an
6 indication of -- what's the language exactly? --
7 at least one frame -- as an indication of at least
8 one image frame, which is the first image frame in
9 decoding order of an independent sequence.

10 Yes, under my scenario that I just
11 articulated, where the encoder is operating it
12 this way, which is taught by MPEG-1, then that
13 closed GOP flag is, it indicates, the first frame,
14 as recited in this piece of the claim limitation.

15 Your point is also well taken, in my
16 opinion, that MPEG teaches other ways to operate.
17 And I don't dispute that; you're right.

18 Q And I guess maybe it's a little -- I mean,
19 I think you've hit the nail on the head of one of
20 our fundamental disagreements, but I'm still stuck
21 a little bit on not the indicating that the image
22 frame is the first image frame, but simply

1 indicating one -- at least one image frame, right?

2 Because those things have to be true.

3 MR. KENDRICK: Object to the form.

4 THE WITNESS: Sorry for not pausing.

5 BY THE WITNESS:

6 A I hear you. In my opinion, the GOP header
7 has a known structure. The closed GOP flag has a
8 known position in that structure, and it is known
9 to every decoder that what follows that GOP header
10 is the pictures of the GOP.

11 So every time that you see the closed GOP
12 flag, it indicates that there is an I-frame
13 coming, which is the first one. And so in that
14 sense, it indicates. And, to me, in my opinion,
15 what a -- you know, putting on the shoes of a
16 POSITA, when I read this, I believe that the
17 POSITA understands that this is a -- not only
18 allowable, but explicitly called-out way that the
19 encoder can operate, and when it does so, then it
20 indicates. That closed GOP flag indicates that
21 the next picture is the I-frame that begins the
22 GOP. And that it's a closed GOP so that --

1 Q You and maybe -- maybe just a small
2 clarification. It's not the mere existence of the
3 closed GOP flag that indicates that to you, right?
4 It's that it's set to a certain value, correct?

5 A Oh, you're correct. Yeah. It has to be
6 1. But in our scenario, it is always 1. In my --
7 in the encoder and decoder that I'm, you know,
8 relying on, it's always 1 --

9 Q And --

10 A -- GOP is a closed GOP that begins with an
11 I-frame.

12 Q And you're referring -- you're relying on
13 a -- you said an encoder and a decoder, but it's
14 really just an encoder, right? Because the
15 encoder's what constructs the bitstream, correct?

16 MR. KENDRICK: Object to the form.

17 BY THE WITNESS:

18 A That's true, the encoder produced the
19 bitstream and then the decoder decodes it.

20 BY MR. UDICK:

21 Q Because the decoder -- frankly, an
22 MPEG-1-compliant decoder doesn't care if

1 the -- you know, the encoder that you've selected
2 does all closed -- only closed GOPs, right?

3 MR. KENDRICK: Same objection.

4 BY THE WITNESS:

5 A Well, I don't think you can say that. And
6 the reason I think that I don't think you can say
7 that is because, again, there's a lot in MPEG-1,
8 and there's parts of it that are optional.

9 So it's always going to be the case that
10 the encoder and decoder have to agree on how
11 MPEG's going to be practiced.

12 BY MR. UDICK:

13 Q Sure.

14 A And if you have an encoder that's
15 practicing some optional parts that aren't
16 supported by the decoder, then it ain't going to
17 work -- I'm sorry to use a colloquialism -- it's
18 not going to work.

19 So there has to be an agreement between
20 the encoder and decoder on what -- how this is --
21 MPEG-1 is going to be practiced. And, again, the
22 way that I -- what the -- sorry for speaking

1 poorly.

2 The construction that I am relying upon to
3 form my opinion is one wherein the encoder and
4 decoder both understand that we're not going to
5 practice open GOPs and we're not going to practice
6 closed GOPs that begin with B-pictures; we're only
7 going to practice closed GOPs that begin with
8 I-picture.

9 And they have to both understand that.
10 But this is allowed by the standard very clearly,
11 and so when that occurs, then, yes, the closed GOP
12 flag is the indicator -- rephrase. The closed GOP
13 flag may be read and interpreted as an indication.
14 It indicates that the next frame is the I-frame,
15 which is the first frame in bitstream order and
16 decoding order of the closed GOP.

17 BY MR. UDICK:

18 Q And so is it -- when you say that the
19 encoder and the decoder are not going to practice
20 open GOPs or closed GOPs that begin with
21 B-pictures, are you saying that the one you have
22 in mind, the one that's the subject of your

1 opinion, is an MPEG-1 decoder but limited to only
2 handle closed GOPs without B-pictures that
3 begin ; is that -- do I understand that
4 correctly?

