

**UNITED STATES PATENT AND TRADEMARK OFFICE**

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**BEFORE THE PATENT TRIAL AND APPEAL BOARD**

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SNAP INC. and HISENSE USA CORPORATION,

Petitioners

v.

NOKIA TECHNOLOGIES OY,

Patent Owner

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Case: IPR2025-01014  
U.S. Patent No. 8,050,321

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**PATENT OWNER'S PRELIMINARY RESPONSE**

***Mail Stop "PATENT BOARD"***

Patent Trial and Appeal Board  
U.S. Patent and Trademark Office  
P.O. Box 1450  
Alexandria, VA 22313-1450

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| <b>2005</b>    | Respondents’ Exhibit B-5 Claim Chart (U. S. Patent No. 6,912,351 (“Kim”) in Investigation No. 337-TA-1448, dated July 1, 2025                                                                     | <b>X</b>                    |
| <b>2006</b>    | Respondents’ Exhibit B-14 Claim Chart (U.S. Patent Publication No. 2001/0048805A1 (“Adolph”), dated August 8, 2025                                                                                | <b>X</b>                    |
| <b>2007</b>    | Respondents Joint Disclosure of Initial Invalidity Contentions in Response to Individual Interrogatory Nos. 10-12 in Investigation No. 337-TA-1380, dated February 15, 2024                       | <b>X</b>                    |
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| <b>2011</b>    | Complaint Under Section 337 of the Tariff Act of 1930, As Amended, in Investigation No. 337-TA-1448, dated June 25, 2025                                                                          | <b>X</b>                    |
| <b>2012</b>    | Declaration of Dr. Iain Richardson (“Richardson Decl.”)                                                                                                                                           |                             |
| <b>2013</b>    | <i>Certain Video Capable Electronic Devices, Including Computers, Streaming Devices, Televisions, and Components and Modules Thereof</i> , Investigation No. 337-                                 |                             |

| Ex. No. | Title                                                                                                                 | Previously Submitted |
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## I. INTRODUCTION

The Board should deny institution because Petitioners fail to show a reasonable likelihood that any of claims 1-11 (“Challenged Claims”) of U.S. Patent No. 8,050,321 (“the ’321 Patent”) are obvious.

The ’321 Patent is directed to novel data structures and techniques that enable a user to watch a streaming video from a random user-selected point in the stream, which is sometimes called “random access.” The ’321 Patent provides random access of streaming video with more efficiency and fewer errors than conventional technology at the time.

Both grounds of the Petition rely on a primary reference, Kim, which is not about random access or streaming video, but is instead about storing time lapse intermittent images on an optical disk to improve durability over traditional magnetic storage. Kim fails to disclose or render obvious numerous elements of the Challenged Claims. Most significantly, Kim does not disclose or render obvious either encoding or decoding the required “*indication* of at least one image frame, which is the *first image frame, in decoding order*, of the independent sequence.” ’321 Patent, cls. 1-7 (encoding), 8-11 (decoding). This is not surprising given that Kim does not discuss independently decodable video sequences anywhere in its disclosure but instead emphasizes the problem of decoding *individual image frames* that are intermittently stored in the bitstream. The Petitioners rely on an optional

value that Kim describes may be “zero” or entirely “absent” from the bitstream because it serves no purpose at all. Both the Petition and Petitioners’ expert, Dr. Havlicek, cite the same disclosures in Kim that show this optional value is never ascribed any meaning and is never used by either the encoder or decoder as an indication of anything, which is why it is allowed to be entirely absent from the bitstream. The mere fact that a zero value may sometimes be present in an image that may sometimes be the first image frame in decoding order does not mean that the zero value *indicates* the first image frame in decoding order, as the claims require. Indeed, the fact that a zero value may also be present in an image that is *not* the first image frame in decoding order proves that the zero value cannot be the claimed “*indication* of at least one image frame, which is the *first image frame, in decoding order*, of the independent sequence.” The Petition does not present any theories on how or why a person of ordinary skill would have modified Kim to overcome this deficiency or render obvious this limitation.

Additionally, Kim does not disclose or render obvious the *decoder* resetting the identifier value for the indicated first image frame of the independent sequence (claims 8-11). This is because Kim at best only describes resetting values at the *encoder*. The Petition’s rationale for modifying Kim in this regard directly contradicts how both the Petition and Dr. Havlicek describe Kim’s operation, and

even as modified, still fails to render obvious this limitation. For this additional reason, Kim fails to disclose or render obvious the challenged decoding claims 8-11.

Notably, the patentability of the '321 Patent in view of Kim has already been adjudicated in an ITC proceeding in 2024. There, the ALJ determined that the same Kim reference, asserted here by the same counsel representing Petitioners, did not anticipate or render obvious any of the asserted decoding claims of the '321 Patent. Ex. 2003, 56-57. While the encoding claims were not at issue in that ITC proceeding, Petitioners' theories for how Kim allegedly discloses or renders obvious the encoding claims are substantially the same as for the decoding claims.

Although the Board has instituted an IPR on the '321 Patent in the past (IPR2024-00691), that petition differed materially from the Petition at issue here, and the Board did not at that time have the benefit of the evidence, testimony, and findings in the related ITC Investigation that show the Challenged Claims are valid over Kim. This response also focuses on specific admissions by Dr. Havlicek that were not focused on in the prior IPR.

Therefore, for the reasons explained herein, Nokia requests the Board find all the Challenged Claims not unpatentable, just as the ALJ did for the decoding claims challenged here.

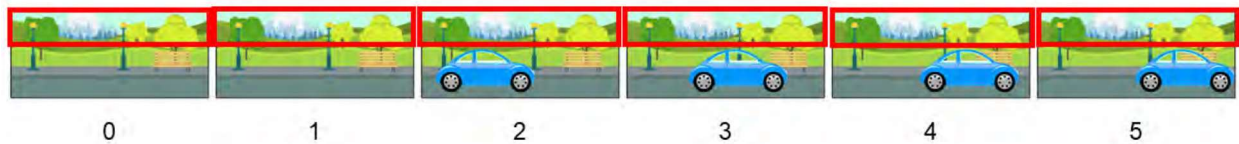
## **II. BACKGROUND**

### **A. Technical Background**

The '321 Patent relates to improvements to video encoders and decoders, which enables a decoder to identify where to start a decoding process, while minimizing errors and optimizing efficiency. This is particularly important for situations when a user wishes to select a particular point (other than the beginning) to start watching a video, for example when joining a stream part-way through or when skipping ahead or returning to a past point in the video. In video coding, this is known as random access, and the '321 Patent is directed to improving random access. '321 Patent, 3:52-56, 3:62-4:4, 4:48-60.

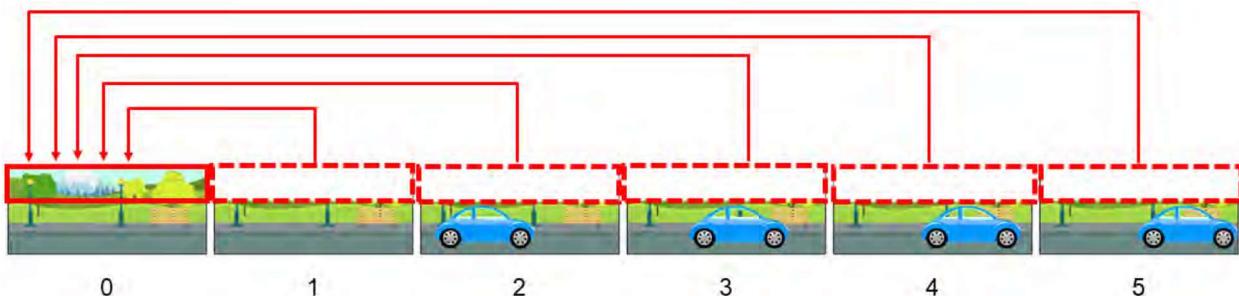
Minimizing bitrate is extremely important for applications such as video streaming, and various techniques have been developed to improve video compression (video encoding), such as techniques that take advantage of spatial redundancy (similarities between areas within a video frame known as intra-frame techniques) and temporal redundancy (similarities between successive video frames known as inter-frame techniques). As the '321 Patent notes, “[t]o reduce the amount of data in video files, the image data can be compressed into a smaller form by reducing the amount of redundant information in the image frames.” '321 Patent, 2:5-7.

One such inter-frame technique, known as motion-compensated temporal prediction, can be used to take advantage of the redundancy of successive image frames. '321 Patent, 2:15-17.



Ex. 2012 (Richardson Decl.), ¶ 49 (annotating in red the redundancy in successive image frames).

In this method, a portion of a current frame to be encoded can be predicted from a portion in another, previously-encoded frame such as a past or future frame in display order. Motion-compensated temporal prediction attempts to identify a matching portion in a previously coded frame, which may be in a different position due to movement or motion of objects or areas, and to use this to predict a portion of a current frame. '321 Patent, 2:16-20.



Richardson Decl., ¶ 51 (annotating in red how successive image frames can reuse the redundant portion of the previous frame rather than re-encode that portion of the image).

I-frames (or INTRA-frames) are encoded frames whose encoded image information is not determined using this motion-compensated temporal prediction process, while INTER-frames (also known as P-frames or B-frames) are encoded frames whose image information is, at least in part, determined based on prediction from one or more previously coded frames in the sequence. In the example shown above, the 0 frame is an I-frame, and the other frames 1-5 are P-frames. Such previously coded frames may be preceding frames in display order and/or subsequent frames in display order. A P-frame is encoded using only one previously encoded frame and a B-frame may be encoded using two previously-encoded frames, for example one preceding frame and one subsequent frame in display order. '321 Patent, 2:20-32, 2:42-47.

While the use of INTER-frames, such as P-frames or predicted frames, improves coding efficiency, one problem that the '321 Patent describes is that “[i]f a frame is lost, frames dependent on it can no longer be correctly decoded.” '321 Patent, 2:31-33. The '321 Patent describes that, in conventional systems, image “frames are typically numbered according to an arithmetical series,” so that the decoder can know if a frame is missing based on a discontinuity in the frame

numbering. '321 Patent, 3:19-20, 11:20-25. However, in conventional systems, the decoder had no way of knowing whether lost or missing frames were needed for further decoding or whether they could be ignored. '321 Patent, 11:22-25, 3:3-20.

One situation where this was a problem is “when the user wishes to start browsing a video file in the middle of a video sequence. Such situations occur for example when the user wishes to browse a locally stored video file backward or forward or to browse a streaming file at a particular point; when the user initiates the playback of a streaming file from a random point; or when a video file that is to be reproduced is detected to contain an error that interrupts the playback or requires the playback to be resumed from a point following the error. When the browsing of a video file is resumed from a random point after previous browsing, discontinuity typically occurs in the image numbering. The decoder typically interprets this as unintentional loss of image frames and unnecessarily tries to reconstruct the image frames suspected as lost.” '321 Patent, 11:11-25.

“Another example relates to starting the reception of a broadcast or multicast video transmission from the middle of the video transmission. A third example relates to on-demand streaming from a server and occurs when an end-user wishes to start playback from a certain position of a stream.” '321 Patent, 3:66-4:5.

Thus, the inventor the '321 Patent recognized that there was a need for an “improved method and equipment implementing the method, that enable detection

of image frames from which a decoder can start the decoding process” without having to worry about whether the missing frames are needed for decoding later frames. ’321 Patent, 4:8-30; Richardson Decl., ¶ 59. That is, it is important to be capable of identifying a coded video frame (picture) from which it is guaranteed that a decoder can begin decoding independently, for example to enable playback from or seeking to start at a particular position in a coded video stream (random access). Richardson Decl., ¶ 59.

## **B. The ’321 Patent**

The ’321 Patent claims an improved method “that enable[s] detection of image frames from which a decoder can start the decoding process.” ’321 Patent, 4:8-10. The inventor of the ’321 Patent recognized that the problems with conventional systems “can be avoided in the decoder by defining an initiation image in an independently decodable Group of Pictures GOP that is activated at the random point of the video file, and the number of the initiation image is set at zero.” ’321 Patent, 11:26-30.

“The invention is based on the idea of encoding a video sequence comprising an *independent* sequence of image frames, wherein at least one reference picture is predictable from at least one previous image frame that is earlier than the previous reference image frame in decoding order.” ’321 Patent, 4:16-20 (emphasis added). At the encoder, “identifier values for pictures are encoded according to a numbering

scheme, and the identifier value for the indicated first picture of an independent sequence is reset, preferably to zero.” ’321 Patent, 4:42-45. To that end, the ’321 Patent claims a method of encoding comprising “encoding into the video sequence an *indication* of at least one image frame, which is *the first image frame, in decoding order*, of the independent sequence; encoding identifier values for the image frames according to a numbering scheme; and resetting the identifier value for the indicated first image frame of the independent sequence.” ’321 Patent, claim 1 (emphasis added).

The idea behind the ’321 Patent’s invention was to be able to identify during later *decoding* of a bitstream an initiation picture among a series of pictures in an independently decodable sequence to begin decoding the bitstream from that picture; and thus, during the decoding process, any picture before the initiation picture is discarded, by being defined as unusable as a reference picture. *See* ’321 Patent, 4:31-35. “Consequently, when activated at a random point, the decoder preferably sets the identifier of the first image frame, preferably an I-frame, of the independently decodable sub-sequence at zero.” ’321 Patent, 11:26-40. To that end, the ’321 Patent claims a method of decoding comprising “decoding from the video sequence an *indication* of at least one image frame, which is *the first image frame, in decoding order*, of an independent sequence, wherein all motion-compensated temporal prediction references of the independent sequence refer only to image frames within

said independent sequence; *starting the decoding of the video sequence from said first image frame* of the independent sequence, whereby the video sequence is decoded without prediction from any image frame decoded prior to said first image frame; decoding identifier values for image frames according to a numbering scheme; *and resetting the identifier value for the indicated first image frame* of the independent sequence.” ’321 Patent, claim 8 (emphasis added).

### C. The Prior Art

#### 1. Kim (U.S. Patent No. 6,912,351)

Unlike the ’321 Patent, Kim is not related to streaming video or random access. Kim is directed to a Time Lapse recording/reproduction device and method. Ex. 1006 (Kim), 1:8-12. More specifically, Kim describes recording, compressing and reproducing intermittently recorded image data. In other words, Kim is about single images captured at intermittent time intervals. Richardson Decl., ¶¶ 60-62. Examples of where this type of technology is applied is in banks or other security-sensitive areas; in such implementations, pictures are recorded intermittently and then stored in a database. Ex. 1006 (Kim), 1:14-19. These *individual* images can be reproduced when needed. Ex. 1006 (Kim), 1:8-56; Richardson Decl., ¶¶ 60-62. Unlike streaming video in the ’321 Patent, Kim explains that “only the desired images can be selectively reproduced with high display quality.” Ex. 1006 (Kim), 6:17-20. In fact, Kim does not discuss independently decodable video sequences

anywhere in its disclosure. This makes sense given Kim's emphasis on intermittently stored *individual image frames*. Ex. 1006 (Kim), 1:38-45.

