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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

RIVERBED TECHNOLOGY, INC.; DELL INC.; HEWLETT-PACKARD ENTERPRISE CO.; HP ENTERPRISE SERVICES, LLC; TERADATA OPERATIONS, INC.; ECHOSTAR CORPORATION; and HUGHES NETWORK SYSTEMS, LLC,
Petitioners,

v.

REALTIME DATA LLC,
Patent Owner.

Case IPR2016-00978
Patent 8,643,513 B2

Before BRIAN J. McNAMARA, JASON J. CHUNG, and KEVIN C. TROCK, *Administrative Patent Judges*.

TROCK, *Administrative Patent Judge*.

FINAL WRITTEN DECISION and ORDER
35 U.S.C. § 318(a) and
37 C.F.R. § 42.73

I. INTRODUCTION

A. Background

Riverbed Technology, Inc.; Dell Inc.; Hewlett-Packard Enterprise Co.; HP Enterprise Services, LLC; Teradata Operations, Inc.; Echostar Corporation; and Hughes Network Systems, LLC ("Petitioner") filed a Petition (Paper 10, "Pet.") to institute an *inter partes* review of claims 1–4, 6, 10–16, 18–20, and 22 of U.S. Patent No. 8,643,513 B2 (Ex. 1001, "the '513 patent"). Realtime Data LLC, ("Patent Owner") timely filed a Preliminary Response (Paper 18, "Prelim. Resp."). We instituted an *inter partes* review of claims 1–4, 6, 10–16, 18–20, and 22 of the '513 patent. Paper 24 ("Dec. to Inst."). Patent Owner filed a Patent Owner Response (Paper 34, "PO Resp."), Petitioner filed a Petitioner Reply (Paper 45, "Pet. Reply"), and a hearing was held on July 25, 2017, a transcript of which has been entered into the record (Paper 66, "Hr'g Tr.").

We have jurisdiction under 35 U.S.C. § 6(b). This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a). We base our decision on the preponderance of the evidence. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). Having reviewed the arguments of the parties and the supporting evidence, we find that Petitioner has demonstrated by a preponderance of the evidence that claims 1–4, 6, 10–16, 18–20, and 22 of the '513 patent would have been obvious over the combined teachings of Wang (WO 00/46688, published Aug. 10, 2000 (Ex. 1009)), Matsubara (US 5,838,821, issued Nov. 17, 1998 (Ex. 1010)), and Franaszek (US 5,870,036, issued Feb. 9, 1999 (Ex. 1011)).

B. The '513 Patent

The '513 patent, titled "Data Compression Systems and Methods," discloses systems and methods for analyzing a data block and selecting a

compression method to apply to that block. Ex. 1001, Title, Abst. The '513 patent further discloses "fast and efficient data compression using a combination of content independent data compression and content dependent data compression." *Id.* at 3:55–58. One embodiment of the '513 patent is illustrated in Figure 13A reproduced below.

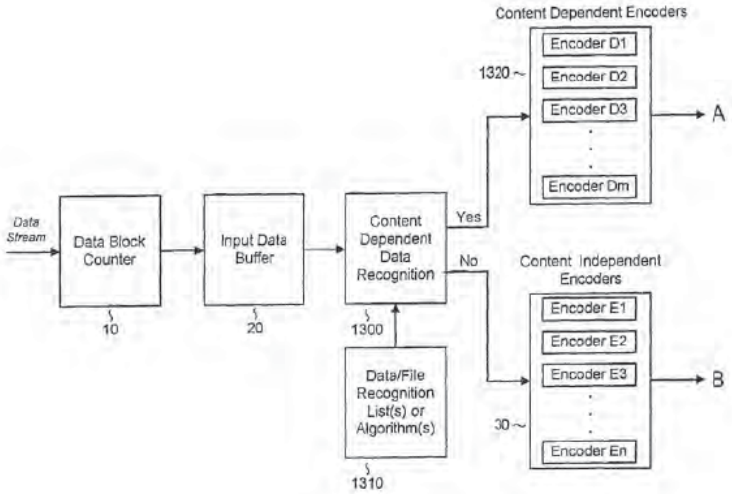

Figure 13A depicts a block diagram of a data compression system. As shown above in Figure 13A of the '513 patent, the system receives an input data stream of data blocks. *Id.* at 15:63–16:5. Content dependent data recognition module 1300 analyzes the incoming data stream to recognize "data types" and other parameters indicative of the "data type/content." *Id.* at 16:15–21. If module 1300 recognizes the data type of a given data block, module 1300 routes the block to content dependent encoder module 1320 (*id.* at 16:24–26); if not, it routes the block to "content independent" (or "default") encoder module 30 (*id.* at.3:66–67, 4:30–35, 15:56–63, 16:26–27, 18:17–25).

Content dependent encoder module 1320 comprises lossy or lossless compression encoders (*id.* at 16:28–37); content independent encoder module 30 comprises only lossless encoders (*id.* at 16:43–50). Lossy

encoders provide for an "inexact" representation of the original uncompressed data (Ex. 1001, 2:4–7); lossless encoders provide for an "exact" representation (*id.* at 2:18–20). The '513 patent teaches that "[e]ncoding techniques" may be selected "based upon their ability to effectively encode different types of input data." *Id.* at 12:54–56.

Another embodiment of the '513 patent is illustrated in Figure 13B reproduced below.

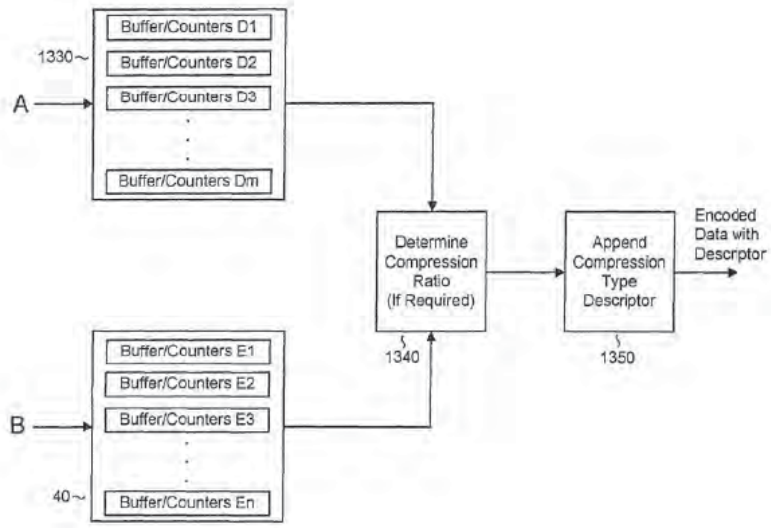

Figure 13A depicts a block diagram of a data compression system. As shown above in Figure 13B of the '513 patent, "compression ratio module 1340, operatively connected to the content dependent output builder/counters 1330 and content independent buffer/counters 40 determines the compression ratio obtained for each of the enabled encoders and[/]or El . . . En." *Id.* at 17:28–42. The compression ratio is set "by taking the ratio of the size of the input data block to the size of the output data block stored in the corresponding buffer/counters BCD1, BCD2, BCD3 . . . BCDm and[/]or BCE1, BCE2, BCE3 . . . BCEn." *Id.* at 17:39–42.

C. Challenged Claims

As noted above, Petitioners challenge claims 1–4, 6, 10–16, 18–20, and 22 of the '513 patent, of which claims 1 and 15 are the only independent claims. Claim 15 is similar to claim 1, except that claim 15 is an apparatus claim reciting circuits configured to execute essentially similar limitations as claim 1. Claims 1 and 15 are illustrative and are reproduced below (with paragraphing added):

> 1. A method of compressing a plurality of data blocks, comprising:
>
> analyzing the plurality of data blocks to recognize when an appropriate content independent compression algorithm is to be applied to the plurality of data blocks;
>
> applying the appropriate content independent data compression algorithm to a portion of the plurality of data blocks to provide a compressed data portion;
>
> analyzing a data block from another portion of the plurality of data blocks for recognition of any characteristic, attribute, or parameter that is indicative of an appropriate content dependent algorithm to apply to the data block; and
>
> applying the appropriate content dependent data compression algorithm to the data block to provide a compressed data block when the characteristic, attribute, or parameter is identified,
>
> wherein the analyzing the plurality of data blocks to recognize when the appropriate content independent compression algorithm is to be applied excludes analyzing based only on a descriptor indicative of the any characteristic, attribute, or parameter, and
>
> wherein the analyzing the data block to recognize the any characteristic, attribute, or parameter excludes analyzing based only on the descriptor.

