

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

UNIFIED PATENTS INC.,
Petitioner,

v.

VELOS MEDIA, LLC,
Patent Owner.

IPR2019-00710
Patent 8,964,849 B2

Before DANIEL J. GALLIGAN, JASON W. MELVIN, and
AARON W. MOORE, *Administrative Patent Judges*.

MELVIN, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining No Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

Petitioner, Unified Patents, Inc.,¹ filed a Petition (Paper 3, “Pet.”) requesting *inter partes* review of claims 1, 2, 11, 12, and 22 (“the challenged claims”) of U.S. Patent No. 8,964,849 B2 (Ex. 1001, “the ’849 patent”). Patent Owner, Velos Media, LLC, timely filed a Preliminary Response. Paper 7 (“Prelim. Resp.”). We instituted review of the challenged claims. Paper 8 (“Institution Decision” or “Inst.”).

Patent Owner filed a Response. Paper 21 (“PO Resp.”). Petitioner filed a Reply. Paper 25 (“Pet. Reply”). Patent Owner filed a Sur-Reply. Paper 31 (“PO Sur-Reply”). We held a hearing on June 8, 2020, and a transcript appears in the record. Paper 41 (public version) (“Tr.”); Paper 42 (full version).

This is a final written decision as to the patentability of the challenged claims. For the reasons discussed below, we determine that Petitioner has not shown by a preponderance of the evidence that any of the challenged claims is unpatentable.

A. THE ’849 PATENT

The ’849 patent is titled “Multi-Level Significance Maps for Encoding and Decoding” and describes data-compression techniques related to encoding and decoding video data. Ex. 1001, codes (54), (57), 1:16–18. Blocks of pixel data are transformed into blocks of coefficients that represent the pixels, known as transform units. *See id.* at 1:37–42, 1:49–56. Transform units may be further represented by significance maps made from significant-coefficient flags that each indicate whether a corresponding

¹ Petitioner has now changed its name to Unified Patents, LLC. Paper 22.

coefficient in the transform unit is nonzero. *Id.* at 4:64–5:9. Encoding the information from a significance map to a bitstream involves scanning the map in a certain order and encoding the information according to a particular scheme. *Id.* at 7:39–8:4.

The Specification describes that encoding significance maps may benefit from using “multi-level significance maps for certain transform units.” *Id.* at 8:38–40. Such an approach involves grouping the significant-coefficient flags by “dividing or partitioning the transform unit structure into blocks.” *Id.* at 8:45–54. Figure 4 is reproduced below:

xC

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	1	1	0	1	1	0	0	0	1	1	1	0	0	0	0	0
1	1	0	1	1	1	0	1	1	0	1	1	0	1	0	0	0
2	0	1	0	0	1	0	1	1	0	1	1	1	0	0	0	0
3	0	0	0	1	1	1	1	1	0	0	1	0	0	0	0	0
4	1	1	0	0	1	0	1	0	0	1	0	1	0	0	0	0
5	1	1	0	1	0	0	1	0	1	0	0	1	0	0	0	0
6	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0
7	1	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0
8	0	1	1	1	0	1	0	1	1	1	1	0	0	1	0	0
9	0	0	1	0	0	1	1	1	0	0	0	1	0	0	0	0
10	1	0	0	1	0	0	0	0	1	1	0	0	1	0	0	0
11	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0
12	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
13	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

yC

102

FIG. 4

Id. at Fig. 4. Figure 4 depicts an example 16×16 significance map 102 divided into sixteen 4×4 blocks. *Id.* at 8:62–9:13. To implement the

multilevel approach to significance maps, each 4×4 block of significant-coefficient flags in Figure 4 is assigned a significant-coefficient-group flag, indicating whether the block contains a nonzero coefficient. *Id.* at 9:25–37.