Kim was concerned that conventional Time Lapse Video Cassette Recorders used magnetic tapes for storage, which resulted in "considerable use and wear" which ultimately deteriorated the quality of the images. Ex. 1006 (Kim), 1:57-67. Thus, Kim suggested using an optical disk instead. Ex. 1006 (Kim), 2:58-61. Kim's problem and suggested solution therefore are completely unrelated to the problems and solutions of the '321 Patent. Richardson Decl., ¶¶ 60-62.

Petitioners rely heavily on Figure 5A of Kim for nearly every element of every claim. *See, e.g.*, Pet., 13-20. Figure 5A shows a bitstream that includes both I-frames (images without prediction) and P-frames (images with prediction from previously stored images). Richardson Decl., ¶ 63. According to Kim's Figure 5A, each "P-picture frame P1, P2, P3 has a current address ("CAD") indicating the current address of the P-picture, and an I-picture reference address ("IAD") indicating the address of the corresponding (or previous) I-frame." Ex. 1006 (Kim), 4:46-52 (shown below).

The bit stream generated and transmitted to the recording/  
reproducing unit **140** as described above has a logical  
structure as shown in, e.g., FIG. **5A**. As shown therein, each  
P-picture frame **P1**, **P2**, **P3** has a current address CAD  
50 indicating the current address of the P-picture, and an  
I-picture reference address IAD indicating the address of the  
corresponding (or previous) I-frame. If image signals are

Richardson Decl., ¶ 63.

But while the IAD *of a P-frame* references the logical address of the corresponding or previous I-frame, the IAD *of an I-frame* is either “zero or absent” because it has no corresponding meaning at all. Ex. 1006 (Kim), 4:65-5:7; Richardson Decl., ¶¶ 64-68, 73-74. This is because the I-frame does not rely on prediction from any other frame and therefore it makes no sense for it to have an associated IAD with any meaning. Therefore, as will be discussed later in much more detail, the Petition is incorrect that the IAD of an I-frame can satisfy the claimed “*indication* of at least one image frame, which is *the first image frame, in decoding order*, of an independent sequence.” *See, e.g.,* Pet., 16-18.

Kim’s Figure 3 explains the encoding process and how the IAD of the I-frame has no corresponding meaning.

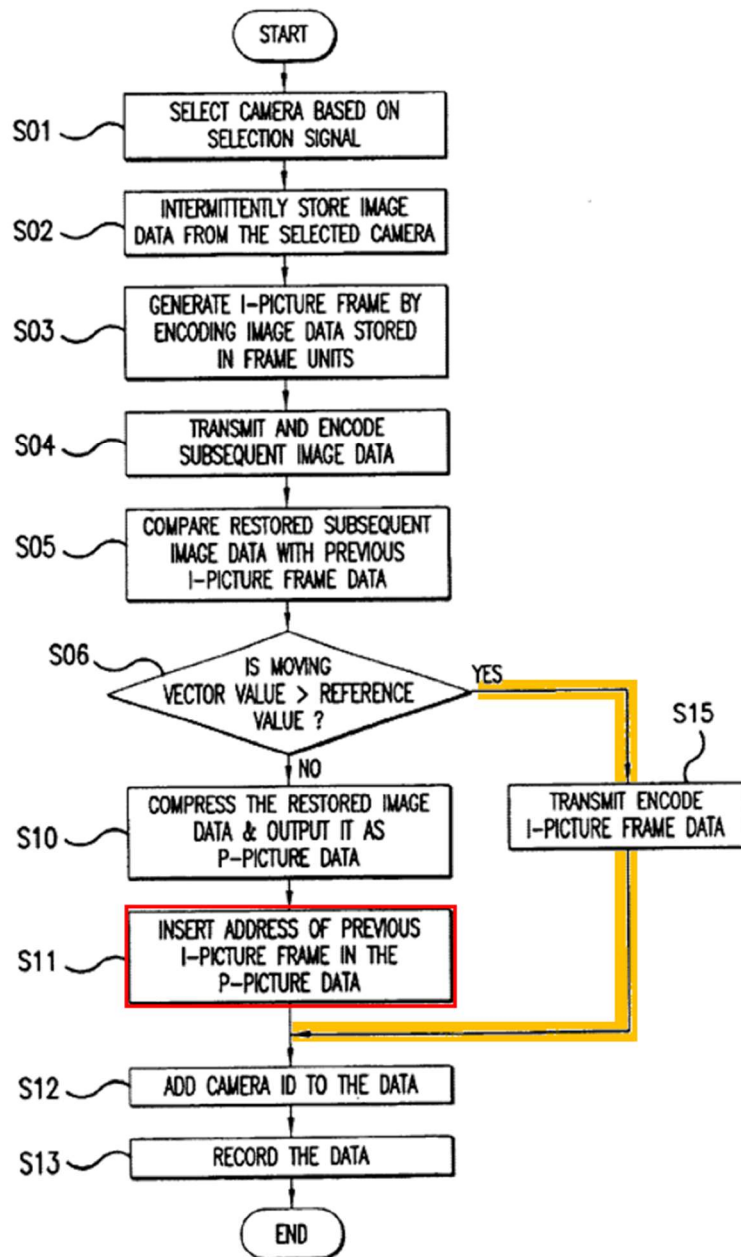


FIG.3

Richardson Decl., ¶ 65 (annotating Kim, Fig. 3).

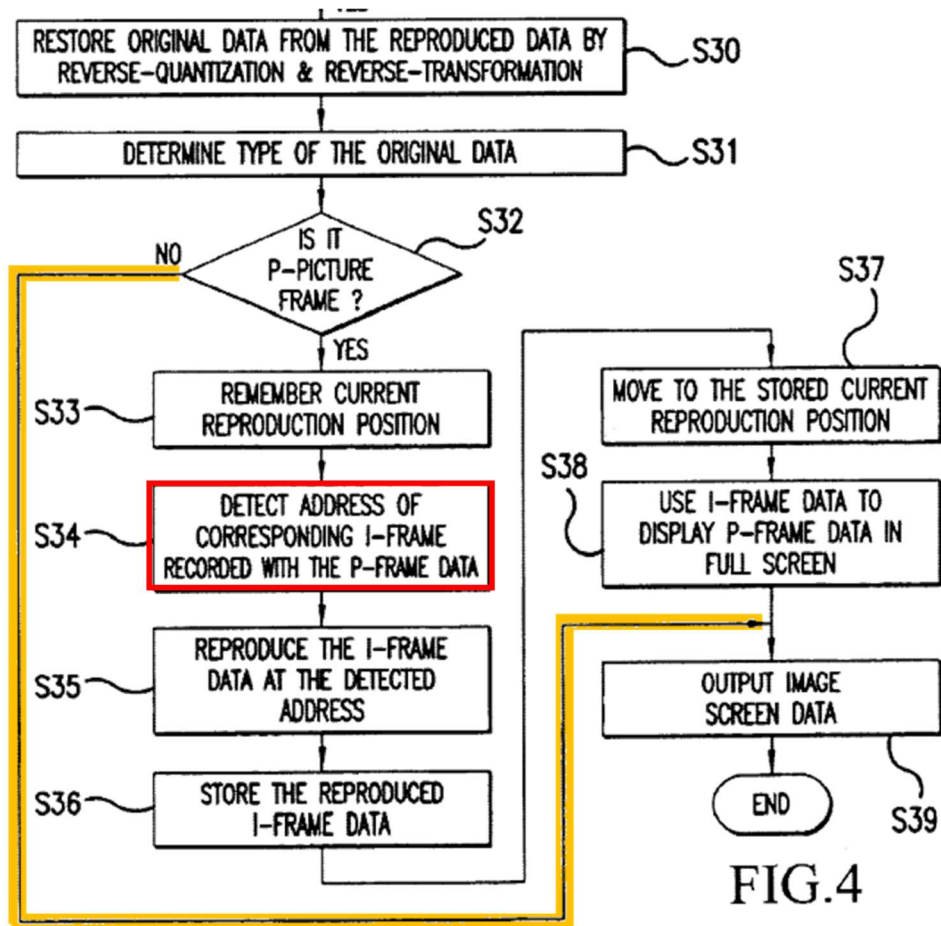
In particular, Kim explains how it encodes the first image as an I-frame, which does not depend on any other frame. Ex. 1006 (Kim), 3:57-65 (Step S03). For the

next image, Kim teaches that its encoder will determine whether that image frame's data is similar enough to the first image that it can use a P-frame to encode that (second) image frame. Ex. 1006 (Kim), 3:65-4:14 (Steps S04-S06). If Kim's encoder determines that the second image frame is similar enough to the first image frame, the encoder will encode the second image frame as a P-frame in Step S10 and then, in Step S11, the encoder will add "the moving vector and the position value of the corresponding (or previous) I-frame [IAD of the P-frame], so that the above information is added to the corresponding compressed P-frame output from the encoder." Ex. 1006 (Kim), 4:15-33.

Alternatively, if Kim's encoder determines that the second image frame is *not* similar enough to the first image frame (in Step S06), then the encoder will encode the second image frame as another I-frame (in Step S15). Ex. 1006 (Kim), 4:23-27. As shown in the annotated Figure 3 above, the process for encoding the second image frame as an I-frame (shown in orange) skips Step S11 (outlined in red): "insert address of previous I-picture frame in the P-picture data." Richardson Decl., ¶ 67. Critically, Kim's encoder therefore only adds "the position value of the corresponding (or previous) I-frame" [IAD] to the *P-frames*, and *not to the I-frames*. Ex. 1006 (Kim), 4:15-33. Richardson Decl., ¶ 67. For the I-frames, Kim instead teaches that "the address of the corresponding I-picture frame (3) is zero or absent." Ex. 1006 (Kim), 4:65-5:1. Thus, the IAD *of the I-frame* does not correspond to a

position value or any other meaning. Richardson Decl., ¶ 68. The IAD for the I-frame has no meaning or use, which is why it is allowed to be entirely absent from the bitstream without impact on the method of Kim. Richardson Decl., ¶ 68. This is consistent with Kim's claim language, which repeatedly includes "position information" of the corresponding I-frame *for a P-frame* but *not for an I-frame*. Ex. 1006 (Kim), claims 1-2, 8, 11. Thus, contrary to the Petition, the IAD for the I-frame cannot satisfy the claimed "indication of at least one image frame, which is the first image frame, in decoding order, of the independent sequence." Richardson Decl., ¶¶ 77-155.

Kim's Figure 4 explains the *decoding* process and again confirms that the IAD of the I-frame has no corresponding meaning.



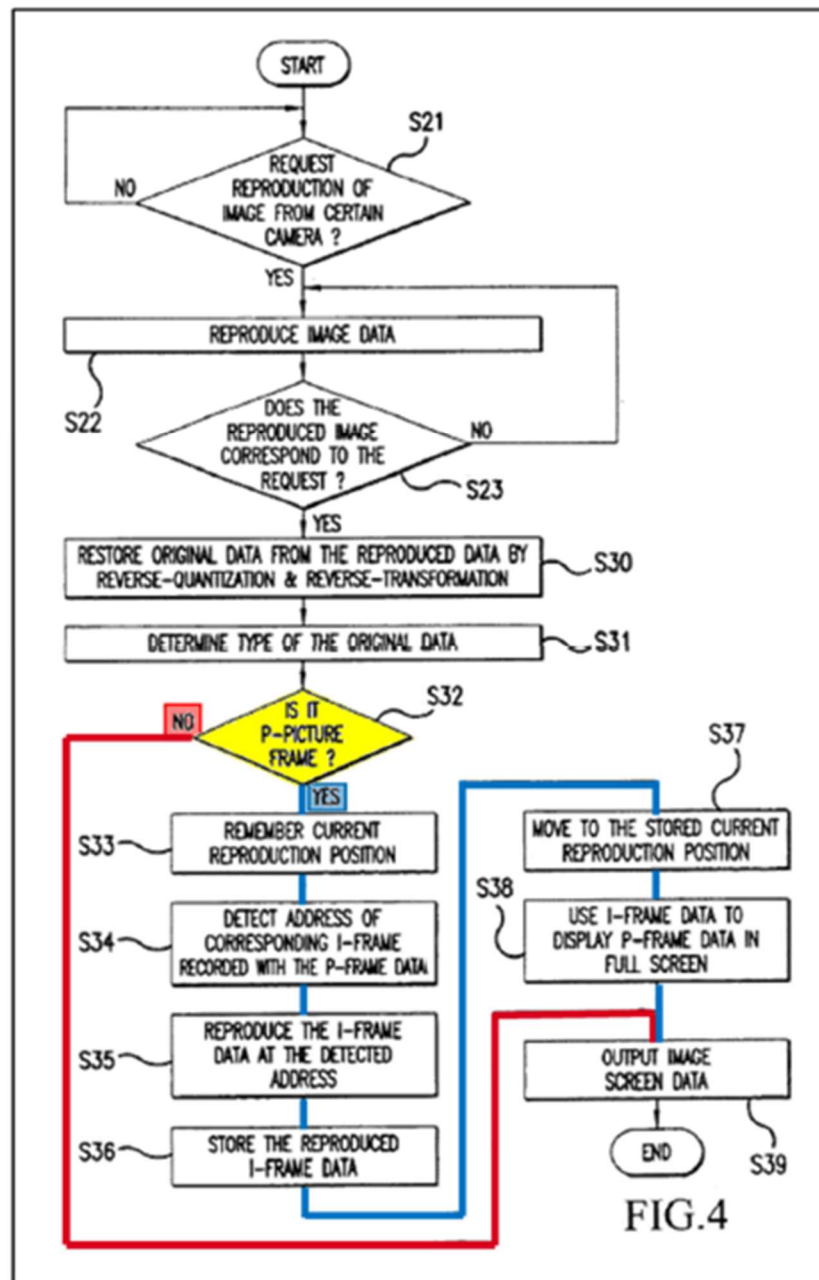
Richardson Decl., ¶ 72 (annotating Kim, Fig. 4 (excerpts)).

As shown in the annotated Figure 4 above, Kim explains that at “Step S30, the image data corresponding to the user’s request is transmitted and decoded in the decoder.” Ex. 1006 (Kim), 5:29-34. Thus, Kim’s decoder first decodes the image frame that the user selected for decoding, without yet being aware (until Step S31) whether that selected frame is an I-frame or a P-frame. Ex. 1006 (Kim), 5:35-38; Richardson Decl., ¶¶ 69-73.

If the image frame that the user selected is a P-frame, the corresponding I-frame address (the IAD of the P-frame) is detected at Step S34, and then the corresponding I-frame data is decoded *in part* at Step S36. Ex. 1006 (Kim), 5:39-52. The I-frame is not completely decoded at this point because the final reverse-transformation and reverse-quantization steps do not occur until later at Step S38. Richardson Decl., ¶ 71. The reverse-transformation and reverse-quantization steps are a required part of the decoding process. Ex. 1006 (Kim), 5:32-35. Later, at Step S38, the *partial* P-frame is combined with the reused portions of the *partial* I-frame and the moving (motion) vectors used for prediction, and then the resulting P-frame image is reverse-transformed and reverse-quantized, which completes the decoding process for the full P-frame. Ex. 1006 (Kim), 5:55-65. In other words, when the user-requested image to decode is a P-frame, only the P-frame is fully decoded, and the full I-frame is never reverse-transformed and reverse-quantized (only the parts that are used to predict the P-frame). Richardson Decl., ¶ 71.