Ex. 1001, 26:21–46.

> 15. A device for compressing data comprising:

> a first circuit configured to analyze a plurality of data blocks to recognize when an appropriate content independent compression algorithm is to be applied to the plurality of data blocks;
>
> a second circuit configured to apply the appropriate content independent data compression algorithm to a portion of the plurality of data blocks to provide a compressed data portion;
>
> a third circuit configured to analyze a data block from another portion of the plurality of data blocks for recognition of any characteristic, attribute, or parameter that is indicative of an appropriate content dependent algorithm to apply to the data block; and
>
> a fourth circuit configured to apply the appropriate content dependent data compression algorithm to the data block to provide a compressed data block when the any characteristic, attribute, or parameter is identified,
>
> wherein the first circuit is further configured to analyze the plurality of data blocks to recognize when the appropriate content independent compression algorithm is to be applied by excluding analyzing based only on a descriptor indicative of the any characteristic, attribute, or parameter, and
>
> wherein the third circuit is further configured to analyze the data block to recognize the any characteristic, attribute, or parameter by excluding analyzing based only on the descriptor.

Id. at 27:32–28:19.

II. DISCUSSION

A. Claim Construction

Claim terms in an unexpired patent are interpreted according to their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); *see Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) ("We conclude that the regulation represents a reasonable exercise of the rulemaking authority that Congress

delegated to the Patent Office."). Under that standard, and absent any special definitions, we give claim terms their ordinary and customary meaning, as would be understood by one of ordinary skill in the art at the time of the invention. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

Petitioners propose constructions for "data blocks," "content independent compression algorithm," and "content dependent compression algorithm." Pet. 13–17. In the Preliminary Response, Patent Owner indicated that Petitioner's proposed claim constructions were "irrelevant to the contested issues," and that "Patent Owner does not, at this time, take a position on Petitioner's constructions." Prelim. Resp. 9. In the Decision to Institute, we did not construe expressly any claim terms at that stage of the proceeding. Dec. to Inst. 8. Patent Owner's Response did not address Petitioner's proposed claim constructions substantively. *See* PO Resp. 9.

We construe only those claim terms that require analysis to conduct our review. *See Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (holding that "only those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy"). For the reasons discussed herein, we determine that our analysis does not require the express construction of any claim terms.

B. Level of Ordinary Skill in the Art

In determining whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham*, 383 U.S. at 17. "The importance of resolving the level of ordinary skill in the art lies in the necessity of

maintaining objectivity in the obviousness inquiry." *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991).

Petitioners' Declarant, Dr. Creusere, opines that a person of ordinary skill in the art relevant to the '513 patent, and in the time period around 2001, would have been a person with "at least a bachelor's degree in computer science, computer engineering, electrical and computer engineering, electrical engineering, or electronics and at least two years of experience working with data compression or a graduate degree focusing in the field of data compression." Ex. 1013 ¶ 25. Patent Owner does not offer any alternative explanation regarding who would qualify as a person of ordinary skill in the art relevant to the '513 patent.

Based on our review of the '513 patent, the types of problems and solutions described in the '513 patent and cited prior art, and the testimony of Petitioners' Declarant, we adopt and apply Dr. Creusere's definition of a person of ordinary skill in the art at the time of the claimed invention for purposes of this Decision. We also note that, in this case, the applied prior art reflects the appropriate level of skill at the time of the claimed invention. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001).

C. Overview of the References

1. Wang

Wang is titled "Intelligent Method for Computer File Compression." Ex. 1009, Title. Wang teaches automatically compressing computer files containing different information types—such as text, image, and sound—using suitable lossy or lossless compression techniques. *Id.* at Abst. Wang explains that "[t]he method of the present invention may be used in any computer hardware and/or software system, such as in modem software or

an e-mail system." *Id.* at 3. One embodiment of Wang is shown in Figure 1, reproduced below.

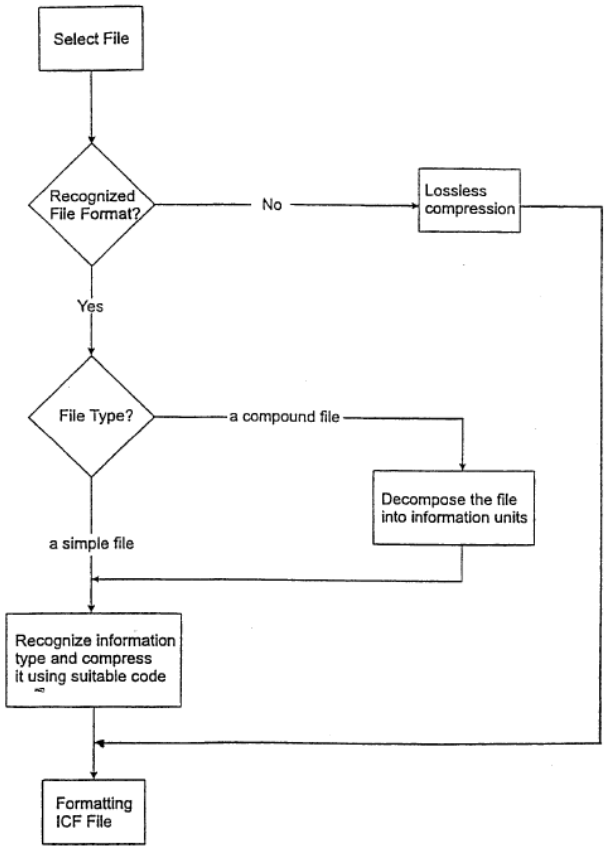

Figure 1 depicts in flow chart form a method for compressing a computer file.

Wang specifically teaches analyzing a file's (1) extension name and (2) control information to identify its file format. Ex. 1009, 4. If the file format is identified, then Wang determines whether the file is a simple file (i.e., contains only a single data type, such as text, bitmap, wave, etc.) or a compound file (i.e., contains more than one type of data). *Id.* If the file is a simple file, Wang automatically recognizes its data type and automatically compresses the file using a compression algorithm suitable for that data type. *Id.* For example, Wang describes that "a lossless code, such as LZW, may be used for compression of character information," and a "lossy code,

such as JPEG or G.723, may be used for compression of image or audio information." *Id*. If the file is a compound file, Wang teaches to automatically decompose the file into a plurality of units each containing only a single type of data. *Id.* at 5. According to Wang, each unit is then compressed using a compression algorithm suitable for the type of data in the same manner as a simple file. *Id.*

Wang further teaches that if a file format cannot be identified or recognized by analyzing the file's extension name and control information, then the file is compressed with a default lossless compression algorithm, such as an LZW lossless compression algorithm. *Id*. at 4.

2. Overview of Franaszek

Franaszek teaches systems and methods for compressing and decompressing data blocks using a plurality of optimal encoders. Ex. 1011, Abst. Franaszek teaches that representative samples of each block are tested to select an appropriate encoder to apply to the block. *Id.* Franaszek teaches recognizing the data type of incoming data blocks and then compressing the collection of data blocks using a plurality of optimal encoders for the different types of data. *Id*. at 4:30–36, 5:49–53.

In one embodiment, Franaszek teaches a set of "default" compression algorithms, which are shown in Figure 2, reproduced below.