5 A Yes, sir.

6 Q Okay.

7 A And I apologize if I didn't clearly
8 articulate that in my writing quality, but that is
9 certainly what I meant.

10 Q Right. Because you understand the
11 difference where I'm at is that an MPEG-1 encoder
12 may choose to do all the things you say, right?

13 A It can. Absolutely it can; you're right.

14 Q But the disclosed decoder of MPEG-1
15 handles every required aspect of the MPEG-1
16 standard, right?

17 MR. KENDRICK: Object to the form.

18 BY THE WITNESS:

19 A I mean, to the extent that you say what
20 "required" means because -- nowhere in MPEG does
21 it say you have to have any B-frames at all. It
22 doesn't even say you have to have P-frames;

1 they're not required.

2 BY MR. UDICK:

3 Q They're not required to be used, but an
4 MPEG-1 decoding -- an MPEG-1-compliant decoder
5 would be required to handle them, correct?

6 MR. KENDRICK: Same objection.

7 BY THE WITNESS:

8 A Strictly speaking, you're correct.

9 Now, companies do market them and say it's
10 compliant, and nobody takes issue with it even
11 though they don't support everything. And, also,
12 you know, you can be -- like, I mean, I don't want
13 to take our time to look at the top of the
14 standard, but I will if you say do it, but there's
15 a word, there's a phrase that refers to a decoder
16 that only supports certain ranges of the values.
17 And that's explicit in MPEG-1.

18 And so, you know, you can say, well, I
19 have a compliant decoder, but it only handles the
20 constrained parameters. I think that's what it's
21 called constrained parameter set. So it's a
22 little bit fuzzy what compliant means.

1 All of that said, I will agree with you
2 that in a strict sense, when you say I've got an
3 MPEG-1-compliant decoder, it needs to be able to
4 decode B-frames, and it needs to be able to decode
5 a group of pictures that starts with a B-frame,
6 and it needs to be able to decode a group of
7 pictures that is open. "Open" meaning not closed.
8 That's all true. But it's perfectly legal in
9 MPEG-1 to not use any of that. You can practice
10 MPEG-1 and not use any of that.

11 So the encoder and decoder that goes with
12 it that I'm relying on always produce -- the
13 encoder produces closed GOPs that start with
14 I-frames, and the decoder knows this, and so it
15 knows that when it sees a closed GOP flag, the
16 next thing is the I-frame that begins the GOP both
17 in decoding order and -- you know, decoding order
18 is the same as bitstream order and display.

19 (Reporter clarification.)

20 BY MR. UDICK:

21 Q Now, you've got me a little curious. If
22 you have an encoder and decoder designed that way,

1 why would you need a closed GOP flag at all?

2 MR. KENDRICK: Object to the form.

3 BY THE WITNESS:

4 A The simple answer is because MPEG-1 says
5 you have to have it. But if you want a slightly
6 more, sort of, erudite answer, I guess I would say
7 that it could be that we practice that way when we
8 send a certain --

9 (WHEREUPON, technical issues were resolved
10 off the record.)

11 BY THE WITNESS:

12 A So I'm back on record continuing my answer
13 to the previous question, which was just
14 articulated to me by Counsel, and I am -- have
15 been given the question and the partial answer
16 before the technology problem occurred.

17 So I'm continuing my answer right from
18 that point. And what I was saying is, the
19 question is why do you even need a closed GOP flag
20 if you're going to practice in a mode where every
21 GOP is closed, and, moreover, it begins with an
22 I-frame.

1 And so the answer is that, well, number
2 one, MPEG says you have to have it, but, you know,
3 if you want to have really a technical reason
4 that, you know, makes more sense than that from
5 the practical standpoint, you know, the encoder
6 and decoder may operate in multiple modes.

7 It may be that I connect -- I'll leave
8 everybody involved out of it and say that, you
9 know, that I connect to my Cox cable network at
10 home and I'm operating in one mode to receive a TV
11 stream from them.

12 And then I go, and because I also have
13 AT&T fiber at home, I can connect -- they give me
14 a Max subscription, so maybe I connect there, and
15 maybe these two connections have different
16 operational requirements.

17 And so it may be that my decoder -- and if
18 it was a two-way -- the ones I mentioned are one
19 way, but if it was a two-way communication, then I
20 might have my encoder as well locally. They might
21 operate in different modes at different times.