Figure 5 is reproduced below:

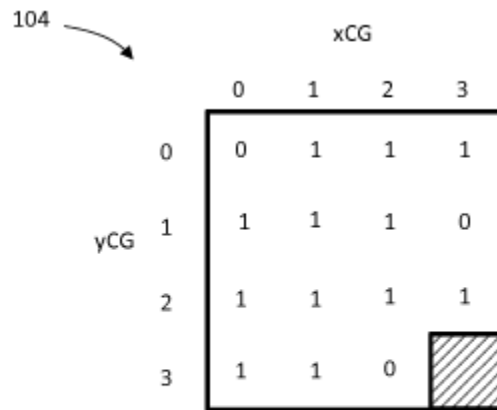


FIG. 5

Id. at Fig. 5. Figure 5 depicts a higher-level significance map 104 created from Figure 4’s significance map. *Id.* at 9:38–50. Such higher-level significance maps can benefit efficiency during coding because a significant-coefficient-group flag with a zero value indicates that there is no need to process the individual significant-coefficient flags of that group—they are all zero. *Id.* at 10:43–54. The higher-level significance maps also allow certain “special cases that are accounted for in the encoding and decoding processes to save bits.” *Id.* at 12:6–7.

One special case described in the Specification relates to the block of coefficients in the upper-left corner of a map, which includes the coefficient in the [0, 0] position—also referred to as the DC coefficient. *Id.* at 12:16–19. Because that group represents low-frequency information in the transformed

pixel data, “[t]he probability of this group containing no non-zero coefficients is extremely low.” *Id.* at 12:19–20. Therefore, the Specification describes that, “instead of transmitting a significant-coefficient-group flag for the [0, 0] group, the encoder may be configured to always encode the significant-coefficient flags of that group and the decoder may be configured to always decode the significant-coefficient flags of that group.” *Id.* at 12:20–25.

B. CHALLENGED CLAIMS

Challenged claims 1, 11, and 22 are independent. Claim 1 is illustrative and is reproduced below:

1. A method of reconstructing significant-coefficient flags for a transform unit from a bitstream of encoded data, the method comprising:

reconstructing significant-coefficient-group flags, wherein the transform unit is partitioned into non-overlapping blocks, each block containing a respective group of significant-coefficient flags, and wherein each significant-coefficient-group flag corresponds to a respective block and its respective group of significant-coefficient flags; and

reconstructing each significant-coefficient flag by

if the significant-coefficient-flag is at position (0,0) in its group, a corresponding significant-coefficient-group flag is non-zero, the group is not the DC block, and all the previous significant-coefficient flags in that group are zero, then inferring the significant-coefficient-flag at position (0,0) in that group to be 1, and

otherwise

decoding the significant-coefficient flag from the bitstream if that significant-coefficient flag is in a

group that has corresponding significant-coefficient-group flag that is non-zero, and
setting the significant-coefficient flag to zero, if that
significant-coefficient flag is in a group that has
corresponding significant-coefficient-group flag
that is zero.

Id. at 20:42–67. Claim 11 recites similar limitations, and claim 22 is directed to a method for encoding that recites encoding limitations corresponding generally to the decoding limitations of claim 1. *Id.* at 21:41–22:4, 22:52–23:9.

C. PRIOR ART AND ASSERTED GROUNDS

Petitioner asserts that the challenged claims are unpatentable on the following grounds:

Claims Challenged	35 U.S.C. § ²	Reference(s)/Basis
1, 2, 11, 12, 22	103	Chen ³
1, 2, 11, 12, 22	103	Chen, Bao ⁴

Pet. 4. Petitioner also relies on the Declaration and Reply Declaration of Dr. Alan C. Bovik (Ex. 1002; Ex. 1036). *See generally* Pet. 4–75; Pet. Reply 3–9.

² The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. § 103. Because the effective filing date of the ’849 patent is before March 16, 2013 (the effective date of the relevant amendment), the pre-AIA version of § 103 applies. *See* Ex. 1001, code (22).

³ U.S. Patent Publication No. 2010/0086030 A1 (filed Sept. 18, 2009; published Apr. 8, 2010) (Ex. 1003).

⁴ U.S. Patent Publication No. 2007/0160133 A1 (filed Aug. 18, 2006; published July 12, 2007) (Ex. 1004).