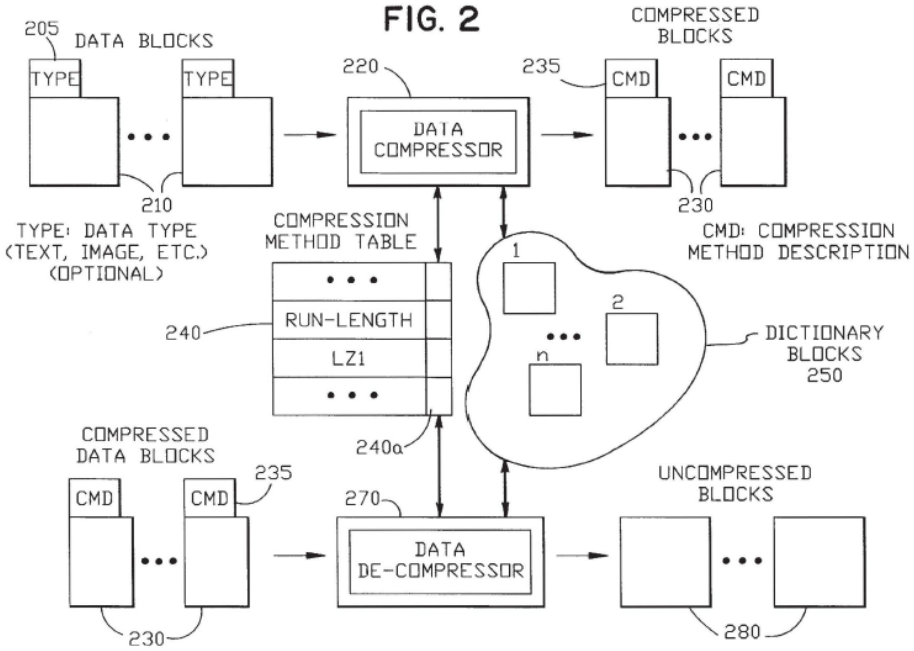

Figure 2 depicts a data compressor and de-compressor. Figure 2, above, illustrates data compressor 220 and data de-compressor 270, with uncompressed data blocks 210 that can contain type information 205. Ex. 1011, 4:25–31. According to Franaszek, the type information can be, for example, image data encoded in a given format, source code for a given programming language, etc. *Id.* at 4:32–34. Data blocks 210 are input to data compressor 220. Data compressor 220 and data de-compressor 270 share compression method table 240 and memory 250 containing a number of dictionary blocks. *Id.* at 4:34–38. Compressor 220 selects a compression method to compress the data. *Id.* at 4:52–53. The compressor outputs compressed data blocks 230, with an index identifying the selected compression method. *Id.* at 4:55–57. Decompressor 270 decompresses the block using the specified method found in compression method table 240 (using the compression method identifier as an index), and outputs uncompressed data blocks 280. *Id.* at 5:1–7. For example, compression

method table 240 is shown in Figure 2 implementing a Lempel-Ziv compression method (LZ1).

Figure 4A of Franaszek is reproduced below.

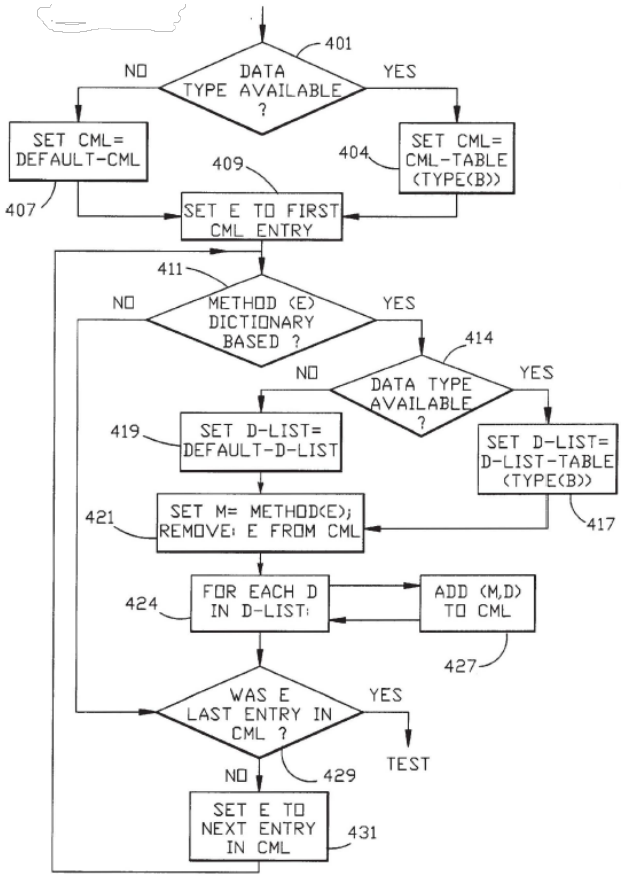

Figure 4A depicts a flow chart showing the operation of data compressor 220 illustrated in Figure 2. As shown in Figure 4A, in step 401 when data compressor 220 receives an uncompressed data block, it first determines whether data "type" information (e.g., text, image, etc.) is available for the data block. Ex. 1011, 5:49–50. If such information is available, then at step 404, the compression method list (CML) is set to a list of compression methods that have been preselected for that data type. *Id.* at 5:50–53. Otherwise, if no data type is available, in step 407 the CML is set to a default list of compression methods. *Id.* at 5:53–54. In instances when the

data "type" information is available, then data compressor 220 uses the compression method "table" 240 shown in Figure 2. *See id.* at 5:49–53.

3. Matsubara

Matsubara is titled "Method and Apparatus for Selecting Compression Method and for Compressing File Using the Selected Method." Ex. 1010, Title. Matsubara teaches a method for automatically selecting a data compression method based on the characteristics of a file to be compressed. *Id.* at Abst., 1:9–14, 1:45–2:36, 3:46–4:21. In particular, Matsubara teaches analyzing a histogram of a file's byte patterns to identify the file's data type. *Id.* at 1:55–2:36. Based on the file's data type, it selects a compression algorithm associated with the data type. *Id.* For example, Matsubara explains that if the values of a histogram of the file's byte patterns are above a certain threshold and arranged around a central portion, then the file is an image file. *Id.* at 2:21–30. If the file is an image file, according to Matsubara, the gradation of the byte patterns is further examined to determine if the file should be compressed using JPEG or JBIG compression. *Id.* at 2:30–36. Matsubara further teaches that for some file types—such as font files, executable files, and text files—the compression technique must be completely reversible or lossless. *Id.* at 4:10–16. To this end, Matsubara explains that a lossless Lempel-Ziv compression encoder can be used. *Id.* at Abst., 6:5–13, 6:59–63, 7:32–34.

Matsubara teaches that "[t]his invention may be conveniently implemented using a conventional general purpose digital computer or microprocessor programmed according to the teachings of the present specification" or "by the preparation of application specific integrated circuits, including one or more programmable logic arrays or by

interconnecting an appropriate network of conventional component circuits, as will be readily apparent to those skilled in the art." *Id.* at 8:28–40.

D. Analysis

1. Cited Art as Applied to the Challenged Claims

Because Petitioner has the burden of proof (see 35 U.S.C. § 316(e), 37 C.F.R. § 42.20(c)), we begin with Petitioner's arguments. Petitioner contends that the combined teachings of Wang, Matsubara, and Franaszek would have rendered each of claims 1–4, 6, 10–16, 18–20, and 22 in the '513 patent obvious to a person of ordinary skill in the art ("POSITA") at the time of the invention. Pet. 22–42.

Petitioner contends that it would have been obvious to a person of skill in the art to combine Matsubara's method of identifying a file's data type in Wang's method for automatically compressing computer files because the combination (a) would have been the use of a known technique to improve a similar method in the same way, (b) would have been a simple substitution of one known element (Wang's technique for automatically recognizing the data type) for another (Matsubara's technique for automatically recognizing the data type) to obtain predictable results, (c) was suggested by Wang's express teaching to automatically recognize the type of data in a file, and (d) would have been obvious to try because Matsubara's method of identifying the type of data in a file was one of a finite number of identified, predictable solutions for automatically recognizing the type of data in a file. Pet. 24 (citing Ex. 1013 ¶¶ 72–81).

Petitioner further contends it would have been obvious to a person of ordinary skill in the art to implement Franaszek's technique of appending a recognizable data token indicative of a content dependent data compression

algorithm applied to the data in Wang's method for automatically compressing computer files because the combination would have been (a) the use of a known technique to improve a similar method in the same way, and (b) combining prior art elements according to known methods to yield predictable results. *Id.* at 30 (citing Ex. 1013 ¶¶ 103–110).