Alternatively, when the image frame that the user selected is an I-frame, the corresponding coded image data is simply read from the optical disk, decoded and displayed. Ex. 1006 (Kim), 5:66-6:3. Critically, when the requested image is an I-frame, Step S34 to “detect address of corresponding I-frame recorded with the P-frame data” [IAD] (shown in red in the annotated Fig. 4 above) is *skipped* (as shown in orange in the annotated Fig. 4 above). Richardson Decl., ¶ 72. Both the Petition

and Dr. Havlicek show the exact same understanding in their own annotated Fig. 4, *i.e.*, that the IAD is only ever read and decoded *for the P-frame*, and not for the I-frame:



Pet., 11 (colors and annotations in original); Ex. 1003 (Havlicek Decl.), ¶ 59.

Therefore, according to Kim, the IAD is only used for the decoding of a P-frame, while the IAD *of the I-frame* is never read or decoded or used for any purpose, and may not exist, according to Kim. Richardson Decl., ¶ 73. A POSITA would have understood that the reason why Kim teaches that the IAD of the I-frame may even be absent from the bitstream entirely is that it makes no difference to the decoder what that value is, or whether it exists at all. Ex. 1006 (Kim), 4:65-5:1; Richardson Decl., ¶ 73. The decoder will never read, decode, or use the value for IAD of the I-frame.

This is consistent with Kim’s claim language, which repeatedly includes that the step of “detects the address of the corresponding intra-picture frame” occurs “if the restored image data frame is predictive picture frame data” and not “if the original image frame data type is not predictive picture frame data.” Ex. 1006 (Kim), claim 11; Richardson Decl., ¶ 74.

Therefore, one critical flaw in the Petition that applies to all the Challenged Claims is that Kim’s IAD of an I-frame cannot satisfy the claimed “*indication* of at least one image frame, which is *the first image frame, in decoding order*, of an independent sequence.” *See, e.g.*, Pet., 16-18, 31-35. As explained in further detail below, Kim additionally fails to disclose or render obvious several other limitations of the Challenged Claims of the ’321 Patent.

**D. Asserted Grounds**

Petitioner asserts the following grounds, none of which have a reasonable likelihood of success:

| Ground |     | Claims             | Prior Art    |
|--------|-----|--------------------|--------------|
| 1      | 103 | 1, 3-4, 6-8, 10-11 | Kim          |
| 2      | 103 | 2, 5, 9            | Kim + Adolph |

Pet., 2.

**E. Level of Ordinary Skill**

Petitioners allege that a person of ordinary skill in the art (POSITA) “would have had a (1) Bachelor’s degree in electrical engineering, computer engineer, computer science, or a comparable field of study such as physics, and (2) approximately two to three years of practical experience with video encoding/decoding . . . [and] [a]dditional experience can substitute for the level of education, and vice-versa.” Pet., 7. Because this Response does not depend on the definition of POSITA, Nokia has applied Petitioners’ definition. Nokia, nevertheless, reserves the right to argue in favor of a different level of skill should this Petition be instituted.

**F. Claim Construction**

Petitioners identify no claims for construction. Pet., 7. Nevertheless, Petitioners appear to dispute whether the steps of claim 8’s “method of *decoding*” must be performed by the *decoder*. Pet., 45-47. This argument is untenable on its

face and is addressed within the claim 8 analysis below.

Otherwise, Nokia does not believe that any constructions are necessary to deny this Petition. Nokia reserves the right to further address claim construction should this Petition be instituted.

### III. ARGUMENT

#### A. Petitioners Fail to Establish a Reasonable Likelihood That Claims 1, 3-4, 6-8, and 10-11 Are Unpatentable in Light of Ground 1 (Kim).

##### 1. Encoding claims – Petitioners fail to demonstrate that Kim discloses or renders obvious claims 1[a], 4[a], and 7[a].

Each of the independent encoding claims requires “encoding[/encode] into the video sequence an *indication* of at least one image frame, which is *the first image frame, in decoding order*, of the independent sequence,” which is identified as 1[a], 4[a], and 7[a] in the Petition. Pet., Listing of Challenged Claims. Petitioners rely solely on Kim’s IAD *of the I-frame* as the claimed indication. Pet., 16-18; Ex. 1003 (Havlicek Decl.), ¶ 73. However, there are multiple reasons why the IAD of the I-frame cannot satisfy the claimed limitation.

##### a) Kim’s IAD of the I-frame does not indicate anything.

First, the IAD of the I-frame does not disclose or render obvious the claimed “indication” because the IAD of the I-frame is not “an *indication*” of anything, let alone the required “at least one image frame, which is the first image frame, in decoding order, of the independent sequence.” As Kim explains, the IAD of the I-

frame may be “zero *or absent*” from the bitstream. Ex. 1006 (Kim), 4:65-5:1 (emphasis added); Pet., 16; Ex. 1003 (Havlicek Decl.), ¶ 70. The Petition specifically relies on situations where the IAD of the I-frame has a zero value (0000). Pet., 16-18; Ex. 1003 (Havlicek Decl.), ¶ 73. But Dr. Richardson explains that the reason why Kim allows the IAD of the I-frame to have the value of zero *or absent* is because, unlike the IAD *of the P-frame*, the IAD *of the I-frame* has no corresponding meaning and will never be used for anything. Richardson Decl., ¶¶ 79-90. This makes sense as the Kim reference, unlike the '321 Patent, does not appear to recognize and appreciate that the I-frames can be used to identify random access points in a video stream.

That is, Kim describes that the IAD of the P-frame is a “position value” of the corresponding I-frame. Ex. 1006 (Kim), 4:27-33, 4:48-52, claims 1-2, 8, 11. But Kim never describes the IAD *of the I-frame* as having any meaning at all. Richardson Decl., ¶ 80. This is confirmed by Kim’s description of the encoding process, as shown in annotated Figure 3 below:

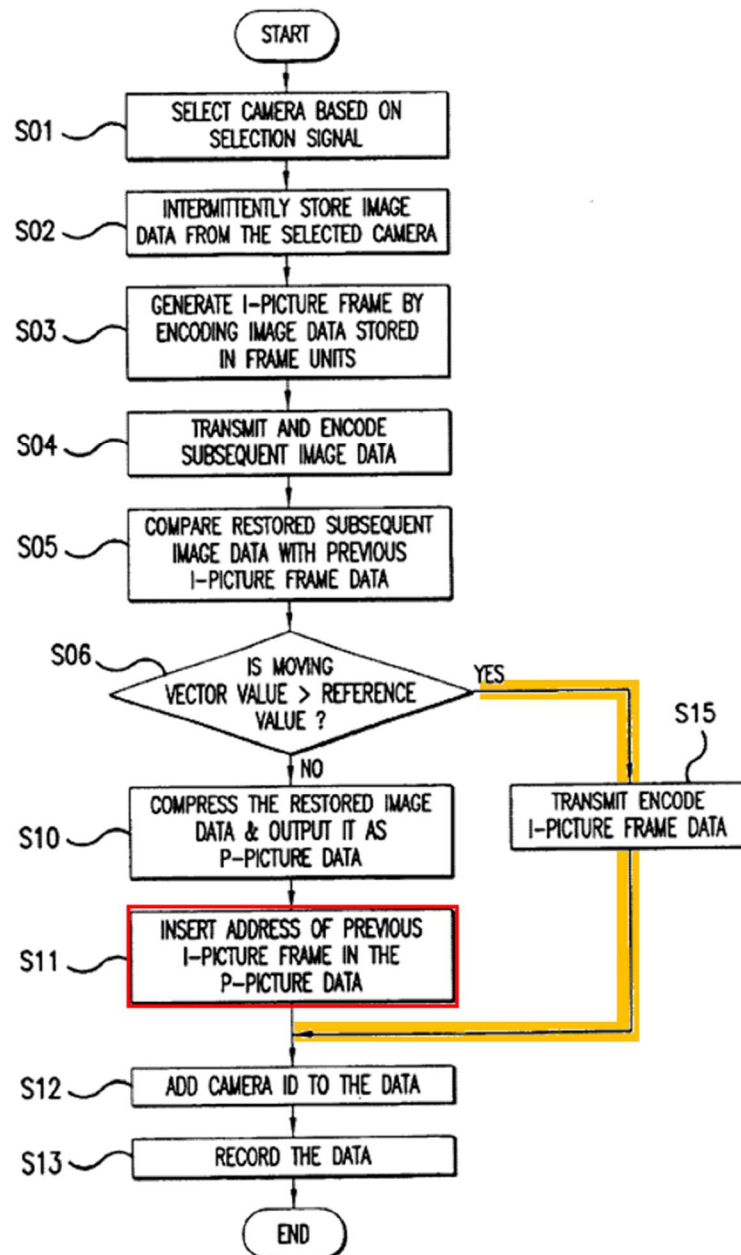


FIG.3

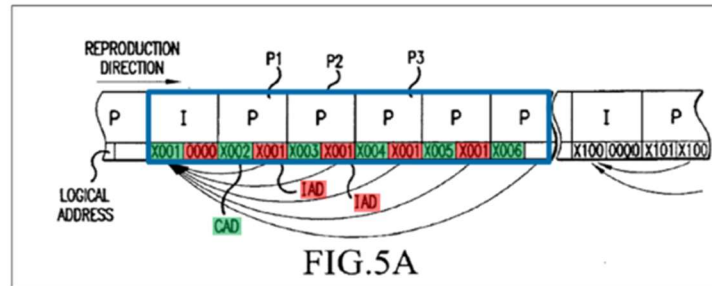
Richardson Decl., ¶ 81 (annotating Ex. 1006 (Kim), Fig. 3).

As shown in Figure 3, Kim's encoder decides whether to encode an image frame as an I-frame (not using prediction) or a P-frame (using prediction) in Step S06. Ex. 1006 (Kim), 4:12-27. If Kim's encoder encodes an image frame *as a P-*

*frame*, it will “insert [the] address of [the] previous I-picture frame in the P-picture data” in Step S11 (shown in red in the annotated figure above). Ex. 1006 (Kim), Fig. 3, 4:28-32. However, if Kim’s encoder encodes an image frame *as a I-frame*, it will skip Step S11 and simply insert a “zero” for the IAD value or leave the value completely *absent*. Ex. 1006 (Kim), Fig. 3, 4:65-5:1; Richardson Decl., ¶¶ 82-83. Because there is no analogous Step S11 for the I-frame, a POSITA would understand that Kim’s IAD of the I-frame has no corresponding meaning or use, and that is why the value is even allowed to be absent entirely from the bitstream. Richardson Decl., ¶ 83.

Although Kim’s Figure 6 still labels the IAD of the I-frame as “corresponding I-picture address,” both Petitioner and Dr. Havlicek admit that the address of the I-frame is its *CAD* value, not its IAD value. Pet., 10 (“I-pictures also have a CAD that indicates the picture’s current address.”); Ex. 1003 (Havlicek Decl.), ¶ 58 (same).

52.) I-pictures also have a CAD that indicates the picture's current address (EX1006, 4:65-5:1, Figs. 5A, 6 (“physical address”)), but the I-picture's IAD is zero (EX1006, Figs. 5A (showing “0000”), 6 (showing “00000000” for the “corresponding I-Picture address”)). Figure 5A below is annotated to highlight the IAD values in red and CAD values in green.



Pet., 10 (colors and annotations in original); Ex. 1003 (Havlicek Decl.), ¶ 58.

A POSITA would know that the IAD of the I-frame cannot be an actual address of specific I-frames or a meaningful value because all the I-frames have the same “zero or absent” value, and they all clearly cannot be stored at the same location. Richardson Decl., ¶ 84.

Critically, this is not a situation where the IAD of the I-frame indicates something when it has a “0000” value and indicates nothing when it is absent. The IAD of the I-frame never has any meaning, whether it is zero or absent, which is why it is allowed to be entirely absent from the bitstream in the first place. Richardson Decl., ¶¶ 83-84. Thus, Kim never discloses or renders obvious that the IAD of the I-frame is the claimed “indication” of anything, even when it takes a “0000” value.

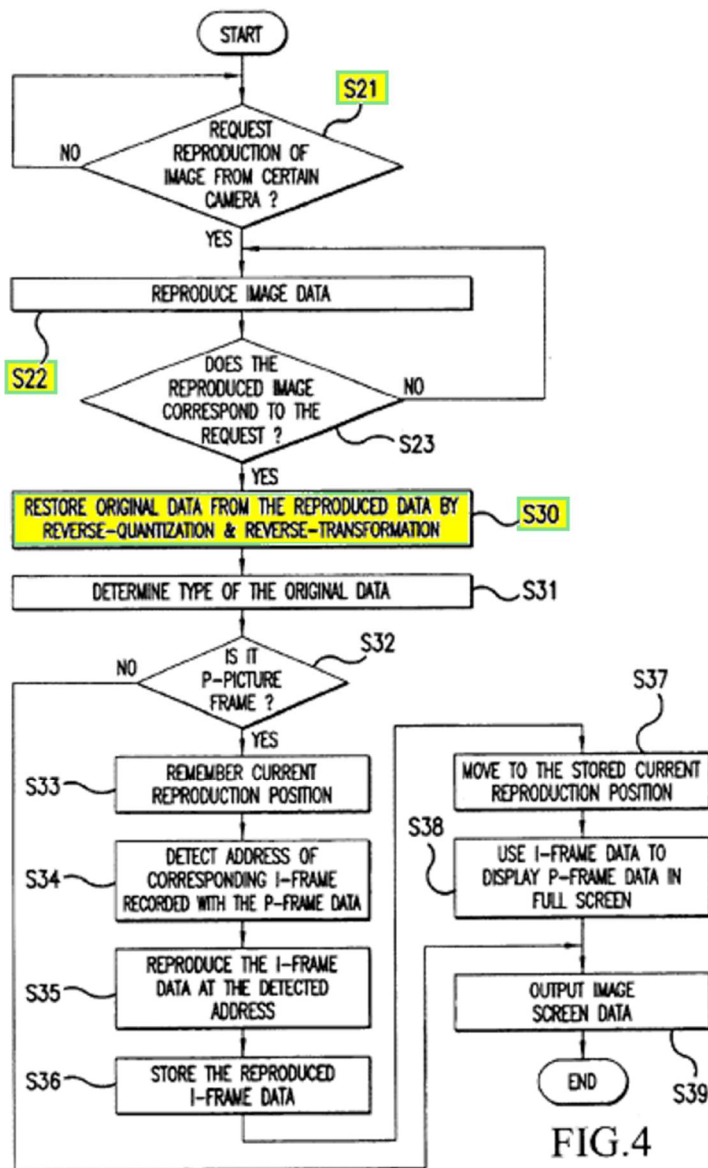
In the previous ITC Investigation that considered Kim and found the asserted claims of the '321 Patent valid over Kim, expert Dr. Omid Kia testified that “[f]or an I-frame, that IAD does not serve any purpose” and “that value serves no function in the decoding.” Ex. 2013 (1380 Public Tr.), 26 (1733:1-7).

Neither the Petition nor its expert, Dr. Havlicek, address this critical flaw in Kim. Nor does the Petition or Dr. Havlicek assert that there would be any motivation to modify Kim in any way to make the IAD of the I-frame have a corresponding meaning or make it an “indication” as required by the claims. For this reason alone, Kim cannot disclose or render obvious any of the encoding claims 1-7 of the '321 Patent.