II. ANALYSIS

A. CLAIM CONSTRUCTION

For an *inter partes* review petition filed after November 13, 2018, we construe claim terms “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b).” *See* Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51340, 51358 (Oct. 11, 2018) (amending 37 C.F.R. § 42.100(b) effective November 13, 2018) (now codified at 37 C.F.R. § 42.100(b) (2019)).

Petitioner submits only that the plain and customary meaning of the claim terms should apply. Pet. 30. Patent Owner submits that “DC block” refers to “a non-overlapping block resulting from partitioning a single transform unit” and that a DC block “includes the only DC coefficient of the transform unit at (0,0).” PO Resp. 25. Patent Owner notes that Petitioner appears to agree with that interpretation, in that Petitioner refers to the DC block as the one block with the DC coefficient. *Id.* at 25 (citing Pet. 22).

In the Institution Decision, we construed “DC block” as “the transform-unit block that includes the DC coefficient (the coefficient at (0,0) in the transform unit).” Inst. 7–8. Both parties note their agreement with our construction. PO Resp. 26; Reply 2. We maintain that construction here.

Claim 1 recites “the transform unit is partitioned into non-overlapping blocks, each block containing a respective group of significant-coefficient flags.” *Id.* at 20:46–48. Thus, the claim language itself already requires that the DC block is a non-overlapping block resulting from partitioning a single transform unit.

The Specification discloses splitting a transform unit into groups (*id.* at 8:45–54) and explains that a block is a type of group: “The significance map 102, i.e. the set of significant-coefficient flags, may be grouped based upon a uniform division of the transform unit structure into contiguous blocks in one embodiment.” *Id.* at 9:6–9; *see also id.* at 9:16–24 (describing possible group shapes as including square blocks, rectangular blocks, and diagonal slices). It further discloses that certain groups may receive special treatment; significant here is “the first group,” which “contains the DC coefficient at [0, 0] in the transform unit.” Ex. 1001, 12:6–7, 12:16–19.

In light of the claim language and Specification’s disclosures, we construe “DC block” as “the transform-unit block that includes the DC coefficient (the coefficient at (0,0) in the transform unit).”

We determine that no further constructions are required at this stage. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017); *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

B. UNPATENTABILITY OVER CHEN ALONE

Petitioner maps the limitations of claim 1 to Chen’s disclosures. Pet. 31–61. Chen discloses methods of processing video data using partitioned macroblocks. Ex. 1003, code (57). Chen’s methods include using “hierarchical coded block pattern (CBP) values to efficiently identify coded macroblocks and partitions having non-zero coefficients within a large macroblock.” *Id.* ¶ 8. Such “CBP values are each one-bit syntax values that indicate whether or not there are any nonzero transform coefficient values in a given block following transform and quantization operations.” *Id.* ¶ 126.

Chen's hierarchy of CBP values allows a value at one level to represent a matrix of values at a lower level, indicating whether at least one of those values is nonzero. *Id.* ¶ 102.

In one example, when CBP64 value 262 is a bit with a value of '1,' indicating that there is at least one non-zero coefficient in the large macroblock, CBP 260 includes the four CBP32 values 264, 266, 268, 270 for four 32x32 partitions of the large 64x64 macroblock, as shown in the example of FIG. 15.

Id. ¶ 195. Chen's Figure 15 is reproduced below:

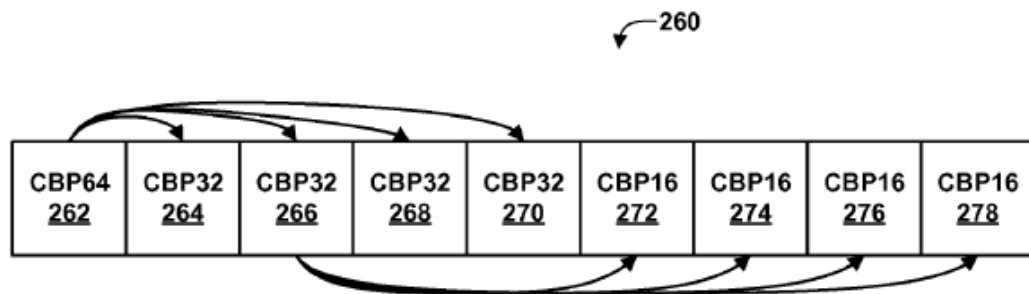


FIG. 15

Ex. 1003, Fig. 15. Figure 15 depicts an example hierarchical coded block pattern 260.