Petitioner supports its position with the Declaration of Dr. Creusere, who testifies that a person of skill in the art would have had reason to combine Wang and Matsubara, because use of an identification technique (such as that taught by Matsubara) in Wang's method for automatically compressing computer files is suggested by Wang's teaching to recognize automatically the data type in a file. Ex. 1013 ¶ 77. For the same reason, Dr. Creusere also testifies that a skilled artisan would have found it obvious to try Matsubara's technique for identifying the data type of a file to augment the Wang system. *Id.* ¶ 79. Dr. Creusere also testifies that a POSITA would have been motivated to combine Franaszek's default lossless compression algorithm when a file's data type is not identified or recognized with Wang, because Wang teaches to use a default lossless compression algorithm when a file format is not identified or recognized. *Id.* ¶ 86.

Patent Owner contends that Petitioner's obviousness challenges fail because Petitioner failed to show that Matsubara is combinable with Wang and Franaszek for several reasons. Patent Owner argues that: (1) a POSITA could not use Matsubara to implement Wang's decomposition step 107; (2) there is no evidence as to how a POSITA could or would implement Wang's file type recognition step 106; (3) there is no evidence that a skilled artisan would have been motivated to incorporate Franaszek into Wang's

data type recognition step 108; and (4) Wang does not teach the claimed analysis steps. PO Resp. 15–33.

Having considered all the evidence and the arguments proffered by Petitioner and Patent Owner, we are persuaded by a preponderance of the evidence that Petitioner's proposed combination of Wang, Matsubara, and Franaszek teaches all the limitations of the challenged claims. Accordingly, we address the specific issues disputed by Patent Owner with respect to Petitioner's proposed combination in further detail below.

a. Wang's Decomposition Step 107

Patent Owner argues that a POSITA could not use Matsubara to implement Wang's decomposition step 107. PO Resp. 15–21. Figure 1 of Wang, annotated by Patent Owner to identify the various steps, is shown below.

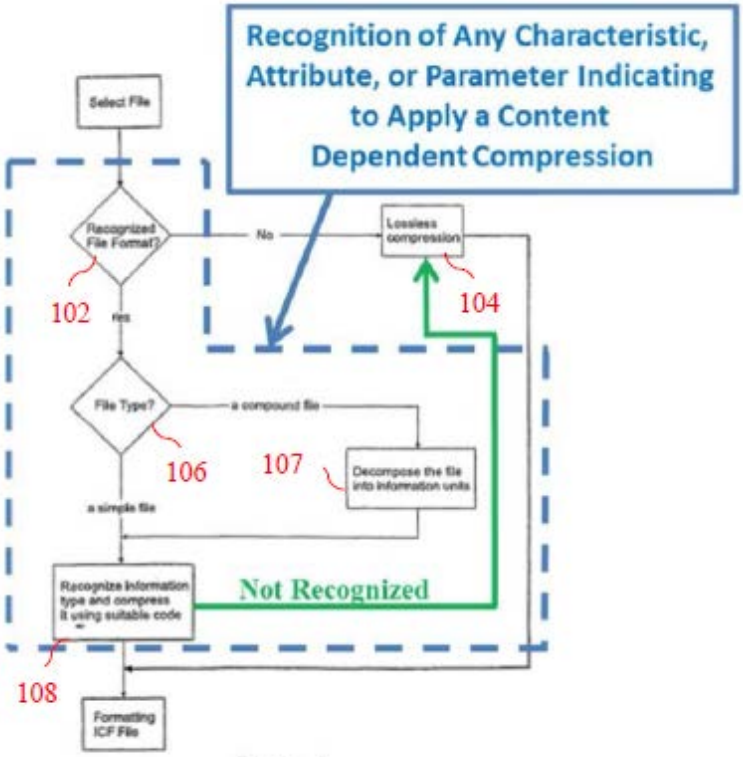

Figure 1 (annotated) of Wang illustrates a method for compressing a computer file. *Id.* at 15.

Patent Owner argues that Dr. Creusere acknowledged during his deposition that Wang does not teach how to perform its step of decomposing a file into single data-type information units. PO Resp. 16 (citing Ex. 2010, 74:13–19, 7:24–8:4, 51:7–10). Patent Owner also argues that Dr. Creusere admitted that Matsubara is not capable of implementing Wang's decomposition step because Matsubara's approach is to recognize a single data type within a "simple" file, not to distinguish between different data types within a compound file. *Id.* at 16–18. Patent Owner argues that because Matsubara's technique cannot and would not decompose Wang's compound files at step 107, a POSITA would not be motivated to pursue that combination. *Id.* at 20–21.

Patent Owner's argument, does not recognize, however, that Petitioner relies on Wang, not Matsubara, as teaching file decomposition step 107. Pet. 34. Petitioner explains that Wang discloses that the file is determined to be either a simple file (i.e., contains only a single data type, such as text, bitmap, wave, etc.) or a compound file (i.e., contains more than one type of data). *Id.* at 36 (citing Ex. 1009, 4). If the file is a compound file, then the file is automatically decomposed into a plurality of units each containing only a single type of data and each unit of a single data type is then compressed using a suitable compression algorithm. *Id.* at 37 (citing Ex. 1009, 5).

Petitioner relies on Matsubara's technique of automatically recognizing the data type for Wang's data recognition step 108, not Wang's file decomposition step 107. *Id.* at 37. Petitioner explains that

> Wang does not explicitly describe how the data type of the file is automatically recognized. But—in the same field of automatically selecting a data-compression method based on a file's data type——Matsubara teaches the ability to determine a file's data type by analyzing its byte patterns.

Pet. 37 (citing Ex. 1010, 3:61-67; Ex. 1013 ¶ 127).

Indeed, we instituted this proceeding based in part on Petitioner's proposed incorporation of Matsubara's teaching of determining the data type as the method for Wang to automatically determine the data type in step 108, not to decompose the file in step 107, as Patent Owner argues here. *See* Dec. to Inst. 28. In light of the above, and based on the full record, Patent Owner's argument with respect to Wang's decomposition step 107 is not persuasive.

b. Wang's File Type Recognition Step 106

Patent Owner argues that there is no evidence as to how a POSITA could or would implement the file type recognition step 106 of Wang. PO Resp. 21–28. Patent Owner argues that because a POSITA would need to implement step 106 of Wang, Petitioner must put forth evidence as to how a POSITA would or could implement this aspect of Petitioner's proposed combination. *Id.* at 21.

Patent Owner cites to *Geo. M. Martin Co. v. Alliance Machine Systems Int'l LLC,* 618 F.3d 1294 (Fed. Cir. 2010) for the proposition that the "prior art must teach a person of ordinary skill to make an apparatus that works for its intended purpose. If the [prior art] did not do so on its own, [the party challenging validity] would have needed to establish that a person of ordinary skill would have nonetheless been able to make a working apparatus." PO Resp. 21–22 (quoting *Geo. M. Martin*, 618 F.3d at 1303). The prior art being asserted in Martin, however, was three existing bundle-breaking machines, not patents, as is the case here. *See Geo. M. Martin*, 618 F.3d at 1300. Unlike an existing apparatus, a patent enjoys a presumption of enablement. *See Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 314 F. 3d 1313, 1355 (Fed. Cir. 2003) (holding that a presumption arises that both the claimed and unclaimed disclosures in a prior art patent are enabled).

Here, Patent Owner argues that Dr. Creusere acknowledged in his deposition that Wang did not contain any teaching as to how a POSITA could implement the file type recognition step 106, i.e. whether a file is simple (a single data type) or compound (multiple data types). PO Resp. 22–23 (citing Ex. 2010, 21:25–22:14). Patent owner also argues that Dr. Creusere admitted that his declaration contains no opinion as to what

approach a POSITA could or would take to implement Wang's file type recognition step 106. PO Resp. 24–25 (citing Ex. 2010, 22:24–23:4, 25:14–24).

Petitioner, however, argues that Wang describes a method for automatically compressing computer files containing different information types—such as text, image, and sound—using suitable lossy or lossless compression techniques. Pet. 18. Wang provides an explanation of the operation of step 106. For example, Wang explains that if the file contains a single data type, such as a text file, a Bitmap file or a Wave file, then it is a simple file with a recognizable data type that will be compressed with a suitable code, such as a lossless code, like LZW, to compress character information. *Id.* (citing Ex. 1009, 4). Wang goes on to explain that if the file contains more than one data type, then it is a compound file, which the system will automatically decompose into a plurality of units each containing only a single data information type. *Id.* (citing Ex. 1009, 5).