**b) Kim’s IAD of the I-frame does not indicate the required “first image frame, in decoding order.”**

A second reason Kim does not disclose or render obvious limitations 1[a], 4[a], or 7[a] is that the IAD of the I-frame does not indicate the “first image frame, in decoding order” as required by the claims. As explained above, the IAD of the I-frame is not an indication of anything. Additionally, Kim’s disclosures show that the IAD of the I-frame is certainly not an indication of the first image in decoding order.

Rather Kim explains that the first image in decoding order is whichever image the user selects to decode. Ex. 1006 (Kim), 5:29-34 (“In Step S30, the image data corresponding to the user’s request is transmitted and decoded in the decoder”).



Richardson Decl., ¶ 94 (annotations added to Ex. 1006 (Kim), Fig. 4).

There is no consideration of the value of the IAD of the I-frame to indicate to the decoder what frame should be the first image frame in decoding order, or the start of an independent sequence. Richardson Decl., ¶ 92. Kim's decoder simply decodes the picture that the user selected in Steps S21 and S22. Ex. 1006 (Kim),

5:13-32. Indeed, Kim's decoder decodes the selected image frame in Step S30 before even determining whether the image frame was an I-frame or a P-frame at Step S31.

Ex. 1006 (Kim), 5:30-38; Richardson Decl., ¶ 92.

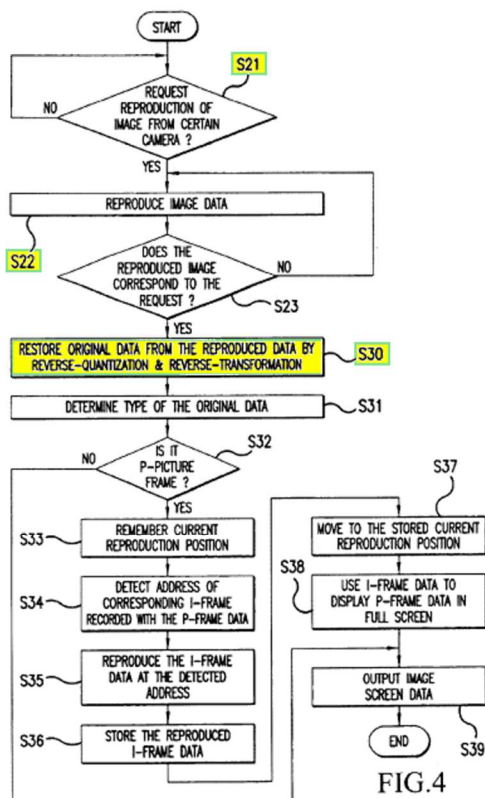


FIG. 4

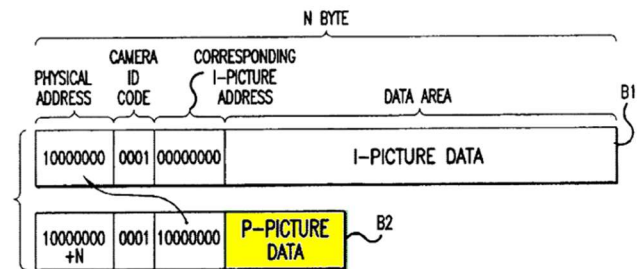


FIG. 6

Richardson Decl., ¶ 94 (annotating Ex. 1006 (Kim), Fig. 4 and Fig. 6).

The example where a user selects a P-frame to decode highlights the fact that the IAD of the I-frame does not (and cannot) indicate that the I-frame is the first image frame in decoding order as required by the claims. In particular, when the user selects a P-frame, Kim's decoder partially decodes the P-frame (this data is only part of the full P-frame because the full P-frame includes the partially decoded P-frame

and the partial I-frame) in Step S30, including reverse-quantization and reverse-transformation (shown in yellow above). Ex. 1006 (Kim), 5:30-35 (“In Step S30, the image data corresponding to the user’s request is transmitted and decoded in the decoder 111. The decoding process of the decoder 111 involves reverse-quantization and reverse-transformation to restore the original image data prior to data compression carried out during recording.”). This shows that the IAD of the I-frame does not indicate the first image frame in decoding order because when the image data for the P-frame at Step S30 is decoded, neither the IAD of the P-frame nor the IAD of the I-frame has been read or decoded (shown in red below). Ex. 1006 (Kim), Fig. 4; Richardson Decl., ¶¶ 94-96 (explaining how Step S34 occurs well after Step S30, and only occurs when the image frame is a P-frame). The first image frame in decoding order is therefore whatever image frame the user selects, and has no relation to the value of the IAD for the I-frame. Richardson Decl., ¶ 94.

Neither Petitioners nor Dr. Havlicek address this problem with Kim in the context of the encoding claims. To the extent that the Petition’s discussion for decoding claim 8[b] applies here, Petitioners are wrong that Kim decodes the I-frame before decoding the P-frame even when the user selects a P-frame. Pet., 39-40. Petitioners assert that “the system decodes the I-picture (the first image frame of the independent sequence) before it can produce the P-picture that depends on it.” *Id.* However, Kim expressly states that the reverse-quantization and reverse-

transformation steps of the decoding process do not occur for the I-frame itself, but rather only occur for the parts of the I-frame that are used for prediction of the P-frame (shown in blue below) *after* those parts are combined with the rest of the P-frame data (shown in yellow below) at Step S38. Ex. 1006 (Kim), 5:55-65; Richardson Decl., ¶¶ 96-97.

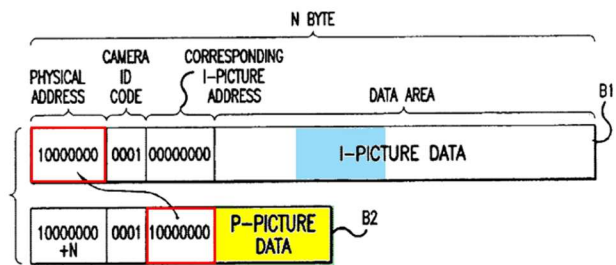
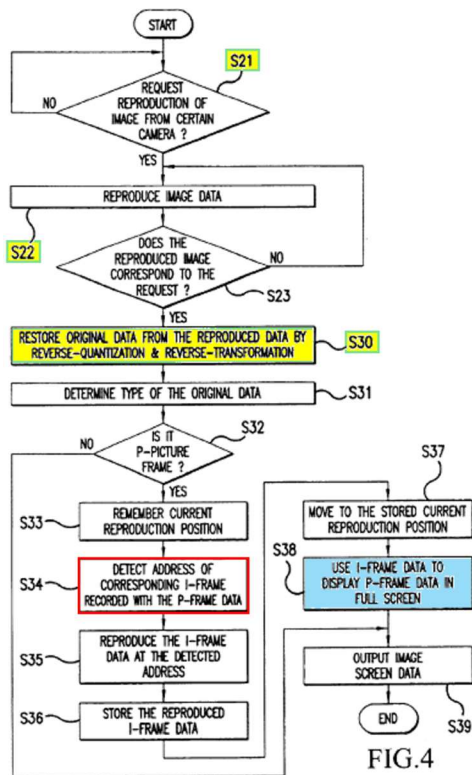


FIG. 6

Richardson Decl., ¶ 96 (annotating Ex. 1006 (Kim), Fig. 4 and Fig. 6).

Therefore, even though the P-frame needs portions of the I-frame to complete the full image reproduction (shown in blue above), Kim's decoder does not decode the full I-frame first; rather, when the user selects a P-frame, only the P-frame is fully decoded. Richardson Decl., ¶ 97. Neither the Petition nor Dr. Havlicek address

this critical point. Indeed, Dr. Havlicek’s opinions cited by the Petition merely parrot the Petition verbatim without any further explanation. Pet., 39-40 (citing Ex. 1003, ¶¶ 132-133).<sup>1</sup>

Rather than analyze the actual disclosures of Kim, the Petition merely concludes without explanation that “[b]ecause each I-picture starts an independent sequence, the IAD of 0000 (or zero) indicates that that picture starts an independent sequence (i.e., “is the first image frame, in decoding order, of an independent sequence”).” Pet., 16. Critically, Petitioner provides no evidence or explanation how the IAD of the I-frame *indicates* that the picture is “the first image frame, *in decoding order*, of an independent sequence” as required by the claim. Dr. Havlicek, similarly,

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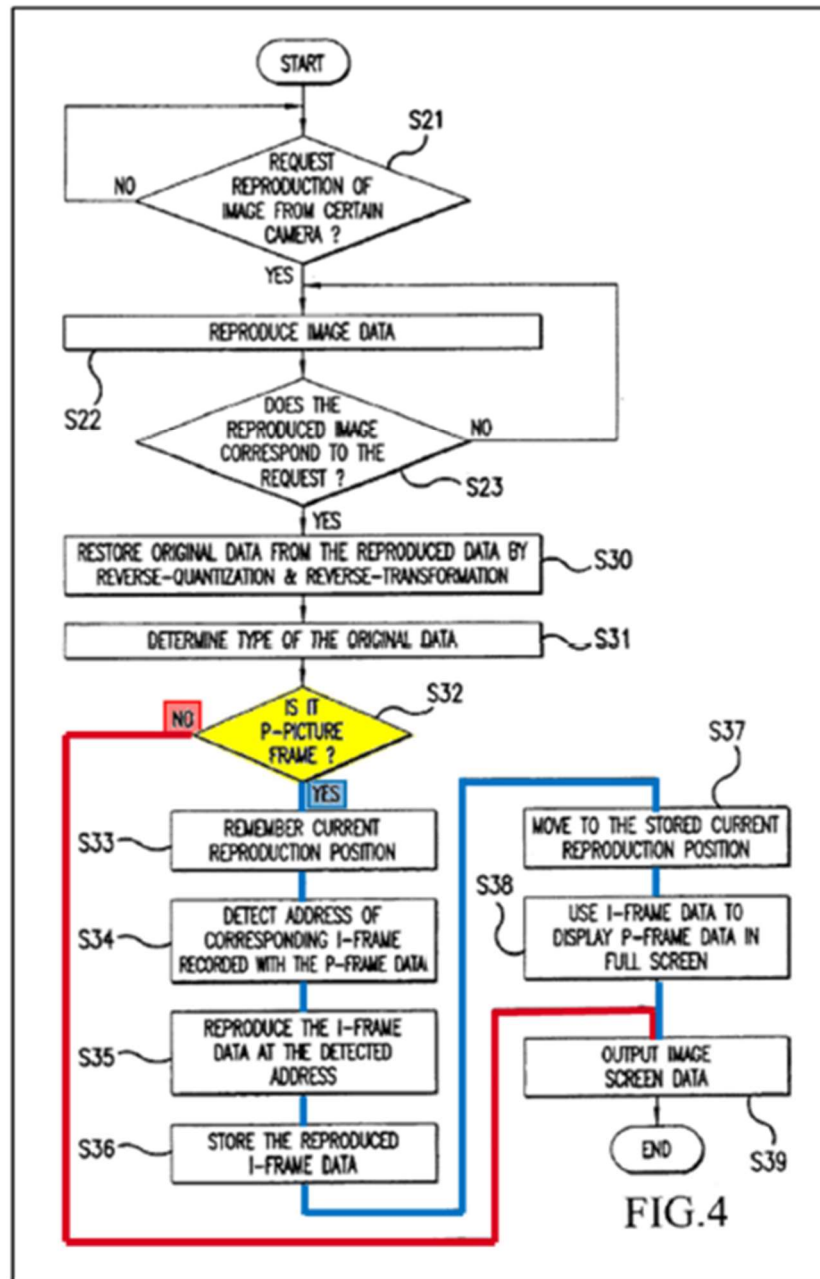
<sup>1</sup> Dr. Havlicek’s copy and paste of the Petition is entitled little to no weight. *Kinetic Technologies, Inc. v. Skyworks Solutions, Inc.*, IPR2014-00529, Paper 8 at 14-15 (PTAB Sep. 23, 2014) (“merely repeating an argument from the Petition in the declaration of a proposed expert does not give that argument enhanced probative value.”); *Facebook, Inc. v. Voxer IP LLC*, IPR2021-00399, Paper 8 at 22 (PTAB July 21, 2021) (“Petitioner cites [Expert’s] declaration to support its arguments. . . [Expert’s] arguments, however, mirror the arguments set forth in the Petition and do not provide further support for Petitioner’s position”).

merely states the same conclusion verbatim without support for his opinions.<sup>2</sup> Ex. 1003 (Havlicek Decl.), ¶ 71.

In fact, both the Petition and Dr. Havlicek agree that when the selected image frame is an I-frame, the decoding process in Kim *skips* the step of reading the IAD value. Pet., 10-11; Ex. 1003 (Havlicek Decl.), ¶ 59.

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<sup>2</sup> See *Samsung Electronics Co., Ltd. et al v. RightQuestion, LLC*, IPR2022-0025, Paper 17 at 24 (PTAB June 9, 2022) (“Petitioner’s declarant also makes this same statement verbatim, without more, and with no further explanation or additional citations to evidence. . . We give such conclusory, unsupported assertions by Petitioner’s expert little or no weight.”); *Rohm and HaasCo. v. Brotech Corp.*, 127 F.3d 1089, 1092 (Fed. Cir. 1997) (noting that a fact finder is not required to “credit the unsupported assertions of an expert witness”); 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”).



Pet., 11 (Ex. 1006 (Kim), Fig. 4 (annotations added))

As Kim's decoding process explains, Step S34 of Figure 4 to detect the IAD is only performed for a P-frame (blue path in the annotated Figure 4 above), and that step is skipped for an I-frame (red path in the annotated Figure 4 above). Ex. 1006

(Kim) at 5:66-6:3; Richardson Decl., ¶¶ 96-97. The Board also acknowledged this in a prior proceeding. Ex. 1021 (IPR2025-01068, Paper No. 10), 58 (“[a]fter decoding the image data, Kim’s controller uses the IAD in the image data, e.g. to ‘detect[] the address of the corresponding I-picture frame’ *if the image data is a P-picture.*”) (emphasis added).

Thus, no matter what type of image frame is selected by the user, the IAD *of the I-frame* (the alleged “indication” in the Petition) is never read, decoded, or used for anything in Kim. Richardson Decl., ¶ 98. The image that is decoded first is the image that is selected by the user; there is no indication of any first frame in decoding order coming from the IAD of the I-frame. Richardson Decl., ¶¶ 96-99. In the previous ITC Investigation, Nokia’s expert Dr. Omid Kia agreed that “[i]t is the user that selects the picture to decode” and not the value of the IAD of the I-frame. Ex. 2013 (1380 Public Tr.), 23-24 (1730:10-1731:2). Therefore, the IAD of the I-frame cannot be “an *indication* of at least one image frame, which is *the first image frame, in decoding order*, of the independent sequence.”