Like the '849 patent, Chen discusses techniques for improving coding efficiency by inferring the value of a coefficient based on the values of other coefficients in a block. For a block with a bit indicating the block has nonzero coefficients and four additional bits, each representing nonzero coefficients in one quarter partition of the overall block, "when the first three of the four additional bits are zero, the fourth additional bit may not be included, which the decoder may interpret as the last partition being one."

Id. ¶ 131. Chen designates further-partitioned levels of a macroblock as

higher levels and states that “[t]he highest-numbered level, in some examples, could be as fine-grain as a single pixel, i.e., a 1×1 block.” *Id.* ¶ 112.

Because Chen does not expressly state that the DC block is coded using a condition that excludes it from the inferring step, Petitioner turns to other evidence. Petitioner submits that Chen’s statement that “video decoder 30 may operate according to a video compression standard, such as the ITU-T H.264 standard,” shows a skilled artisan would understand to exclude the DC block from the inferring step. Pet. 49–50 (quoting Ex. 1003 ¶ 75). To that end, Petitioner asserts that “the H.264 standard requires that the block/group flag (‘syntax element coded_block_flag’) for a DC block be coded separately from other blocks.” *Id.* at 50. To support that the assertion, Petitioner relies on a portion of the H.264 standard that does not support such a finding without further explanation, and Petitioner directs us to no such explanation. *See* PO Resp. 65–66; Pet. 50 (citing Ex. 1018 § 9.3.3.1.1.9). Although Petitioner cites Dr. Bovik’s declaration, the statements there offer no explanation beyond the Petition’s assertion. *Compare* Pet. 50–51, *with* Ex. 1002 ¶ 87.

The H.264 standard itself appears to describe how certain variables are determined when processing according to the standard, but the standard does not plainly support Petitioner’s assertion regarding what skilled artisans would understand about the DC block. *See* Ex. 1018 § 9.3.3.1.1.9. Without such a straightforward disclosure in the reference or an adequate explanation from a declarant, Petitioner’s contentions fail to persuade us that Chen alone renders obvious the challenged claims. *See* Pet. 49. We highlighted this deficiency in the Institution Decision (Inst. 10), and Patent Owner addressed

the ground based on Chen alone in light of H.264 (PO Resp. 62–69), but Petitioner’s Reply does not offer any explanation or support beyond the Petition (*see* Pet. Reply 8 n.3).

Furthermore, even if the H.264 standard requires the group flag for the DC block to be coded separately, Petitioner has not explained how excluding the DC block from the inferring step follows from this separate coding. Indeed, if the group flag for the DC block is coded, there would be no apparent reason to deviate from Chen’s disclosure of inferring the value of the last bit in certain circumstances. *See* Ex. 1003 ¶ 131. For example, encoding the group flag with a value of one and then including a value of one for the last bit when every other bit in the group is zero runs counter to Chen’s disclosure of omitting that last bit as unnecessary. *See* Ex. 1003 ¶ 131 (“That is, the encoder may determine that the last bit has a value of one when the first three bits are zero and when the bit representative of the higher level hierarchy has a value of one.”).

We conclude that Petitioner has not shown by a preponderance of the evidence that the challenged claims would have been obvious over Chen.