Wang, being a prior art patent, is presumed to be enabled. *See Amgen*, 314 F. 3d at 1355. To the extent Patent Owner is asserting that Wang is not enabled, Patent Owner must rebut the presumption of enablement. *Id.* Patent Owner concedes, though, that it is not arguing that the entirety of the prior art, such as Wang, must be enabled. PO Resp. 27. Rather, Patent Owner explains that

> our argument is that when a Petitioner identifies *specific aspects* of the prior art that it claims the POSA would be motivated to implement in combination, with an expectation of success, in support of its obviousness theory, the Petitioner must also have evidence—from either the prior art or its expert— demonstrating that the POSA *would know how to* implement *those specific aspects* of the prior art.

Id.

Petitioner, however, is not combining Wang with Matsubara or Franaszek for purposes of modifying or implementing Wang's file type recognition step 106. Rather, Petitioner is relying solely on Wang's file type recognition step 106 as it is taught by Wang. Pet. 31–32. Petitioner is using Matsubara and Franaszek in combination with Wang for purposes of modifying and implementing Wang's data type recognition step 108, not Wang's file type recognition step 106. *Id.* at 32–34. Patent Owner's application of an expectation of success analysis for Wang's file type recognition step 106, where there is no combination of prior art being made by Petitioner, is misplaced. Accordingly, we do not find Patent Owner's argument with respect to Wang's file type recognition step 106 persuasive.

c. Wang's Data Type Recognition Step 108

Petitioner argues that there is sufficient evidence of record for the proposed combination of Wang and Franaszek to support applying content independent compression if a data type is not recognized in Wang's step 108. Pet. 24–26. Petitioner argues that Wang teaches that if a file format is not identified or recognized, then the file is compressed with a default lossless compression algorithm. *Id.* at 19 (citing Ex. 1009, 4). Petitioner further argues that Dr. Zeger, Patent Owner's Declarant, agreed that a file format potentially could refer to a data type. Pet. Reply 13 (citing Ex. 1014, 87–88). Moreover, Petitioner argues, Franaszek teaches the use of a default compression algorithm if a data type is not recognized. Pet. 22 (citing Ex. 1011, 5:49–54). Dr. Creusere, Petitioner's Declarant, also stated in his Declaration that

> [b]ased on the teaching of Wang to use a default lossless compression algorithm, such as LZW, when the file format is not identified or recognized and the teaching of Franaszek to use a default compression method when the data type is not recognized, a person of ordinary skill in the art would have been motivated to implement a default lossless compression algorithm, such as LZW, when the type of data contained in the file is not identified or recognized (e.g., if and when implementing Matsubara's technique for identifying the type of data in a file does not identify the data type). In this regard, a person of ordinary skill in the art would have been particularly motivated to use a lossless default compression method when the data type is not identified to avoid the loss of any data because, as Franaszek describes, "the loss of even a single bit can be catastrophic" for some files. RIV-1010, 1:22-31.

Ex. 1013 ¶ 86.

Patent Owner argues that there is no evidence that a POSITA would have been motivated to incorporate Franaszek into Wang's data type recognition step 108, so that a default lossless compression algorithm would be used if the date type is not identified or recognized. PO Resp. 28–33. Patent Owner argues that Dr. Creusere admitted in his deposition that neither Wang's teachings nor Dr. Creusere's Declaration provides motivation for such a combination. *Id.* at 29. The proposed combination, Patent Owner argues, rests on the premise that Wang may fail to recognize certain data types at step 108. *Id.* (citing Ex. 1013 ¶ 115; Ex. 2010, 94:4–18). According to Patent Owner, however, Dr. Creusere admitted repeatedly that Wang never fails to recognize any data types and does not even suggest the possibility. *Id.* Patent Owner further argues that Dr. Creusere admitted that his declaration contains no discussion or reasoning as to why a POSITA would come to the conclusion that the method of Wang may in fact fail to recognize some data types. *Id.* at 30–31 (citing Ex. 2010, 75:2–12). Patent

Owner thus contends that Petitioner has failed to make a threshold showing that a POSITA would have been motivated to combine Wang and Franaszek. PO Resp. 33.

We are not persuaded by Patent Owner's arguments. The test for obviousness is what the combined teachings of the references would have suggested to those of ordinary skill in the art. *In re Keller*, 642 F.2d 413, 425 (CCPA 1981). "Under the correct [obviousness] analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 420 (2007). "[A]n analysis of obviousness . . . may include recourse to logic, judgment, and common sense available to the person of ordinary skill that do not necessarily require explication in any reference or expert opinion." *Perfect Web Technologies, Inc. v. InfoUSA, Inc.*, 587 F.3d 1324, 1329 (Fed. Cir. 2009).

Here, Wang teaches that if a file format is not identified or recognized, then the file is compressed with a default lossless compression algorithm. Pet. 19 (citing Ex. 1009, 4). Dr. Zeger, Patent Owner's Declarant, agreed that a file format potentially could refer to a data type. Pet. Reply 13 (citing Ex. 1014, 87–88). With respect to Patent Owner's argument that Wang never fails to recognize any data types, Franaszek recognizes the issue and teaches the use of a default compression algorithm if a data type is not recognized. Pet. 22 (citing Ex. 1011, 5:49–54). This is consistent with the holding in *KSR*, that any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed by

Petitioner. *KSR*, 550 U.S. at 420. Furthermore, Dr. Zeger acknowledged that the number of data types was increasing at the relevant time period, so that, as Petitioner argues, a POSITA would have been well aware of this issue at the time. Pet. Reply 13–14; Ex. 1014, 88. Dr. Creusere also explained that

> [b]ased on the teaching of Wang to use a default lossless compression algorithm, such as LZW, when the file format is not identified or recognized and the teaching of Franaszek to use a default compression method when the data type is not recognized, a person of ordinary skill in the art would have been motivated to implement a default lossless compression algorithm, such as LZW, when the type of data contained in the file is not identified or recognized (*e.g.*, if and when implementing Matsubara's technique for identifying the type of data in a file does not identify the data type).

Ex. 1013 ¶ 86.

Accordingly, there is sufficient evidence in the record that a person of ordinary skill in the art would have been motivated to incorporate Franaszek's default lossless compression algorithm into Wang's data type recognition step 108 if the data type is not identified or recognized as proposed by Petitioner.

d. Rationale to Combine Matsubara and Franaszek

Petitioner argues that its proposed combination of Wang, Matsubara, and Franaszek incorporates the teachings of Matsubara and Franaszek into Wang's method for different purposes. Petitioner argues the proposed combination implements (1) Matsubara's technique for automatically identifying the type of data in a file; (2) Franaszek's technique of applying a default compression algorithm if the type of data contained in a file is not recognized; and (3) Franaszek's technique of appending a recognizable data

token indicative of a content dependent data compression algorithm applied to the data. Pet. 22–30.

Petitioner also explains how the teachings of Matsubara and Franaszek would be combined in this context. For example, in describing the reasons for applying a default compression algorithm if the type of data contained in a file is not recognized—as taught by Franaszek—in Wang's method for automatically compressing computer files, Petitioner explains that Wang uses a default lossless compression algorithm when the file format is not identified or recognized and Franaszek uses a default compression method when the data type is not recognized. Pet. 24–26. Therefore, Petitioner argues, a person of ordinary skill in the art would have been motivated to implement a default lossless compression algorithm, such as LZW, when the type of data contained in the file is not identified or recognized (e.g., if and when Matsubara's technique for identifying the type of data in a file does not identify the data type). *Id.* at 25–26.

Patent Owner argues that it is not sufficient for Petitioner to combine separately Matsubara with Wang for data analysis and Franaszek with Wang for content independent compression. PO Resp. 33–40. Patent Owner argues Petitioner must establish the obviousness of the combination of Matsubara with Franaszek to show that a POSITA would have been motivated to use Matsubara's data analysis technique with Franaszek's content independent compression algorithm in the base method of Wang. *Id.* at 34. Patent Owner argues that Dr. Creusere admitted that Petitioner simply does not address why a POSITA would have been motivated to use a data analysis technique from Matsubara when Franaszek already teaches its own way of analyzing data. *Id.* at 34–35 (citing Ex. 2010, 54:11–24, 58:14–19).