That there may, out of happenstance, be an occasion where an I-frame was selected by user to be decoded first, and the IAD of that I-frame has a zero value, does not transform that IAD value into an indication of anything. It is still unrebutted that there are no steps in the encoding or decoding process of Kim that ever uses the

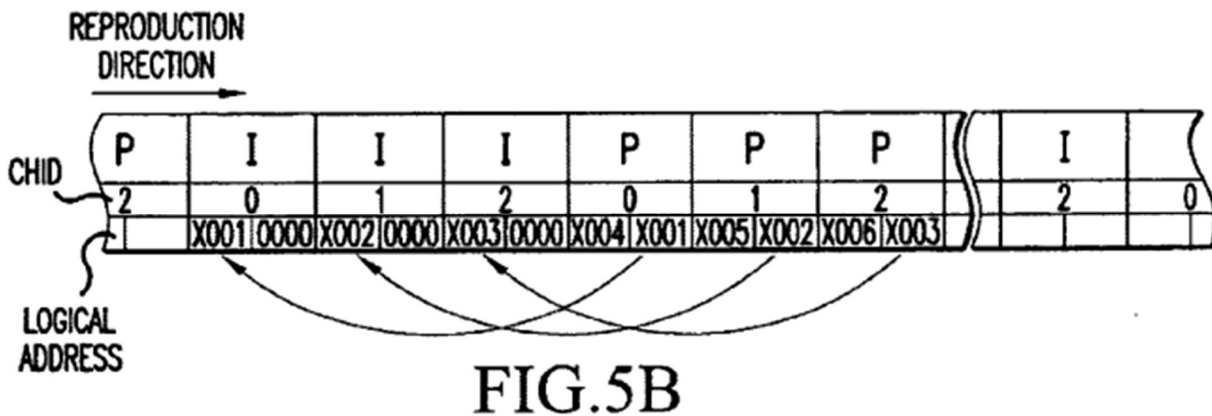
IAD *of the I-frame* to indicate an image frame to decode first. Richardson Decl., ¶¶ 79-104.

Neither the Petition nor Petitioners' expert, Dr. Havlicek, resolve this critical flaw in Kim. Nor does the Petition or Dr. Havlicek assert that there would be any motivation to modify Kim in any way to make the IAD of the I-frame have a corresponding meaning or make it an "indication" as required by the claims. For this additional reason, Kim cannot disclose or render obvious any of the encoding claims 1-7 of the '321 Patent.

**c) Kim does not have a "video sequence."**

Kim is not related to streaming video and does not have a "video sequence," as required by the claims. Richardson Decl., ¶¶ 105-13. Rather, Kim describes intermittent time lapse recording that requires "mov[ing] and stop[ping] the tape repeatedly" to capture time lapsed single images. Ex. 1006 (Kim), 1:57-60. Kim explains that "only the desired images can be selectively reproduced with high display quality." Ex. 1006 (Kim), 6:17-20. In fact, Kim does not discuss independently decodable video sequences anywhere in its disclosure. This makes sense given Kim's emphasis on intermittently stored *individual image frames*. Ex. 1006 (Kim), 1:38-45. Thus, Kim teaches the select encoding and decoding of individual images at a time, and not encoding or decoding of the video sequence of the '321 Patent. Richardson Decl., ¶ 106.

Kim's Figure 5B demonstrates that Kim does not disclose or suggest a video sequence. Figure 5B is a stream of images that alternate between three different cameras. Ex. 1006 (Kim), 4:56-58.



Ex. 1006 (Kim) at Fig. 5B.

Watching the stream of images from left to right as a video sequence would have resulted in a temporally disjointed and nonsensical sequence of hopping between different cameras for every image frame. Richardson Decl., ¶¶ 106-12. A POSITA would not have understood Kim to disclose or suggest viewing such a sequence as continuous video. Richardson Decl., ¶¶ 106-12. In the previous ITC Investigation, Dr. Omid Kia agreed that Kim does not disclose or suggest recording or playback of continuous video, and instead only describes decoding a single image rather than a video sequence. Ex. 2013 (1380 Public Tr.), 19 (1726:1-23), 20 (1727:5-20).

Perhaps recognizing this problem, neither the Petition nor Dr. Havlicek even attempt to explain how encoding and decoding of single images in Kim can satisfy a video sequence of claim 1[a], 4[a], or 7[a]. Pet., 16-18, 26, 29; Ex. 1003 (Havlicek Decl.), ¶¶ 69-74, 94-95, 108-109. Nor does the Petition or Dr. Havlicek assert any motivation to modify or combine Kim in such a way as to meet the “video sequence” of claim 1[a], 4[a], or 7[a]. A POSITA, in fact, would not have been motivated to do so in view of Kim’s express teaching that “only the desired images can be selectively reproduced with high display quality.” Ex. 1006 (Kim), 6:17-20; Richardson Decl., ¶ 109. A POSITA would have understood that modifying Kim to repeatedly encode and decode images into a video sequence would have required more effort, processing power, memory, and cost. Richardson Decl., ¶ 110. It would not have been efficient and necessary for the applications that Kim targeted, which only need individual time lapse images rather than a video sequence. Ex. 1006 (Kim), 1:14-20; Richardson Decl., ¶ 110.

For this additional reason, Kim cannot disclose or render obvious any of the encoding claims 1-7 of the ’321 Patent.

**2. Decoding claims – Petitioner fails to demonstrate that Kim discloses or renders obvious claims 8[a], 10[a], and 11[a].**

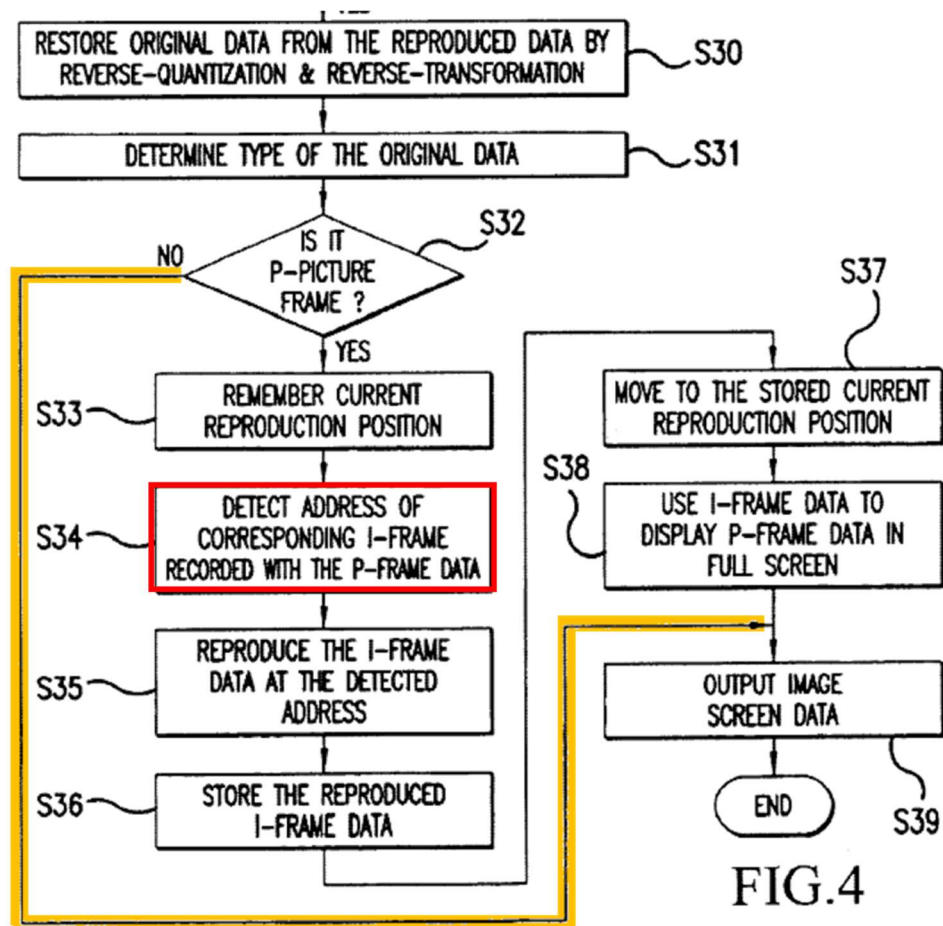
Each of the independent decoding claims requires “decoding[/decode] from the video sequence an *indication* of at least one image frame, which is *the first*

*image frame, in decoding order*, of an independent sequence, wherein all motion-compensated temporal prediction references of the independent sequence refer only to image frames within said independent sequence,” which is identified as 8[a], 10[a], and 11[a] in the Petition. Pet., Listing of Challenged Claims. As with the encoding claims, Petitioner relies solely on Kim’s IAD *of the I-frame* as the claimed indication. Pet., 33-35; Ex. 1003 (Havlicek Decl.), ¶¶ 122-125. Again, there are multiple reasons why the IAD of the I-frame cannot satisfy the claimed limitation.

**a) Kim’s IAD of the I-frame does not indicate anything.**

First, as with the encoding claims, the IAD of the I-frame does not disclose or render obvious the claimed “indication” because the IAD of the I-frame is not “an *indication*” of anything, let alone the required “at least one image frame, which is the first image frame, in decoding order, of the independent sequence.” As Kim explains, the IAD of the I-frame may be “zero or absent” from the bitstream. Ex. 1006 (Kim), 4:65-5:1 (emphasis added); Pet., 34; Ex. 1003 (Havlicek Decl.), ¶ 122. The Petition specifically relies on situations where the IAD of the I-frame has a zero value (0000). Pet., 34; Ex. 1003 (Havlicek Decl.), ¶ 122. But Dr. Richardson explains that the reason why Kim allows the IAD of the I-frame to have the value of zero or absent is because, unlike the IAD *of the P-frame*, the IAD *of the I-frame* has no corresponding meaning and will never be used for anything. Richardson Decl., ¶¶ 116-29.

Kim describes that the IAD of the P-frame is a “position value” of the corresponding I-frame. Ex. 1006 (Kim), 4:27-33, 4:48-52; claims 1-2, 8, 11. But Kim never describes the IAD *of the I-frame* as having any meaning at all. Richardson Decl., ¶ 117. This is confirmed by Kim’s description of the decoding process, as shown in the annotated excerpt of Figure 4 below:

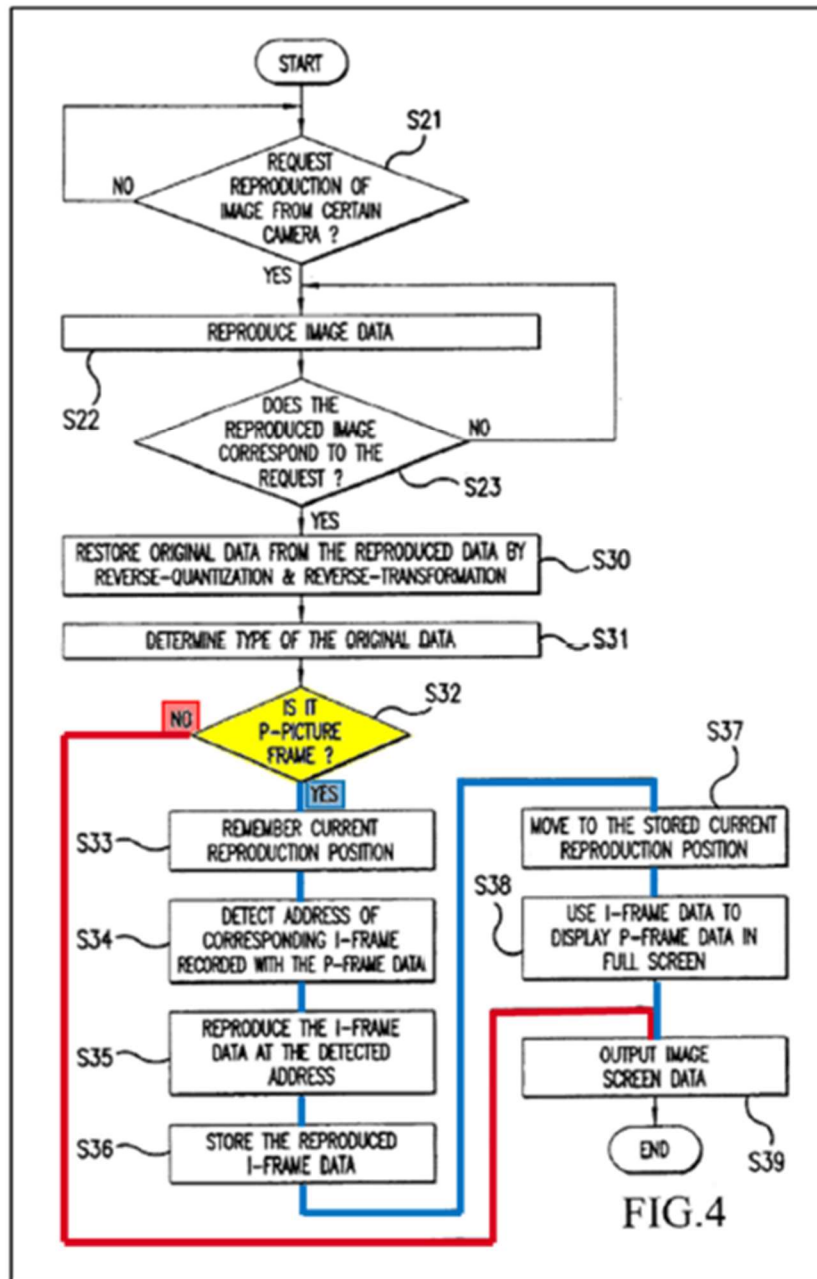


Richardson Decl., ¶ 118 (annotating Ex. 1006 (Kim), Fig. 4).

As shown in Figure 4, Kim’s decoder processes I-frames differently than P-frames. While the process for decoding a P-frame includes Step S34 (outlined in red

above) to “detect address of corresponding I-frame recorded with the P-frame data,” the process for decoding an I-frame (shown in orange above) *skips* that step. Kim explains that when the user selected image frame is an I-frame, the corresponding coded image data is simply read from the optical disk, decoded and displayed. Ex. 1006 (Kim), 5:66-6:3. Therefore, Kim’s decoder never detects the IAD *of the I-frame*. It only detects the IAD *of the P-frame*. Richardson Decl., ¶ 119.

Notably, both the Petition and Dr. Havlicek agree that Step S34 of the decoding process to read the IAD only happens for the P-frame. Pet., 10; Ex. 1003 (Havlicek Decl.), ¶ 59. As both the Petition and Dr. Havlicek highlight in red below, when the image is an I-frame, Kim’s decoder skips Step S34 and does not detect the IAD of the I-frame. Step S34 to detect the IAD, only occurs when the image is a P-frame, as shown in blue below.



Pet., 11 (colors and annotations in original); Ex. 1003 (Havlicek Decl.), ¶ 59.

Kim never describes any step in which the IAD *of the I-frame* is ever decoded, read, or used for any purpose. A POSITA would have understood that is the reason Kim teaches that the IAD of the I-frame may even be absent from the bitstream entirely because the decoder never uses it. Ex. 1006 (Kim), 4:65-5:1; Richardson

Decl., ¶ 120. This is consistent with the language of Kim’s claims, which include the step of “detects the address of the corresponding intra-picture frame” only “if the restored image data frame is predictive picture frame data” (P-frame) and not “if the original image frame data type is not predictive picture frame data” (I-frame). Ex. 1006 (Kim), claim 11; Richardson Decl., ¶ 121.