C. UNPATENTABILITY OVER CHEN AND BAO

Petitioner additionally relies on Bao to assert that skilled artisans would know to exclude Chen’s DC block from the inferring step. Pet. 51–55. Like Chen, Bao relates to video coding techniques, including those that conform to and extend the H.264 standard. Ex. 1004 ¶¶ 42–43. Bao describes a mode of processing termed “Intra 16 by 16 prediction mode,” in which “the luma prediction residuals are first transformed into 16 4×4 blocks, and the DC coefficients of the 16 blocks form another 4×4 block.” *Id.* ¶ 105. Thus, a transform is performed on each of 16 separate subblocks,

producing 16 transform units, each with a DC coefficient. The DC coefficient of each transform unit is extracted and then the DC coefficients are grouped to make Bao's "DC block." *Id.* Bao's Figure 15 is reproduced below:

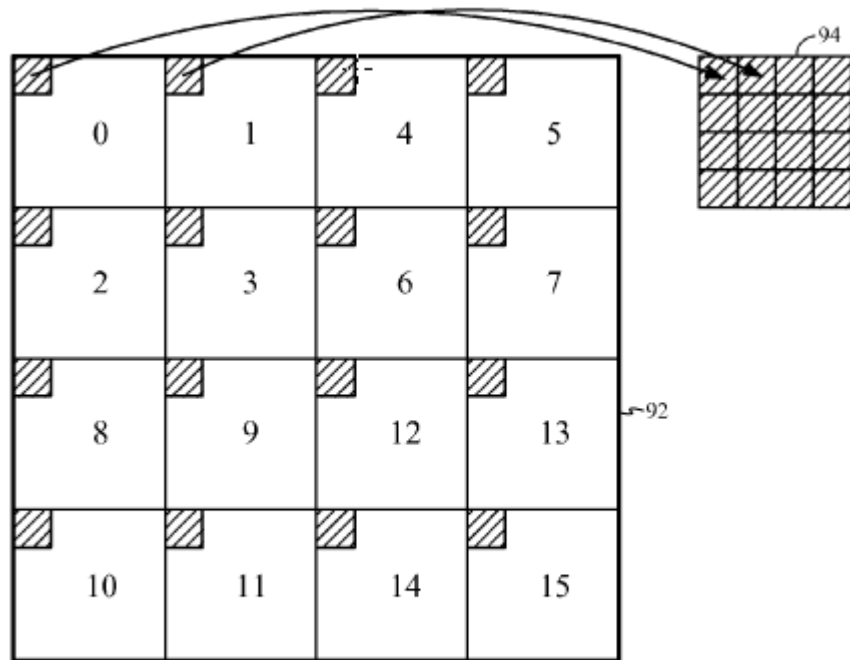


FIG. 15

Figure 15 depicts Bao's "DC block" 94, formed of the DC coefficients from each 4x4 transform unit. Ex. 1004 ¶ 105, Fig. 15. Bao discloses that, "[a]ccording to ITU-T H.264, the DC block is coded separately from the AC blocks." *Id.* ¶ 105.

Petitioner submits that a skilled artisan "would have understood that it is highly unlikely for the DC coefficient to be zero" and that, therefore, "[f]or efficiency and further reduction of the number of bits in a bitstream, it is not necessary (and often redundant) to include a flag in the bitstream to

indicate, to a decoder, whether a DC block contain at least one non-zero coefficient or not.” Pet. 53. Thus, according to Petitioner, such person “would have been motivated to modify Chen to incorporate Bao’s teachings of coding the DC block separately.” *Id.*

The problem with Petitioner’s argument is that understanding the DC block is unlikely to have a zero value does not dictate a particular approach to the coding–decoding process. A skilled artisan could configure a system to treat the DC block in a variety of ways, but Petitioner must show that it would have been obvious to arrive at the claimed approach.

In its Reply, Petitioner argues that “Bao’s teaching is based on the axiom that a DC coefficient is highly unlikely to have a value of zero; therefore, it should be processed differently.” Pet. Reply 3. Petitioner asserts that Patent Owner “has cited no other possible reason for separately processing Bao’s ‘DC block.’” Pet. Reply 3 n.1. It is not Patent Owner’s burden, however, to disprove Petitioner’s alleged motivation. Rather, Petitioner must demonstrate by a preponderance of the evidence that the claims are unpatentable. 35 U.S.C. § 316(e). This burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC. v. Nat’l Graphics, Inc.*, 800 F.3d 13.75, 1378 (Fed. Cir. 2015). Petitioner does not provide sufficient detail to explain why Bao’s teaching of coding its DC block separately would lead a skilled artisan to have excluded Chen’s DC block from the (0,0) inference. *See* PO Resp. 50. Although Petitioner asserts that Bao teaches “exclud[ing] the DC block” from the (0,0) inference (Pet. 54), we see no evidence or explanation of this in the record. Rather, as confirmed during trial, Petitioner relies on Bao to teach separate processing of a DC block (*see* Pet. Reply 1–9), which falls short of the claimed subject