We do not agree with Patent Owner's arguments. The test for obviousness is what the *combined* teachings of the references would have suggested to those of ordinary skill in the art. *In re Keller*, 642 F.2d at 425. When analyzing a claim for obviousness, we look to see whether "a *skilled artisan* would have been motivated to combine the teachings of the prior art references to achieve the claimed invention." *Pfizer, Inc. v. Apotex, Inc.*, 480 F.3d 1348, 1361 (Fed. Cir. 2007) (emphasis added). "[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill." *KSR*, 550 U.S. at 417. Moreover, "Under the correct [obviousness] analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." *Id.* at 420.

Wang's method is a multi-step process for identifying and compressing the type of data in a file. Ex 1009. Wang's process includes a "recognize information type" (data recognition step 108) as one step in the process. *Id.* at Abstract; Pet. 17–19; PO Resp. 2–3. Petitioner's rationale for combining the teaching of Matsubara and Wang is premised on incorporating Matsubara's teaching the construction of histograms of files based on a file's byte pattern, and then analyzing the pattern to determine the data type as the method for Wang to "automatically" determine the data type of a file at the data recognition step 108. *See* Pet. 32–33.

Dr. Creusere explains that Wang discloses that the type of data contained in a file is recognized automatically, but does not describe explicitly *how* the type of data contained in the file is recognized automatically. Ex. 1013 ¶ 70. Dr.

Creusere states that ways of recognizing automatically the type of data contained in a file were well known to persons of ordinary skill in the art at the time. *Id.* For instance, Matsubara teaches a technique for recognizing automatically the type of data contained in a file. *Id.*; Ex. 1010, Abstract, 1:9–14, 1:45–2:36, 3:46–4:21. In particular, Dr. Creusere explains, Matsubara teaches evaluating byte patterns of a file to determine the type of data in the file in order to determine which compression algorithm to apply to the data. Ex. 1013 ¶ 70; Ex. 1010, 1:9–11. Based on the teaching of Wang to recognize automatically the data type of a file, but not explicitly how to do so, Dr. Creusere states that a person of ordinary skill in the art would have been motivated to implement Matsubara's known technique of evaluating byte patterns of a file to determine the type of data in the file to recognizing automatically the type of data contained in a file as taught by Wang. Ex. 1013 ¶¶ 72–73; *see also id.* ¶¶ 74, 76, 78–81.

Petitioner combines the teachings of Franaszek and Wang for a different and distinct purpose. Petitioner relies on Franaszek's techniques for using a default compression algorithm to compress data types that may not be recognized or identified, such as by the data recognition step 108 of Wang. Pet 24–26. Petitioner explains that Wang does not address specifically *what* to do if the type of data contained in the file is not recognized at the data recognition step 108. Pet. 24. Dr. Creusere states, however, that it was well known to a person of ordinary skill in the art at the time to use a default encoder to compress data when the data type is not recognized. Ex. 1013 ¶ 82. For example, Franaszek teaches using a default compression algorithm to compress data types that are not recognized or identified. Ex. 1011, 5:49–54; Ex. 1013 ¶ 82. Dr. Creusere states that a person of ordinary skill in the art would have been motivated to implement the default lossless compression algorithm taught

by Franaszek when the type of data contained in a file is not identified or recognized, for example, when Matsubara's technique for identifying the type of data in a file does not identify the data type during the data recognition step 108 of Wang. Pet. 25–26; Ex. 1013 ¶¶ 82–87.

Patent Owner, nonetheless, argues that Petitioner must establish the obviousness of the combination of Matsubara and Franaszek. PO Resp. 34. Patent Owner argues that Petitioner must provide a rationale for why Petitioner *did not* use Franaszek's data analysis technique, but instead chose to use Matsubara's technique. *Id.* at 37. Patent Owner argues that the Federal Circuit recently made clear in *In re Schweickert*, 676 F. App'x 988 (Fed. Cir. January 26, 2017), that a POSITA would not create a combination that fails to make any improvement over what is already taught by the base reference, asserting that Petitioner must articulate a need or motivation for a POSITA to disregard Franaszek's method and use Matsubara's technique instead. PO Resp. 36–37.

We think Patent Owner's argument and its reliance on *In re Schweickert* is misplaced here. First, as discussed *supra,* Petitioner combines Matsubara with Wang to address an automatic recognition issue and combines Franaszek with Wang to address a known issue when there is a lack of recognition. These are distinct issues with different reasons for their combination. In particular, Petitioner's rationale for combining Matsubara and Wang is based on incorporating Matsubara's construction of histograms using a file's byte pattern, and then analyzing the pattern to determine the data type as the method for Wang to "automatically" determine the data type of a file. Pet. 22–24. Petitioner relies on Franaszek's techniques for using a default compression algorithm to

compress data types that may not be recognized or identified by Wang. *Id.* at 24–26.

Second, in *In re Schweickert*, the Board affirmed the Examiner's conclusion of obviousness, relying on a combination of two prior art references, with the bare assertion that "modifying [the references] would have been a predictable use of prior art elements according to their established functions—an obvious improvement." *In re Schweickert at 993.* The Court found that there was no sufficient justification in the opinion by the Board why the combination would provide the asserted "obvious improvement." *Id.* at 994. Moreover, the Court noted that it was apparent that substitution would "defeat[] the purpose" of the prior art the Board contended would be obvious to modify. *Id.* The Court found that even if the technology of the second prior art reference were "readily applicable" to the first prior art reference, there still needed to be an explanation as to "why a skilled artisan would still have a reason to combine [the references] to achieve the claimed invention," which the Board did not do. *Id.* at 995.

Here, unlike in *Schweickert*, Petitioner provided evidentiary support for modifying Wang's method for automatically compressing files using an identification technique (Matsubara) since Wang teaches automatically recognizing the data type in the file, (Ex. 1013 ¶ 77) and using Franaszek's default lossless compression algorithm when a file's data type is not recognized because Wang teaches to use a default lossless compression algorithm when a file format is not identified or recognized (*id.* ¶ 86). Thus, Petitioner has articulated sufficient reasoning why a POSITA would have combined the teachings of Wang and Matsubara, as well as reasons why a POSITA would have also combined the teachings of Wang and Franaszek

addressing a distinct issue, and how those combinations achieve the claimed invention.

Accordingly, we are persuaded by Petitioner's evidence and arguments that a person of ordinary skill in the art would have had reason to combine (1) Wang's teaching to use a default lossless compression algorithm, such as LZW, when the file format is not recognized with Franaszek's teaching of using a default compression method when the data type is not recognized; and (2) Wang's method for automatically compressing computer files with Franaszek's techniques for using a default compression algorithm to compress data types that are not recognized or identified. *See* Pet. 24–26, 30–42. Petitioner's rationale for combining Wang and Matsubara is based on using Matsubara's data analysis technique in Wang's step of automatic data recognition, whereas Petitioner's rationale for combining Wang and Franaszek is directed to both references suggesting default compression methods for unrecognized data. *See* Pet. 22–24, 30–42. Thus, each of the aspects that would be used from Matsubara and Franaszek with Wang are different. Therefore, we are persuaded by Petitioner's evidence and arguments that one of ordinary skill in the art would have been led to combine the teachings of Wang, Matsubara, and Franaszek in the manner articulated by Petitioner.

e. Teaching of the Claimed Analysis Steps

Patent Owner argues that Wang does not teach the claimed analysis steps because Wang's file extensions and control information are "descriptors" as claimed. PO Resp. 41–44. Patent Owner argues that file extensions, like those in Wang, are descriptors. *Id.* at 42. The '513 patent explains that "[F]ile type descriptors are typically appended to file names to

describe the application programs that normally act upon the data contained within the file." Ex. 1001, 2:66–3:2. Dr. Creusere stated that "[f]or purposes of Wang, an extension name means something like a .jpg or a .bmp or .doc or .pdf." Ex. 2010, 33:9–12. Thus, Patent Owner argues, Wang's file extension is a descriptor, and analysis of the extension cannot satisfy the claim limitations. PO Resp. 42.

Patent Owner also argues that Wang's control information is no different. *Id.* At deposition, Patent Owner argues that Dr. Creusere characterized control information as a header or as "a footer appended to the end of the file, depending on the file format type." Ex. 2010, 34:17–20. Dr. Zeger explained that Wang's control information is information about the file. Ex. 2006 ¶¶ 67–77. Patent Owner argues that given Wang's control information is a descriptor, even Dr. Creusere agrees that Wang alone does not teach the recited analysis steps. PO Resp. 44 (citing Ex. 2010, 9:9–20).