As explained previously, Kim’s Figure 6 labeling the IAD of the I-frame as “corresponding I-picture address” does not indicate to a POSITA that there is any such meaning to that value. Richardson Decl., ¶ 124. Both Petitioner and Dr. Havlicek admit that the address of the I-frame is its *CAD* value, not its IAD value. Pet., 10; Ex. 1003 (Havlicek Decl.), ¶ 58. The IAD of the I-frame cannot be an address because all the I-frames have the same “zero or absent” value, and they all clearly cannot be stored at the same location. Richardson Decl., ¶ 124.

As also explained previously, this is not a situation where the IAD of the I-frame indicates something when it has a 0000 value and indicates nothing when it is absent. The IAD of the I-frame never has any meaning, whether it is zero or absent, which is why it is allowed to be entirely absent from the bitstream in the first place. Richardson Decl., ¶¶ 125-26. Thus, Kim never discloses or renders obvious that the IAD of the I-frame is an “indication” of anything, even when it takes a 0000 value.

In the previous ITC Investigation that considered Kim and found claims 8 and 11 of the ’321 Patent valid over Kim, Dr. Omid Kia testified that “[f]or an I-frame,

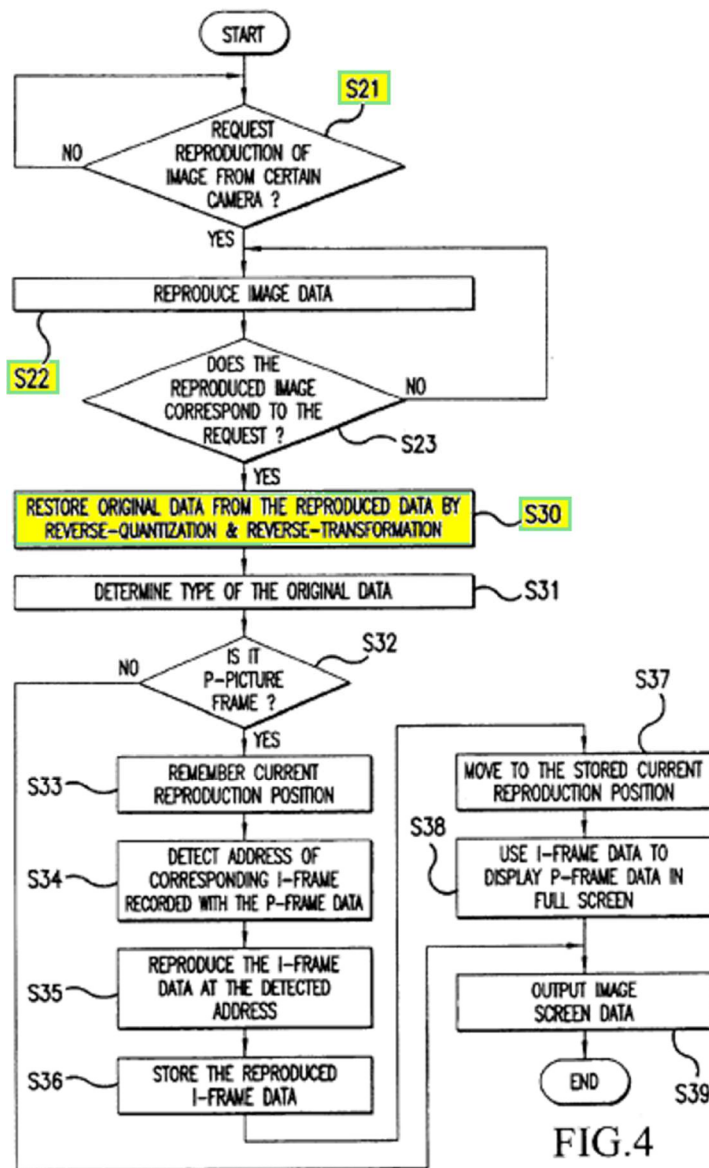
that IAD does not serve any purpose” and “that value serves no function in the decoding.” Ex. 2013 (1380 Public Tr.), 26 (1733:1-7).

As before, neither the Petition nor Dr. Havlicek address this critical flaw in Kim. Nor does the Petition or Dr. Havlicek assert that there would be any motivation to modify Kim in any way to make the IAD of the I-frame have a corresponding meaning or make it an “indication” as required by the claims. For this reason alone, Kim cannot disclose or render obvious any of the decoding claims 8-11 of the ’321 Patent.

**b) Kim’s IAD of the I-frame does not indicate the required “first image frame, in decoding order.”**

As with the encoding claims, a second reason Kim does not disclose or render obvious the decoding claims is that the IAD of the I-frame does not indicate the “first image frame, in decoding order” as required. As explained above, the IAD of the I-frame is not an indication of anything. Additionally, Kim’s disclosures show that the IAD of the I-frame is certainly not an indication of the first image in decoding order.

Kim explains that the first image in decoding order is whichever image the user selects to decode. Ex. 1006 (Kim), 5:29-34 (“In Step S30, the image data corresponding to the user’s request is transmitted and decoded in the decoder”).

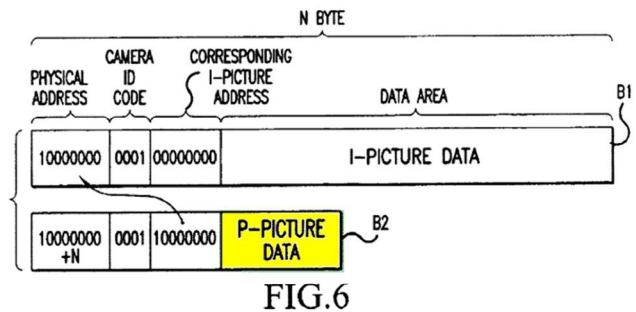
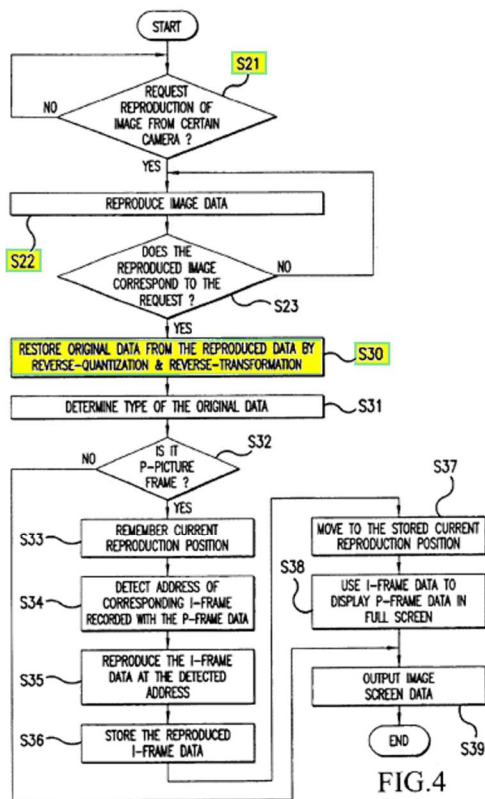


Ex. 1006 (Kim), Fig. 4 (annotations added to Steps S20, S21, S30).

There is no consideration of the value of the IAD of the I-frame to indicate to the decoder what frame should be the first image frame in decoding order. Richardson Decl., ¶¶ 130-40. Kim's decoder simply decodes the picture that the user selected in Steps S21 and S22. Ex. 1006 (Kim), 5:13-32. Indeed, Kim's decoder

decodes the selected image frame in Step S30 before even determining whether the image frame was an I-frame or a P-frame at Step S31. Ex. 1006 (Kim), 5:30-38; Richardson Decl., ¶¶ 131-32.

As explained above, in the example where a user selects a P-frame to decode, Kim's decoder partially decodes the P-frame (which is only part of the full P-frame because the resulting full P-frame will also include the partial I-frame) in Step S30, including the final decoding steps of reverse-quantization and reverse-transformation (shown in yellow below). Ex. 1006 (Kim), 5:30-35. When the partial P-frame is decoded at Step S30, the IAD of the I-frame has not been read or decoded. Ex. 1006 (Kim), Fig. 4; Richardson Decl., ¶ 133 (explaining how Step S34 occurs well after Step S30, and only occurs when the image frame is a P-frame). This shows that the IAD of the I-frame does not indicate the first image frame in decoding order. The first image frame in decoding order is whatever image frame the user selects, and has no relation to the value of the IAD for the I-frame. Richardson Decl., ¶ 133.



Richardson Decl., ¶ 133 (annotating Ex. 1006 (Kim), Fig. 4 and Fig. 6).

Neither Petitioners nor Dr. Havlicek addresses this problem with Kim in the context of claim 8[a]. To the extent that the Petition’s discussion for decoding claim 8[b] applies here, Petitioners are wrong that Kim decodes the I-frame before decoding the P-frame even when the user selects a P-frame. Pet., 39-40. Petitioners assert that “the system decodes the I-picture (the first image frame of the independent sequence) before it can produce the P-picture that depends on it.” *Id.* However, Kim expressly states that the reverse-quantization and reverse-transformation steps of the decoding process do not occur for the I-frame itself, but rather only occur for the parts of the I-frame that are used for prediction of the P-frame *after* those parts are

combined with the rest of the P-frame data at Step S38. Ex. 1006 (Kim), 5:55-65; Richardson Decl., ¶¶ 134-35. Therefore, even though the P-frame needs portions of the I-frame to complete the full image reproduction (shown in blue below), Kim's decoder does not decode the full I-frame first; rather, when the user selects a P-frame, only the P-frame is fully decoded. Richardson Decl., ¶¶ 134-37.

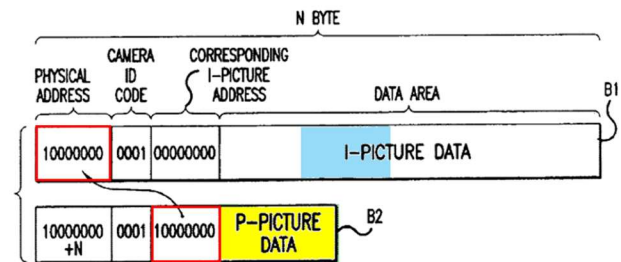
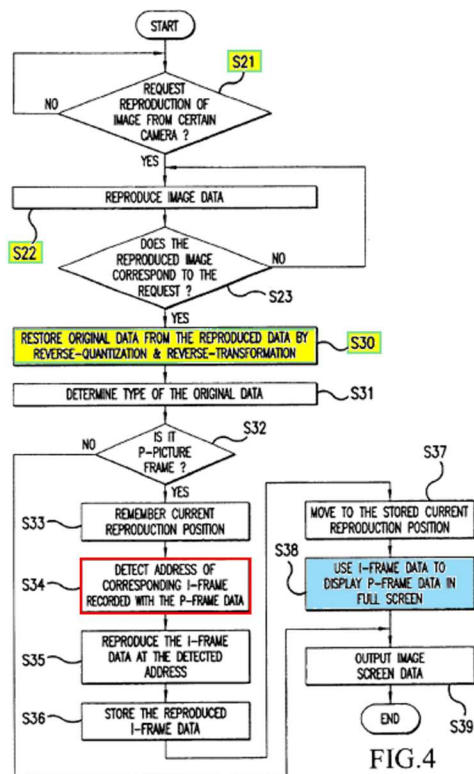


FIG. 6

Richardson Decl., ¶ 135 (annotating Ex. 1006 (Kim), Fig. 4 and Fig. 6).

Neither the Petition nor Dr. Havlicek address this critical point. Indeed, Dr. Havlicek’s opinions cited by the Petition merely parrot the Petition verbatim without any further explanation. Pet., 39-40 (citing Ex. 1003, ¶¶ 132-133).<sup>3</sup>

Rather than analyze the actual disclosures of Kim, the Petition merely concludes without explanation that “[b]ecause each I-picture starts an independent sequence, the IAD of 0000 or zero indicates that a given I-picture starts an independent sequence (i.e., “is the first image frame, in decoding order, of an independent sequence”).” Pet., 34. Again, Petitioners provide no evidence or explanation as to how the IAD of the I-frame *indicates* that the picture is “the first image frame, *in decoding order*, of an independent sequence” as required by the

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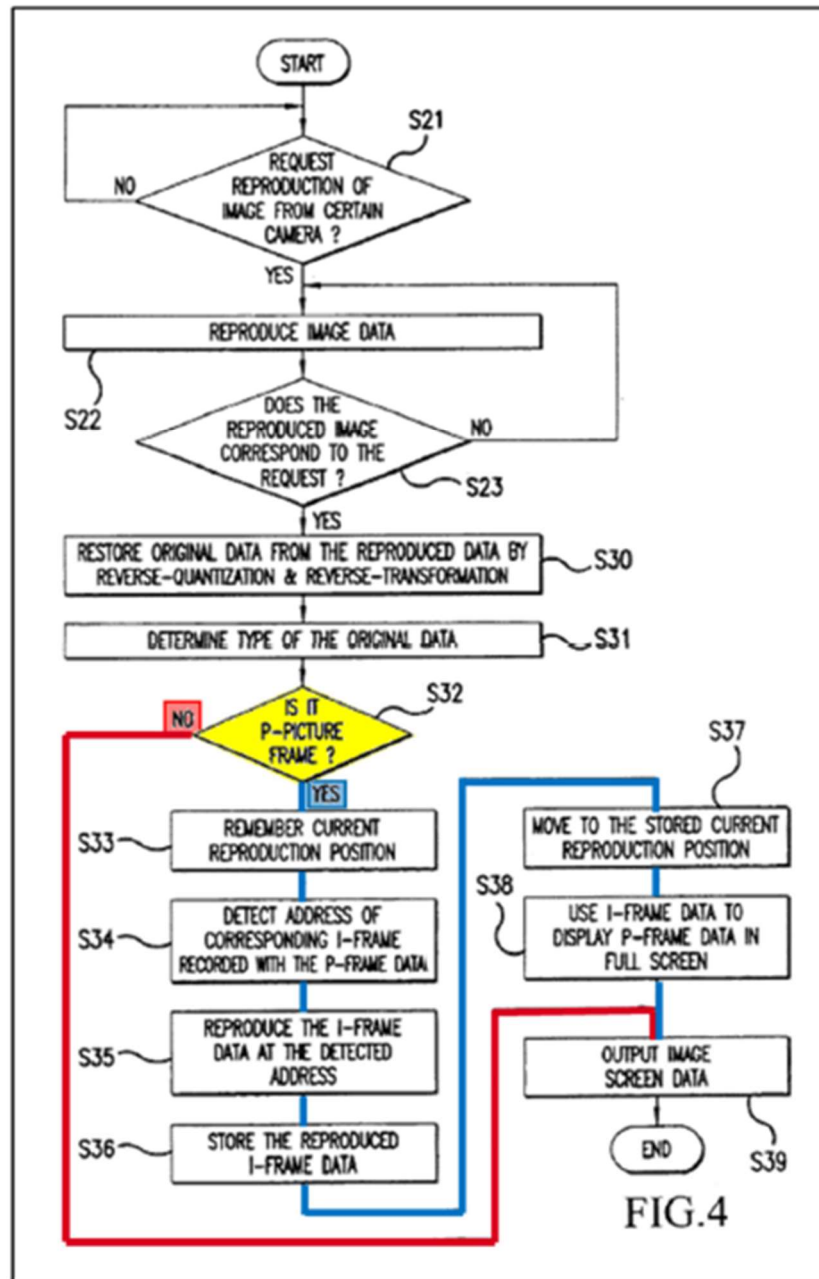
<sup>3</sup> Dr. Havlicek’s copy and paste of the Petition is entitled little to no weight. *Kinetic Technologies, Inc. v. Skyworks Solutions, Inc.*, IPR2014-00529, Paper 8 at 14-15 (PTAB Sep. 23, 2014) (“merely repeating an argument from the Petition in the declaration of a proposed expert does not give that argument enhanced probative value.”); *Facebook, Inc. v. Voxer IP LLC*, IPR2021-00399, Paper 8 at 22 (PTAB July 21, 2021) (“Petitioner cites [Expert’s] declaration to support its arguments. . . [Expert’s] arguments, however, mirror the arguments set forth in the Petition and do not provide further support for Petitioner’s position”).

claims. Dr. Havlicek, similarly, merely states the same conclusion verbatim without support for his opinions.<sup>4</sup> Ex. 1003 (Havlicek Decl.), ¶ 122.