matter as discussed above. Having considered the full record, we determine Petitioner has not demonstrated obviousness of claim 1 over Chen and Bao by a preponderance of the evidence.

Petitioner's contentions for claim 11, which is directed to a decoder and also recites excluding the DC block from the (0,0) inference, refer to its contentions for claim 1 and fail for the same reasons. *See* Pet. 66–67. Claim 22 is directed to a method for encoding and recites a limitation analogous to the (0,0) inference in claim 1, for which Petitioner refers to its contentions based on Chen alone and based on Chen and Bao. Pet. 75. We are unpersuaded for the reasons discussed for claim 1. Dependent claims 2 and 12 stand with their respective independent claims.

D. REAL PARTIES IN INTEREST

Patent Owner argues that we should dismiss the Petition because it does not name all real parties in interest. PO Resp. 71–76. Patent Owner identifies seven companies that have paid membership fees to Petitioner and asserts that those companies should have been named as real parties in interest. *Id.*

Petitioner challenges Patent Owner's assertions, arguing that Unified Patents Inc. is the sole real party in interest. Pet. Reply 9–18. Petitioner cites evidence that it alone controls this proceeding (Ex. 2152, 5, 10–11; Ex. 2138, 31:25–33:2; Ex. 1017, 3, 4; Ex. 2161, 93:5–17) and does not communicate with its members about potential validity challenges before filing IPRs (Ex. 2138, 222:16–223:4). Petitioner searched for and could not identify any communications with its members regarding the '849 patent or this proceeding other than public announcements. Pet. Reply 13; Ex. 2013; Ex. 2161, 68:22–69:9. Petitioner further points out that no alleged unnamed

real party in interest would be subject to a time bar under § 315(b). Pet. Reply 14.

We have considered the parties’ submissions and determine that Petitioner has adequately identified the real party in interest. Patent Owner has introduced no evidence specific to this proceeding that causes us to question Petitioner’s identification and has not identified an aspect of Petitioner’s business structure that we view as showing the alleged unnamed real parties in interest are clear beneficiaries with respect to this proceeding that have a preexisting, established relationship with Petitioner. *See Ventex Co. v. Columbia Sportswear N. Am., Inc.*, IPR2017-00651, Paper 152, 6–11 (Jan. 24, 2019) (precedential).

E. THE BOARD’S CONSTITUTIONALITY

Patent Owner asserts that the “Board lacks the authority to issue a Final Written Decision in this proceeding because the Administrative Patent Judges (‘APJs’) are principal officers of the United States that must be appointed by the President and confirmed by the Senate.” PO Resp. 69. According to Patent Owner, the Federal Circuit’s decision in *Arthrex, Inc. v. Smith & Nephew, Inc.*, 941 F.3d 1320 (Fed. Cir. 2019), “did not actually fix the problem.” PO Resp. 70.

We decline to consider Patent Owner’s constitutional challenge as the issue has been addressed by the Federal Circuit in *Arthrex*. *See Arthrex*, 941 F.3d at 1337 (“This as-applied severance . . . cures the constitutional violation . . .”).

III. CONCLUSION

For the reasons discussed above, we conclude Petitioner has not proven unpatentability of the challenged claims.

In summary:

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1, 2, 11, 12, 22	103	Chen		1, 2, 11, 12, 22
1, 2, 11, 12, 22	103	Chen, Bao		1, 2, 11, 12, 22
Overall Outcome				1, 2, 11, 12, 22

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1, 2, 11, 12, and 22 of US 8,964,849 B2 are not determined to be unpatentable; and

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

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