22 But I will conclude this long-winded

1 interrupted answer by saying that, whatever the
2 case is, it has to be agreed between the encoder
3 and decoder how you're going to operate.

4 And, so, for example, if the decoder is
5 going to practice only -- is capable of practicing
6 only constrained parameters, then the encoder
7 needs to know that and practice that way as well.

8 BY MR. UDICK:

9 Q So I think that we've talked over the
10 closed GOP opinion you have. Let's move over to
11 the temporal reference opinion.

12 So that uses the temporal reference, which
13 is a bit in the picture header that defines the
14 display order to the decoder; is that correct?

15 MR. KENDRICK: Object to the form.

16 BY THE WITNESS:

17 A Almost. 10 bits.

18 BY MR. UDICK:

19 Q 10 bits. Sorry. Yes.

20 A So otherwise I agree with what you said.

21 Q And there -- and that also requires --
22 your opinion also requires the encoder and decoder

1 designed in the way you previously mentioned, only
2 closed GOPs and no B-frames in the beginning; is
3 that correct?

4 A And one more.

5 Q Right.

6 A You can't have more than two to the tenth
7 frames in GOP because then the number would roll
8 over to a zero again.

9 Q Right. Because you can only index to 1024
10 under MPEG-1; is that correct?

11 A That's exactly it.

12 I mean, so let me just say, you know, in
13 MPEG-1, most general operation, it's allowed to
14 roll over. You can have 10,000 frames, and that
15 number just keeps rolling over, but you'll never
16 have two of them with the same number that would
17 be a round being used as referenced at the same
18 time, so in that mode of operation, it's not
19 problematic.

20 Q You would agree, though, that in -- and
21 you understand, kind of, the patent owner's
22 position that in other scenarios where it's not a

1 closed GOP or where B-frames proceed, the zero is
2 a mismatch because a B-frame might take the zero
3 and be the first image frame in that display
4 order; is that correct?

5 MR. KENDRICK: Object to the form.

6 BY MR. UDICK:

7 Q Or let me just completely restate that
8 one.

9 You understand that patent owner's
10 position is that would not be an indication of the
11 first image frame because the temporal reference
12 of a B-frame in a closed GOP could take that zero
13 and, therefore, it would not indicate a first
14 image frame in display order; is that right?

15 MR. KENDRICK: Same objection.

16 BY THE WITNESS:

17 A Well, it would -- it would indicate the
18 first frame in display order, but it wouldn't be
19 the I-frame, that's the point.

20 And, yes, I agree that it's allowable to
21 operate that way within standard. It is.
22 Absolutely.

1 BY MR. UDICK:

2 Q Moving to 8[b], you have a -- you have a
3 sentence. So if we go to Paragraph 100 of your
4 declaration.

5 Let me know when you're there.

6 A Because we switched computers, I've got to
7 scroll through it again.

8 Q It is --

9 A I got it. I'm sorry to interrupt you. I
10 am at Paragraph 100.

11 Q No worries.

12 So here you note that, "If playback begins
13 from a random point in the bitstream, the decoder
14 should discard all of the bits until it finds a
15 sequence start code, a group of pictures start
16 code, or a picture start code which introduces an
17 I-picture," right?

18 A Correct. And that's a quote out of the
19 standard.

20 Q Right. So let's keep that in mind. And
21 if you'll go to the standard and go to PDF Page 71
22 under the D.2.3 "Bitstream Hierarchy."

1 A Sorry. Could you repeat the number?

2 Q It is PDF and the, kind of, pseudo Bates
3 number Page 71 of --

4 A I'm on that page. I don't see that number
5 you're referring to -- oh, D.2.3 at the top.

6 Q Yes, sir.

7 A I am there.

8 Q Great.

9 And let's look at either -- let's look at
10 Figure D.3 and D.4. Both of those -- it's
11 essentially the same sequence but one in display
12 order and one in bitstream order, right?

13 A Yes.

14 Q So if we have playback begin at the I12
15 frame of D.3 or 4 -- do you see where I'm at?

16 A I do.

17 Q Under MPEG-1 and this portion you cite, it
18 will discard all bits until it finds a sequence
19 start code, a group of pictures start code, or a
20 picture start code which introduces an I-picture,
21 right?

22 A I agree.

1 Q And so what would it -- what would it
2 process first in D.4, or D.3, I guess?

3 MR. KENDRICK: Object to the form.

4 BY THE WITNESS:

5 A So let me make sure I understand. You're
6 saying that something happened, maybe a -- I'm
7 adding to your question, okay, to make sure I
8 understand it.