In fact, both the Petition and Dr. Havlicek agree that when the selected image frame is an I-frame, the decoding process in Kim *skips* the step of reading the IAD value. Pet., 10-11; Ex. 1003 (Havlicek Decl.), ¶ 59.

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<sup>4</sup> See *Samsung Electronics Co., Ltd. et al v. RightQuestion, LLC*, IPR2022-0025, Paper 17 at 24 (PTAB June 9, 2022) (“Petitioner’s declarant also makes this same statement verbatim, without more, and with no further explanation or additional citations to evidence. . . We give such conclusory, unsupported assertions by Petitioner’s expert little or no weight.”); *Rohm and HaasCo. v. Brotech Corp.*, 127 F.3d 1089, 1092 (Fed. Cir. 1997) (noting that a fact finder is not required to “credit the unsupported assertions of an expert witness”); 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”).



Pet., 11 (Ex. 1006 (Kim), Fig. 4 (annotations added))

As Kim's decoding process explains, Step S34 of Figure 4 to detect the IAD is only performed for a P-frame (blue path in the annotated Figure 4 above), and that step is skipped for an I-frame (red path in the annotated Figure 4 above). Ex. 1006

(Kim), 5:66-6:3; Richardson Decl., ¶¶ 134-37. The Board also acknowledged this in a prior proceeding. Ex. 1021 (IPR2025-01068, Paper No. 10), 58 (“[a]fter decoding the image data, Kim’s controller uses the IAD in the image data, e.g. to ‘detect[] the address of the corresponding I-picture frame’ *if the image data is a P-picture.*”) (emphasis added).

Thus, no matter what type of image frame is selected for decoding by the user, the IAD *of the I-frame* (the alleged “indication” in the Petition) is never read, decoded, or used for anything in Kim. Richardson Decl., ¶¶ 130-37. The image that is decoded first is the image that is selected by the user; there is no indication of any first frame in decoding order coming from the IAD of the I-frame. Richardson Decl., ¶¶ 130-37. In the previous ITC Investigation, Dr. Omid Kia agreed that “[i]t is the user that selects the picture to decode” and not the value of the IAD of the I-frame. Ex. 2013 (1380 Public Tr.), 23-24 (1730:10-1731:2). Therefore, the IAD of the I-frame cannot be “an *indication* of at least one image frame, which is *the first image frame, in decoding order*, of the independent sequence.”

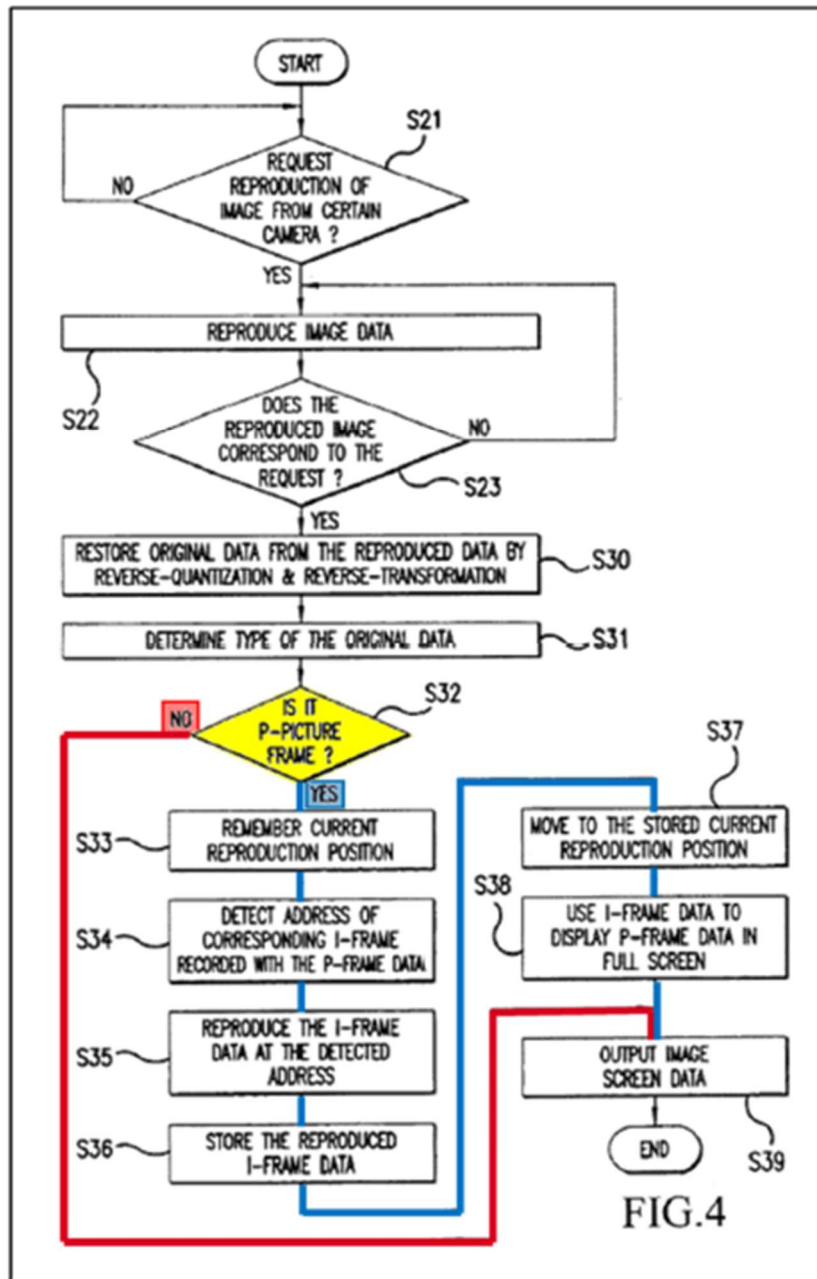
That there may, out of happenstance, be an occasion where an I-frame was selected by a user to be decoded first, and the IAD of that I-frame has a zero value, does not transform that IAD value into an indication of anything. It is still unrebutted that there are no steps in the encoding or decoding process of Kim that ever uses the

IAD *of the I-frame* to indicate an image frame to decode first. Richardson Decl., ¶¶ 130-37.

Neither the Petition nor its expert, Dr. Havlicek, address this critical flaw in Kim. Nor does the Petition or Dr. Havlicek assert that there would be any motivation to modify Kim in any way to make the IAD of the I-frame have a corresponding meaning or make it an “indication” as required by the claims. For this additional reason, Kim cannot disclose or render obvious any of the decoding claims 8-11 of the ’321 Patent.

**c) Kim’s IAD of the I-frame is never “decode[d] from the video sequence.”**

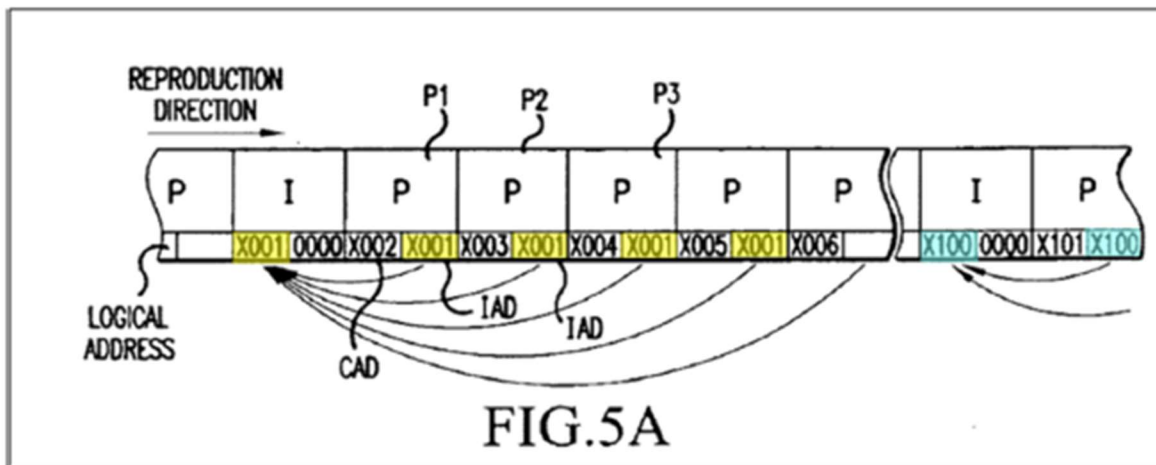
A third reason Kim does not disclose or render obvious the decoding claims is that the IAD of the I-frame is never decoded, as required by the claims. As explained above, the Petitioners, Dr. Havlicek, and Dr. Richardson all agree that when an I-frame is selected by the user to decode, the decoding process *skips* the Step S34 that detects the IAD. Pet., 10-11; Ex. 1003 (Havlicek Decl.), ¶ 59; Richardson Decl., ¶ 142. The Step S34 to detect the IAD is only performed when a P-frame is selected. Therefore, the IAD *of the I-frame* (the alleged “indication”) is never decoded. Richardson Decl., ¶ 142.



Ex. 1003 (Havlicek Decl.), ¶ 59 (Ex. 1006 (Kim), Fig. 4 (annotations added).

Although Dr. Havlicek describes and shows in his own annotated Figure 4 that Kim’s decoder does not detect the IAD for the I-frame, he nevertheless concludes that a “POSITA would have understood that the decoder disclosed in Kim

decodes the IAD of the image frames.” Ex. 1003 (Havlicek Decl.), ¶ 123. He cites to Figure 5A to state that a “POSITA would have understood that decoding the bitstream in Figure 5A would include decoding the components of that bitstream, including the IAD values.” Ex. 1003 (Havlicek Decl.), ¶ 123.



Ex. 1003 (Havlicek Decl.), ¶ 122 (Ex. 1006 (Kim), Fig. 5A (annotations added).

However, Dr. Havlicek’s opinions are not supported by the figure or the description in Kim. Figure 5A, shown above, does not include any arrows that point to or from the IAD of the I-frame. Rather, a POSITA would understand that Figure 5A is consistent with Figure 4 and the description in the specification that the decoding process of Kim never includes decoding the IAD of the I-frame but rather only decodes the IAD of the P-frame (which points to the CAD of the I-frame). Richardson Decl., ¶¶ 143-44.

As explained previously, it is also the case when the user selects a P-frame to decode that the IAD of the I-frame is not decoded. The annotated Figure 4 above,

and the description in Kim’s specification, show that when the user selects a P-frame, only the IAD *of the P-frame* is decoded, not the IAD *of the I-frame*. Ex. 1006 (Kim), 5:66-6:3; Pet., 10-11; Ex. 1003 (Havlicek Decl.), ¶ 59; Richardson Decl., ¶ 142.

Neither the Petition nor Dr. Havlicek assert that there would be any motivation to modify Kim in any way to include decoding the IAD of the I-frame. For this additional reason, Kim cannot disclose or render obvious any of the decoding claims 8-11 of the ’321 Patent.

**d) Kim does not have a “video sequence.”**

A fourth reason Kim does not disclose or render obvious the decoding claims is that Kim does not disclose or render obvious “decoding from the *video sequence*.” For the same reasons as explained above for the encoding claims, Kim expressly teaches decoding a single image when it states that “only the desired images can be selectively reproduced with high display quality.” Ex. 1006 (Kim), 6:17-20. Thus, Kim teaches the select encoding and decoding of individual images at a time, and not the video sequence of the ’321 Patent. Richardson Decl., ¶ 148.

Again, neither the Petition nor Dr. Havlicek even attempt to explain how decoding of single images in Kim can satisfy a video sequence of claim 8[a], 10[a], or 11[a]. Pet., 31-35, 50, 54; Ex. 1003 (Havlicek Decl.), ¶¶ 117-125, 158, 173. Nor does the Petition or Dr. Havlicek assert any motivation to modify or combine Kim in such a way as meet the “video sequence” of claim 8[a], 10[a], or 11[a].

To the extent that the Petitioners and Dr. Havlicek assert that a POSITA would have found it obvious “to apply Kim’s Figure 4 process to Kim’s Figure 5A video data rather than a single image,” with respect to claim 8[b], both in any event fail to support such an assertion with any evidence or rationale. Pet., 36-37; Ex. 1003 (Havlicek Decl.), ¶ 128. Dr. Havlicek first points to the ’321 Patent itself for motivation, which is classic impermissible hindsight to use the patent as a roadmap for alleging obviousness. Ex. 1003 (Havlicek Decl.), ¶ 128. *TQ Delta, LLC v. Cisco Sys.*, 942 F.3d 1352, 1361 (Fed. Cir. 2019) (“We repeatedly expressed concerns that crediting such testimony risks allowing the challenger to use the challenged patent as a roadmap to reconstruct the claimed invention”). Dr. Havlicek then points to a Sony Time Lapse VCR and concludes, without reasoning or explanation, that “a POSITA would have appreciated the practical importance of that capability to time lapse video applications.” Ex. 1003 (Havlicek Decl.), ¶ 128. Dr. Havlicek, however, fails to explain what that “practical importance” might be. To the extent he means it “would have been impractical to require users to select video frames one by one that were captured over an extended period,” he fails to provide any reason why a user reading Kim would want to do that. Ex. 1003 (Havlicek Decl.), ¶ 61; Richardson Decl., ¶¶ 150-54. Kim expressly teaches that “only the desired images can be selectively reproduced with high display quality.” Ex. 1006 (Kim) at 6:17-20. Therefore, Dr. Havlicek’s opinion directly contradicts the teachings of Kim.

A POSITA, in fact, would not have been motivated to modify Kim’s decoding process to repeat itself over and over again for all of the image frames in view of Kim’s express teaching to decode only single selected images. Ex. 1006 (Kim), 6:17-20; Richardson Decl., ¶¶ 150-54. A POSITA would have understood that modifying Kim to repeatedly decode images into a video sequence would have required more effort, processing power, memory, and cost. Richardson Decl., ¶¶ 150-54. Such a scheme would not have been efficient and necessary for the applications that Kim targeted, which only need individual time lapse images rather than a video sequence. Ex. 1006 (Kim), 1:14-20; Richardson Decl., ¶¶ 150-54.