Petitioner, however, argues that it is the *combination* of Wang, Matsubara, and Franaszek that teaches the recited analysis steps. Pet 40–42. According to Petitioner, Matsubara's technique for identifying the type of data in the file, which includes constructing a histogram based on the byte patterns occurring in a file and analyzing the histogram to determine the type of data in the file, excludes analyzing the file based only on a descriptor indicative of any characteristic, attribute, or parameter. *Id.* at 41–42 (citing Ex. 1010, 1:55–2:36; Ex. 1013 ¶¶ 135, 141). Petitioner, therefore, concludes that the combination of Wang, Matsubara, and Franaszek teaches the recited analysis steps. *Id.*

We agree with Patent Owner's position that the file extension names and control information in Wang appear to be "descriptors" of a data block.

Nevertheless, we are persuaded by Petitioner that the *combination* of Wang, Matsubara, and Franaszek teaches the recited analysis steps.

Specifically, we are persuaded that Wang recognizes the format of a file by the extension name of the file and determines whether the file is a simple file or a compound file, *then* teaches automatically recognizing the type of data contained in the file and automatically compressing the data using a compression algorithm suitable for the type of data identified. Pet. 32 (citing Ex. 1009, 4; Ex. 1013 ¶ 115). In addition, we are persuaded Matsubara teaches determining a file's data type based on an analysis of its byte patterns (i.e., something other than a descriptor) (Ex. 1011, 3:61–67), while Franaszek teaches analysis of a sample taken from uncompressed data appended to a data block and compressing a data block with a default compression algorithm when the data type is not identified (Ex. 1011, 4:30–35, 5:18–21, 5:53–54, Fig. 2). Furthermore, based on the testimony of Dr. Creusere (Ex. 1013 ¶ 116), histograms of byte patterns of a file in Matsubara function as an analysis of a data block and not merely as a descriptor of the data block. Accordingly, we find the combination of Wang, Matsubara, and Franaszek teaches the recited analysis steps as limited by the "wherein" clauses of independent claims 1 and 15.

2. Separate Patentability of Dependent Claims 3, 4, 10, 11, 18 and 19

Patent Owner contends that Petitioner has failed to establish the unpatentability of dependent claims 3, 4, 10, 11, 18 and 19. PO Resp. 44–51. Petitioner disagrees. Pet. Reply 14–23.

a. Dependent Claims 11 and 19

Claim 11 of the '513 Patent depends from claim 1 and recites "the analyzing the plurality of data blocks includes analyzing data structures or

file substructures associated with the plurality of data blocks." Claim 19 recites similar features. Patent Owner argues that Matsubara operates by constructing a histogram based on the file's byte values and analyzing that histogram to determine the file's data type, none of which involves analyzing how data elements of a file are arranged or organized. PO Resp. 47.

Petitioner argues that Matsubara's technique of determining a file's data type includes constructing a histogram based on an analysis of the file's byte patterns and that by analyzing the file's byte patterns, Matsubara is analyzing a data structure or file substructure. Pet. Reply 14–15 (citing Ex. 1010, 1:55–2:36). Petitioner argues that Dr. Zeger agrees that a file is an organization of bytes. *Id.* at 15 (citing Ex. 1014, 54–55). Therefore, Petitioner argues, when Matsubara analyzes a file's bytes to create a histogram and determine the file's data type, Matsubara analyzes data structures or file substructures. *Id.* at 15–16. Petitioner argues, contrary to Patent Owner's argument, a bit pattern *is* the organization or arrangement of the bits in a byte, even though a bit pattern also allows for the determination of a byte's value. Pet. Reply 16. Thus, Petitioner argues, for Matsubara to determine the value of each byte, Matsubara necessarily analyzes the organization/arrangement of the bits in each byte. *Id.*

We agree with Petitioner. The recited limitation is "analyzing data structures or file substructures associated with the plurality of data blocks." Patent Owner notes that both Dr. Zeger and Dr. Creusere agree that the data structure of a file refers to how that data is organized within a file. PO Resp. 45. Even given Patent Owner's argument that "Matsubara's 'byte pattern' is synonymous for the value of a byte," to determine the value of a byte, one

must necessarily examine the pattern or organization of the individual bits in a byte to determine the value of a byte. As Matsubara illustrates, "the bit pattern 01000000 . . . is the binary representation of 128." Ex. 1010, 3:30–32. In order to make this determination, one must know the position of each bit in the byte and the value of each bit in that position in order to determine the value of the byte. As Petitioner notes, this is what Matsubara does when Matsubara constructs a histogram based on an analysis of the file's byte patterns. Pet. Reply 16. In doing so, Matsubara is analyzing a data structure or file substructure under Patent Owner's own proposed definitions.

Accordingly, we find the combination of Wang, Matsubara, and Franaszek teaches the recited limitations of dependent claims 11 and 19.

b. Dependent Claims 3 and 4

Claim 3 depends from claim 1 and recites "wherein the analyzing the plurality of data blocks and the applying the content independent data compression algorithm occurs before the analyzing the data block and the applying the content dependent data compression algorithm." Claim 4 recites the reverse: wherein analyzing the data block and applying content dependent analysis and compression occurs before analyzing the plurality of data blocks and the applying the content independent data compression algorithm.

Patent Owner argues that Wang conducts all of its analysis before all of its compression. PO Resp. 48 (Ex. 2006 ¶¶ 130–135.) Because Wang conducts all of its analysis before all of its compression, Patent Owner argues that Wang doesn't disclose or suggest that content independent analysis and compression occurs either before or after the content dependent analysis and compression. *Id.*

Petitioner argues that the combination of Wang, Matsubara, and Franaszek results in a method that operates in the same manner as the ’513 patent in that the order the method analyzes and applies the content independent data compression and content dependent data compression is determined based on the data to be compressed. Pet. Reply 17 (citing Ex. 1013 ¶ 148). Petitioner argues that claims 3 and 4 simply recite the different orders in which the analyses and compression can occur based on the received data. *Id.* at 19. In particular, Petitioner argues, claim 3 requires at least one of the content independent analysis and compression to occur before at least one of the content dependent analysis and compression, while claim 4 requires the opposite. *Id.* Petitioner argues that this was confirmed by Dr. Zeger when he explained that the order is based on whether the data is recognized or not at Block 1300 of the ’513 Patent. *Id.* at 18 (citing Ex. 1014, 53). Petitioner argues, therefore, that the combination of Wang, Matsubara, and Franaszek operates in the same manner as the ’513 Patent. *Id.* at 18.

Petitioner points out that the method resulting from the combination of Wang, Matsubara, and Franaszek can be performed any number of times and can receive any number of simple files and/or compound files of various types such that each of the claimed orderings will occur. *Id.* at 20. Petitioner asserts that Dr. Zeger conceded this point. *Id.* (citing Ex. 1014, 54–55).

We agree with Petitioner. There is nothing recited in claims 3 or 4, or their incorporation of all the limitations recited in independent claim 1, or anything disclosed in the ’513 Patent, that would preclude performing the claimed method any number of times on any number of simple files and/or

compound files of various data types resulting in the order of analysis and compression recited in claims 3 or 4. When the method is performed a first time with a first file (e.g., a content dependent file), then subsequently performed a second time with a second file (e.g., a content independent file), then both the analysis and compression of the first file (i.e., content dependent) occurs before both the analysis and compression of the second file (i.e., content independent). This holds true regardless of whether a content independent file is processed before a content dependent file, or vice versa.

Accordingly, we find that Petitioners' combination of Wang, Matsubara, and Franaszek teaches the recited limitations of claims 3 and 4.

c. Dependent Claims 10 and 18

Claim 10 depends from claim 1 and recites "wherein the content independent and content dependent algorithms are applied serially." Claim 18 depends from claim 15 and recites similar subject matter.

Patent Owner argues that Wang is silent on whether its compression algorithms are applied to its information units serially or in parallel. PO Resp. 49. Patent Owner argues that Wang simply says that "[i]f the file is a compound file, . . . the system will automatically decompose the file into a plurality of units each containing only a single data information type, and then compressing each unit." *Id.* (citing Ex. 1009, 5.). Patent Owner argues that because Wang doesn't disclose how it applies its compression algorithms to its information units, Wang could very well compress in parallel, and not in serial as claimed. *Id.* at 50.