9 BY MR. UDICK:

10 Q Sure.

11 A Maybe I changed channels. Maybe we're
12 watching streaming TV and I changed my channel.
13 Or I took a web browser and plugged into a live
14 broadcast of something, and I just happen to start
15 on that frame 12, right? That's what you're
16 saying, I12?

17 Q Correct.

18 A Well, because the I12, if you
19 started -- you know, let's just say as a friendly
20 amendment to your question that we don't start
21 exactly at I12 but maybe a little bit before.
22 Like, we're a few bits on B11, but then we hit and

1 recognize the beginning of I12 at the decoder, and
2 it's going to see that picture start code and it's
3 going to start decoding; you're correct.

4 Q Will it have -- will it have decoded a
5 closed GOP flag?

6 MR. KENDRICK: Object to the form.

7 BY THE WITNESS:

8 A I'm going to have to look at it for a
9 minute to determine if the sequence that's shown
10 in the figure is supposed to be one GOP or might
11 be multiple GOPs to answer that.

12 BY MR. UDICK:

13 Q Okay.

14 A So my answer is that, in reading the text
15 that surround Figure D.3 and Figure D.4, I'm
16 unable to determine if that's meant to say that
17 that's a single GOP. It would be legal within
18 MPEG for that to be a single GOP. It doesn't tell
19 us whether that is or not.

20 So my answer is that if an I-frame I12 is
21 the start of a new GOP, well, there's going to be
22 a GOP header there; but if it's not, which is also

1 legal, then there won't be.

2 So whether -- so it is conceivable,
3 possible, and allowable that there would not be a
4 closed GOP flag there. It's also conceivable and
5 allowable that there would be.

6 It just depends if that sequence -- if
7 that sequence is a single GOP or if it's multiple
8 GOPs. And it could be either one.

9 Q Right.

10 THE WITNESS: I just disappeared. There
11 was an "your internet is unstable."

12 BY MR. UDICK:

13 Q And if that previous image was a single
14 GOP -- it was a single closed GOP, the temporal
15 reference of that I-frame would not be zero,
16 right?

17 A Yeah, I think you mean the sequence shown
18 in Figure D.3.

19 Q Yes, if that sequence was a single GOP --
20 a single closed GOP, the temporal reference of the
21 I-frame that we talked about would not be zero; is
22 that --

1 A Right -- sorry I talked on top of you.

2 You are correct, I12, the one you're
3 referring to in Figure D.3 -- it's also labeled
4 I12 in Figure D.4 -- would have a temporal
5 reference other than zero, yes.

6 In fact, it would have a temporal
7 reference of 12.

8 Q Right.

9 MR. UDICK: All right. Let's take a quick
10 break just to make sure I don't have anything and
11 we may pass over or be done.

12 MR. KENDRICK: Great. You thinking five
13 minutes, Steve?

14 MR. UDICK: Yeah.

15 THE WITNESS: Very well. Thank you.

16 (WHEREUPON, a recess was had.)

17 MR. UDICK: Pending any redirect, we pass
18 the witness.

19 MR. KENDRICK: Thanks, Steve.

20 No questions from me, so I think we're
21 done here.

22 MR. UDICK: Great.

1 (WHEREUPON, the deposition was concluded
2 at 2:32 p.m. CST)
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ACKNOWLEDGMENT OF DEPONENT

I, DR. JOSEPH P. HAVLICEK, do hereby
acknowledge that I have read and examined the
foregoing testimony and the same is a true,
correct, and complete transcription of the
testimony given by me and any corrections appear
on the attached errata sheet signed by me.

(SIGNATURE)

(DATE)

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I, MICHELLE M. YOHLER, a Certified
Shorthand Reporter within and for the County of
Will, State of Illinois, do hereby certify:

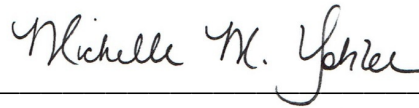
That previous to the commencement of the
examination of the witness, the witness was duly
sworn to testify the whole truth concerning the
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That the foregoing deposition transcript
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such attorney or counsel for any of the parties
hereto, nor interested directly or indirectly in
the outcome of this action.

1 IN WITNESS WHEREOF, I do hereunto set my
2 hand and affix my seal of office at Chicago,
3 Illinois, this 6th day of December, 2024.

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8
9 Michelle M. Yohler, CSR, RMR, CRR
10 Certified Shorthand Reporter
11 CSR No.: 84-4531

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