Dr. Havlicek at most establishes that “the decoding steps in Figure 4 *can be* repeated for each image in an independent sequence.” Ex. 1003 (Havlicek Decl.), ¶ 129 (emphasis added). But that is not legally sufficient to establish that a POSITA *would have* been motivated to do so, as required for an obviousness inquiry. *Auris Health, Inc. v. Intuitive Surgical Operations, Inc.*, 32 F.4th 1154, 1158 (Fed. Cir. 2022) (“The motivation-to-combine inquiry asks whether a skilled artisan ‘*not only could have* made but *would have* been motivated to make the combinations . . . of prior art to arrive at the claimed invention.’”) (emphasis added).

Therefore, a POSITA would not have been motivated to modify Kim to decode a video sequence, as that is the opposite of what Kim teaches.

**3. Decoding claims – Petitioner fails to demonstrate that Kim discloses or renders obvious claims 8[b], 10[b], and 11[b].**

Each of the independent decoding claims requires “*start[ing] the decoding* of the video sequence *from said first image frame* of the independent sequence,” which is identified as 8[b], 10[b], and 11[b] in the Petition. Pet., Listing of Challenged Claims.

The key piece of this limitation that is never addressed by either the Petition or Dr. Havlicek is that “said first image frame” in 8[b] must be “*the* first image frame” that was identified by the “indication” of 8[a], 10[a], and 11[a]. *E.g.*, ’321 Patent, claim 8[a] (“an *indication* of at least one image frame, which is *the first image frame, in decoding order*, of an independent sequence” (emphasis added)). As explained above with respect to 8[a], 10[a], and 11[a], the decoding of an image frame in Kim has nothing to do with the IAD of the I-frame but is instead simply the image frame that is selected by the user. *See supra* Section III.A.2.b.

As explained above, if the user selects an I-frame to decode, Kim’s decoder decodes the I-frame without ever reading the IAD of the I-frame and therefore without regard to the image frame being “said image frame” from any indication in the bitstream. Ex. 1006 (Kim), 5:13-34, 5:66-6:3, Fig. 4; Richardson Decl., ¶¶ 156-60; Pet., 10-11; Ex. 1003 (Havlicek Decl.), ¶ 59. Likewise, if the user selects a P-frame to decode, Kim’s decoder decodes the P-frame without ever reading the IAD

of the I-frame and therefore without regard to the image frame being “said image frame” from any indication in the bitstream. Ex. 1006 (Kim), 5:13-65, Fig. 4; Richardson Decl., ¶¶ 156-60; Pet., 10-11; Ex. 1003 (Havlicek Decl.), ¶ 59.

Therefore, even if the IAD of the I-frame somehow was the claimed “indication” of claims 8[a], 10[a], and 11[a], Kim’s actual decoding process does not start decoding “from said first image frame” because it simply starts decoding from whatever frame that the user selected. Richardson Decl., ¶¶ 156-60; Ex. 2013 (1380 Public Tr.), 23-24 (1730:10-1731:2).

**4. Decoding claims – Petitioner fails to demonstrate that Kim discloses or renders obvious claims 8[d], 10[d], and 11[d].**

Each of the independent decoding claims requires “resetting[/reset] the identifier value for the indicated first image frame of the independent sequence,” which is identified as 8[d], 10[d], and 11[d] in the Petition. Pet., Listing of Challenged Claims. Petitioners assert that the IAD of the I-frame is reset to zero for each I-frame in Figure 5A of Kim. Pet., 45.

As a preliminary matter, Petitioners appear to suggest that claims 8[d], 10[d], and 11[d] do not need to be performed by the *decoder* and can be satisfied by the *encoder*. Pet., 45-46 (“Patent Owner argued that the claim language requires the *decoder* to do the resetting whereas Kim discloses that the Temporal Reference for the first picture in the GOP is set by the *encoder*. But to the extent Patent Owner

suggests that the claimed “resetting” step requires the decoder to modify the identifier assigned by the encoder, the ’321 patent provides no support for that interpretation.”). Claim 8 is a “method for *decoding*.” Claim 10 is a “video *decoder* . . . configured to . . . cause the video *decoder* to *decode*.” Claim 11 is a “computer program products ... for *decoding*.” In the previous ITC Investigation, the experts on both the patent owner side and challenger side agreed that the resetting steps in claims 8 and 11 had to be performed by the decoder. Ex. 2013 (1380 Public Tr.), 5 (601:8-10 (“Q: According to the claims, what has to perform the resetting step? A: The decoder.”)), 12-13 (1065:12-1066:3 (“Q: It would not meet the claim limitation to just read a value that was reset by an encoder, because the claim requires that the resetting be done by the decoder, right, sir? A: That’s correct.”)), 25 (1732:15-18). There is simply no serious dispute that elements 8[d], 10[d], and 11[d] must be performed by the *decoder* and not the *encoder*. See ’321 Patent, 11:26-30.

That distinction is dispositive. Kim fails to disclose or render obvious that the IAD of the I-frame is ever reset by the *decoder*. In fact, Kim’s Figure 5A, on which Petitioners rely, shows “logical data structure of a digital data stream *compressed and recorded* on the optical disk” by Kim’s *encoder*, not its decoder. Ex. 1006 (Kim), 2:49-51 (emphasis added). Kim makes clear that the IAD values are generated by and then received from the *encoder*. Ex. 1006 (Kim), 4:34-45 (“the address of the I-picture data received from the encoder 110”), Fig. 3.

Furthermore, both the Petition and Dr. Havlicek admit that a “POSITA would have understood that the *encoder* disclosed in Kim *encodes* the IAD of the image frames.” Pet., 17 (emphasis added); Ex. 1003 (Havlicek Decl.), ¶ 72. And, Dr. Havlicek further admits, “a POSITA would know that [a decoder] does not change the image number *set by the encoder*” and that “a POSITA would not expect a decoder to receive an identifier value set by the encoder and then modify that value.” Ex. 1003 (Havlicek Decl.), ¶ 149 (emphasis added).

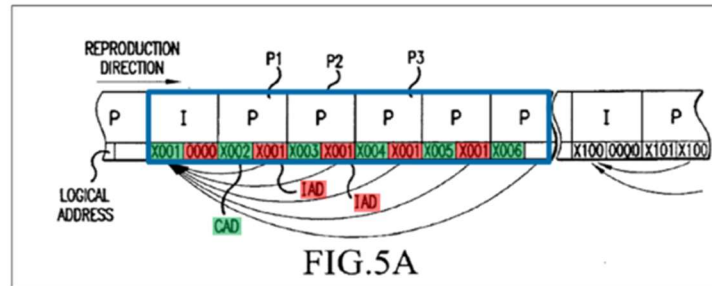
There is simply nowhere in Kim that discloses or suggests that the *decoder* ever sets or resets the IAD of the I-frame. Richardson Decl., ¶¶ 162-83. The Petition’s naked conclusion that a “POSITA would have understood that, consistent with the disclosure of the ’321 patent itself, Kim’s decoder resets the identifier for the first image frame (an I-frame) of the exemplary closed GOP during decoding” does not even include a supporting citation of any kind. Pet., 47. And although that verbatim sentence appears in Dr. Havlicek’s Declaration, he offers no reasoning, explanation, or evidence to support such an opinion. Ex. 1003 (Havlicek Decl.), ¶ 150. Dr. Havlicek’s conclusory opinion without more should be entitled to no weight.

Rather than Kim actually disclosing the limitation, both the Petition and Dr. Havlicek seem to admit that their theory is really that “Kim’s decoder stores I-pictures in frame memory 101 for use in decoding subsequent P-pictures” and

therefore it “would have been *obvious* to a POSITA for Kim’s decoder to *store the IAD* along with the I-picture so the decoder could determine whether the I-picture needed to decode a given P-picture is already present in frame memory.” Pet., 47; Ex. 1003 (Havlicek Decl.), ¶ 150 (emphasis added).

However, it would not have been obvious to store the IAD value of the I-frame because that value is not used to “determine whether the I-picture needed to decode a given P-picture is already present in frame memory,” as Dr. Havlicek incorrectly suggests. Richardson Decl., ¶¶ 171-72. Indeed, both the Petition and Dr. Havlicek already agreed that it is the *CAD value* of the I-frame that is needed to decode a given P-frame, not the *IAD* value they now point to. Pet., 10 (“I-pictures also have a CAD that indicates the picture’s current address” and showing arrows from the P-frame pointing to the *CAD value* of the I-frame, not the IAD value, which has no arrows pointing to it).

52.) I-pictures also have a CAD that indicates the picture's current address (EX1006, 4:65-5:1, Figs. 5A, 6 (“physical address”)), but the I-picture's IAD is zero (EX1006, Figs. 5A (showing “0000”), 6 (showing “00000000” for the “corresponding I-Picture address”)). Figure 5A below is annotated to highlight the IAD values in red and CAD values in green.



Pet., 10 (colors and annotations in original); Ex. 1003 (Havlicek Decl.), ¶ 58.

As Dr. Richardson explained, there is no meaning or use for the *IAD* of the I-frame, and Dr. Havlicek fails to offer any explanation why the *IAD* would be obvious to store when it is never used. Richardson Decl., ¶¶ 171-72. Dr. Havlicek's only suggested reasoning would apply to the *CAD value* not the *IAD value*. Richardson Decl., ¶¶ 171-72. Storing a value that has no meaning and has no use would waste valuable time, memory, processing power, and resources, and a POSITA would not have been motivated to do so. Richardson Decl., ¶¶ 172-74. In the previous ITC Investigation, Dr. Omid Kia similarly testified that “[f]or an I-frame, that *IAD* does not serve any purpose ... So it would not be obvious to add functionality that was not there.” Ex. 2013 (1380 Public Tr.), 25-26 (1732:19-1733:9).

Moreover, even if it were obvious to store the value of the IAD of the I-frame (which it is not), merely storing a value at the decoder that was set or reset at the *encoder* would not satisfy the claims, which on their face require the resetting to be done by the *decoder*. Richardson Decl., ¶¶ 174-83. Not only do the claims require the decoder to perform the resetting, the '321 Patent specification explains that “when activated at a random point, the *decoder preferably sets* the identifier of the first image frame, preferably an I-frame, of the independently decodable sub-sequence.” '321 Patent, 11:26-40 (emphasis added). Both the Petition and Dr. Havlicek quote this passage. Pet., 46; Ex. 1003 (Havlicek Decl.), ¶ 149. Therefore, Petitioner and its own expert show that the Petition is wrong to state “the only time that the patent describes ‘reset[ting]’ the identifier value . . . it is referring to an *encoding* process.” Pet., 46 (emphasis in original).

Indeed, in the previous ITC Investigation, the expert for the patent challenger, Dr. Eli Saber, testified that it “would not meet the claim limitation to just read a value that was reset by an encoder, because the claim requires that the resetting be done by the decoder.” Ex. 2013 (1380 Public Tr.), 12-13 (1065:19-1066:3). Dr. Saber then presented the same arguments as this Petition regarding how Fig. 5A shows the IAD value of the I-frame resetting. Ex. 2013 (1380 Public Tr.), 10 (1038:3-18). And, in response, Dr. Omid Kia explained, just as Dr. Richardson does now, that Kim’s Figure 5A and other teachings are related to the *encoder*, in contrast

to the claims, which require the *decoder* perform the resetting. Ex. 2013 (1380 Public Tr.), 25-26 (1732:11-1733:9); Richardson Decl., ¶¶ 174-83.

Therefore, Dr. Havlicek is wrong that “[n]othing in the ’321 patent, as it would have been understood by a POSITA, requires the decoder to change the identifier value assigned during encoding for the first frame in the sequence.” Ex. 1003 (Havlicek Decl.), ¶ 150. Dr. Havlicek’s opinion contradicts the express language of the claims and the description in the specification, which he himself quotes. ’321 Patent, 11:26-40; Ex. 1003 (Havlicek Decl.), ¶ 149.

When the same arguments that Petitioners and Dr. Havlicek advance now were considered in the previous ITC proceeding, the ALJ correctly concluded that “claims 8 and 10 require the decoder, not the encoder, to perform the resetting step.” Ex. 2009 (1380 Public ID), 62. And when considering the same argument advanced here “that the decoder reading a ‘reset’ value from a bitstream and storing it locally meets the resetting limitation,” the ALJ correctly concluded “[t]here is really no dispute that . . . the alleged ‘identifier value’ in Kim is set/reset by the encoder and the decoder simply reads or derives it from the bitstream,” and therefore “Kim does not teach a decoder resetting the IAD value.” Ex. 2009 (1380 Public ID), 62-63 (also rejecting that Kim rendered obvious the ’321 Patent).

The reason why, in the ’321 Patent, the decoder resets the identifier is so that the decoder can define a point to start decoding the video when a user selects a

random access point. '321 Patent, 11:26-40 (“[T]his [random access problem] can be avoided in the decoder by defining an initiation image in an independently decodable Group of Pictures GOP that is activated at the random point of the video file, and the number of the initiation image is set to zero .... Consequently, when activated at a random point, the *decoder preferably sets* the identifier of the first image frame, preferably an I-frame, of the independently decodable sub-sequence.”) (emphasis added); Richardson Decl., ¶ 179. Kim has no reason to teach or suggest the solution of the '321 Patent because Kim has nothing to do with random access during streaming video. Kim’s single image reproduction for a time lapse recording on an optical disk is not related to the same problem or solution of the '321 Patent.

Therefore, the Board should conclude, just as the ALJ did in the previous ITC Investigation, that Kim does not teach or render obvious the claims of the '321 Patent for all the reasons explained above.

**B. Petitioners Have Not Established a Reasonable Likelihood That The Challenged Claims 2, 5, 9 Are Unpatentable in Light of Ground 2—Kim and Adolph.**

Dependent claims 2, 5, and 9 all depend from the independent claims discussed above with respect to Ground 1. Petitioners do not advance that the secondary reference Adolph overcomes any of the shortcomings of the primary reference Kim with respect to any of the independent claims of Ground 1. Therefore, Ground 2 fails to establish a reasonable likelihood that dependent claims 2, 5, and 9

are unpatentable because Ground 1 already fails to establish a reasonable likelihood that the independent claims are unpatentable over Kim.

#### **IV. CONCLUSION**

For any or all the above-described reasons, Nokia respectfully requests that the Board deny institution.

Dated: October 7, 2025

Respectfully submitted,

By: /Nicholas T. Tsui/  
Nicholas T. Tsui  
Reg. No. 71,055

**CERTIFICATION OF WORD COUNT**

The undersigned hereby certifies that the portions of the above-captioned **PATENT OWNER'S PRELIMINARY RESPONSE** specified in 37 C.F.R. §42.24 have 12,356 words, in compliance with the 14,000 word limit set forth in 37 C.F.R. §42.24(b)(1). This word count was prepared using Microsoft Word.

Dated: October 7, 2025

Respectfully submitted,

By: /Nicholas T. Tsui/  
Nicholas T. Tsui  
Reg. No. 71,055

**CERTIFICATE OF SERVICE**

Pursuant to 37 C.F.R. §42.6(e), the undersigned hereby certifies that true and correct copies of the above-captioned **PATENT OWNER'S PRELIMINARY RESPONSE and NOKIA EXHIBITS 2012-2014** were served in their entirety on October 7, 2025 via filing through the Patent Trial and Appeal Case Tracking System (P-TACTS) and electronic mail on the following counsel of record for Petitioner:

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