Petitioner argues that because there is no disclosure or suggestion in the '513 Patent of applying both content independent data compression and

content dependent data compression to a given data block, the "serially" limitation of claims 10 and 18 is best understood to require applying either the content independent compression algorithm or content dependent compression algorithm before applying the other. Pet. Resp. 19 (citing Ex. 1013 ¶ 162). Petitioner argues that the data itself dictates the order in which the analysis and application of the content dependent data compression and content independent data compression occurs in the context of both the '513 patent and the combination of Wang, Matsubara, and Franaszek. *Id.* at 19–20. Dr. Zeger agreed that any combination of simple and compound files could be processed by reapplying the method of Wang to each file. *Id.* at 21. Therefore, both orderings are possible (i.e., content dependent before content independent, and vice versa), Petitioner argues, and both orderings will occur during operation. *Id.* at 20.

We agree with Petitioner. There is nothing recited in claims 10 or 18, or their incorporation of all the limitations recited in independent claim 1, that would preclude performing the claimed method any number of times on any number of simple files and/or compound files of various data types resulting in the serial application of the algorithms recited in claims 10 and 18. When the method is performed a first time with a first file (e.g., a content independent file), then subsequently performed a second time with a second file (e.g., a content dependent file), then the application of the algorithms occurs in the recited serial fashion.

Accordingly, we find that Petitioners' combination of Wang, Matsubara, and Franaszek teaches the recited limitations of claims 10 and 18.

E. Objections to Demonstratives

Each of the parties filed objections to demonstratives. *See* Papers 62, 63. A hearing was held on July 25, 2017, where each party presented its arguments and used its demonstratives. The parties each had the opportunity to address any objections they may have had to each other's demonstratives.

Demonstratives are not evidence. As such, demonstratives cannot add new evidence to the record of the proceeding. Demonstratives are not an opportunity for additional briefing. Arguments that have not been made previously cannot be made at the hearing, and thus, cannot be included demonstratives. Nevertheless, demonstrative may be helpful, in that they are intended to be visual aids to assist a party in making its oral presentation to the Board. However, mischaracterizations of the record, inclusion of new arguments, or citations to the record that do not support the content of a demonstrative, are not.

In this Final Written Decision, we rely only on the arguments presented properly in the parties' briefs and the evidence of record. Any new arguments or new evidence presented in demonstratives are not properly in the record and are not considered for purposes of this Final Written Decision. Accordingly, the parties' objections to demonstratives are moot.

F. Objections to Certain Arguments in Petitioner's Reply

Pursuant to the Board's prior authorization, Patent Owner filed a list (Paper 51) of the locations and descriptions of portions of Petitioner's Reply (Paper 45) that Patent Owner claims exceed the proper scope of reply to Patent Owner's Response (Paper 34). Petitioner filed a response (Paper 54) listing the basis for each allegedly improper statement identified by Patent

Owner, and for each such statement identifying (1) the argument from the Patent Owner's Response that the statement is responding to; and (2) exemplary portions of the evidentiary record supporting the statement by Petitioner. An oral hearing was held on July 25, 2017, where each party presented its arguments for trial and each party had the opportunity to address Patent Owner's objections to the alleged improper arguments in Petitioner's Reply.

Pursuant to 37 C.F.R. § 42.23, a reply may only respond to arguments raised in the corresponding opposition, patent owner preliminary response, or patent owner response. Arguments in Petitioner's Reply that exceed this scope are improper and will not be considered. This includes arguments that have not been made previously by Petitioner.

In this Final Written Decision, we rely only on the arguments presented properly in the parties' briefs and the evidence of record. Any new arguments presented in Petitioner's Reply or arguments that exceed proper scope under 37 C.F.R. § 42.23, are not properly in the record and are not considered for purposes of this Final Written Decision. Accordingly, Patent Owner's objections to certain arguments in Petitioner's Reply are moot.

G. Motion to Exclude

On February 8, 2017, Patent Owner filed and served its Patent Owner's Response (Paper 34), along with the Declaration of Dr. Kenneth Zeger (Exhibit 2006) and a document purported to be a paper by Jonathan Sachs entitled "Using Curves and Histograms" (Ex. 2009). In accordance with 37 C.F.R. § 42.64(b)(1), Petitioner timely filed and served Patent Owner with objections to the admissibility of the Exhibits 2006 and 2009.

See Paper 37. Patent Owner did not to respond to Petitioner's objections by filing or serving any supplemental evidence as allowed under the rules. Petitioner moves to exclude Exhibit 2009 and any argument or testimony found within Exhibit 2006 that relies Exhibit 2009. Paper 48, 2 ("Mot. to Excl."). Petitioner argues that the document purported to be a paper by Jonathan Sachs submitted as Exhibit 2009 (the "Sachs Document") should be excluded under F.R.E. 901 as unauthenticated and under F.R.E. 402 as irrelevant. *Id.* at 3.

Petitioner argues that Patent Owner has produced no evidence to support a finding that Exhibit 2009 is in fact what Patent Owner's expert claims it is—the "paper 'Using Curves and Histograms' [by] Jonathan Sachs." *Id.* (citing Ex. 2006 ¶ 98). Petitioner asserts that Patent Owner's Response makes no mention of the Sachs Document, and Patent Owner's expert, Dr. Zeger, merely cites to it in his declaration without explaining where he found it, when and where it was published , or if the copy of the document filed as Exhibit 2009 is an unaltered, true, and correct copy. *Id.*

Petitioner also argues that there is no evidence to support a finding that Exhibit 2009 is relevant to the state of the art as of the '513 Patent's effective filing date of October 29, 2001. *Id.* at 5. Petitioner argues that neither Patent Owner nor its expert, Dr. Zeger, provide any evidence or argument to show that Exhibit 2009 would have been available to a person of ordinary skill in the art at the time of the '513 Patent. *Id.* Petitioner also argues that because Exhibit 2009 has not been authenticated and is irrelevant to this proceeding, paragraphs 98–100 of Dr. Zeger's Declaration, which cite to and rely on the Sachs Document, should be excluded. *Id.* at 7–8.

Patent Owner does not dispute Petitioner's assertion that Petitioner timely filed and served Patent Owner with objections to the admissibility of Exhibits 2006 and 2009. *See* Paper 53, 1–9 ("PO Resp. Mot. to Excl."). Patent Owner does not dispute that it did not to respond to Petitioner's objections by filing or serving any supplemental evidence as allowed under the rules. *Id.* Patent Owner argues, however, that far from relying on Exhibit 2009, Dr. Zeger's Declaration states that Exhibit 2009 is merely an "example" illustrating his opinion. *Id.* at 3. Accordingly, Patent Owner requests that even if the Board excludes the Sachs Document from which Dr. Zeger drew his illustrative example, the Board should not exclude those portions of Dr. Zeger's opinion that do not rely on it expressly. *Id.*

We agree with Petitioner that Exhibit 2009 should be excluded from Evidence under F.R.E. 901 as an unauthenticated document. The burden is on Patent Owner to produce evidence sufficient to support a finding that Exhibit 2009 is what the Patent Owner claims it is. Patent Owner has provided no evidence to that effect. Accordingly, Exhibit 2009 shall be excluded from Evidence pursuant to F.R.E. 901, as well as those portions of paragraphs 98–100 in Dr. Zeger's Declaration (Ex. 2006) that rely expressly on Exhibit 2009.

III. CONCLUSION

Based on all the evidence of record, we determine that Petitioner has established by a preponderance of the evidence that claims 1–4, 6, 10–16, 18–20, and 22 of the '513 Patent would have been obvious over the combined teachings of Wang, Matsubara, and Franaszek under 35 U.S.C. § 103(a).

IV. ORDER

For the reasons given, it is

ORDERED that claims 1–4, 6, 10–16, 18–20, and 22 of the ’513 Patent have been shown to be unpatentable;

ORDERED that Exhibit 2009 is excluded from Evidence pursuant to F.R.E. 901, as well as those portions in paragraphs 98–100 of Dr. Zeger’s Declaration (Ex. 2006) that rely expressly on Exhibit 2009; and

FURTHER ORDERED that parties to the proceeding seeking judicial review of the Final Written Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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