



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/536,218	06/28/2012	Wei-Jung Chien	1010-887US01/112751	2775
15150	7590	03/04/2019	EXAMINER	
Shumaker & Sieffert, P. A. 1625 Radio Drive, Suite 100 Woodbury, MN 55125			CHANG, DANIEL	
			ART UNIT	PAPER NUMBER
			2489	
			NOTIFICATION DATE	DELIVERY MODE
			03/04/2019	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

pairedocketing@ssiplaw.com
ocpat_uspto@qualcomm.com

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte WEI-JUNG CHIEN, PEISONG CHEN,
and MARTA KARCEWICZ

Appeal 2018-000028
Application 13/536,218
Technology Center 2400

Before JEAN R. HOMERE, ADAM J. PYONIN, and SHARON
FENICK, *Administrative Patent Judges*.

HOMERE, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from a Final Rejection of claims 1–33.¹ App. Br. 4. Claims App'x. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

¹ Appellants identify the real party in interest as Qualcomm Inc. App. Br. 2.

Introduction

According to Appellants, the claimed subject matter relates to entropy video coding for motion compensation in video coding. Spec. ¶ 2. In particular, a video coder is used to jointly code difference values for x-component information and y-component information of a motion vector into an encoded bitstream in an interleaved manner such that a first portion of the y-component is coded before a portion of the x-component, and a second portion of the x-component is coded before a portion of the y-component. *Id.* ¶¶ 5, 22.

Representative Claim

Claims 1, 9, 18, and 26 are independent. Independent claim 1 is representative, and is reproduced below with limitation at issue italicized:

1. A method of entropy coding video data, the method comprising:
when an absolute value of an x-component of a first motion vector difference value for a current block of video data is greater than zero, and when an absolute value of a y-component of the first motion vector difference value for the current block of video data is greater than zero, entropy coding, by a video coder, information representative of the first motion vector difference value, wherein entropy coding the information representative of the first motion vector difference value comprises:

coding, by the video coder, interleaved information from or into an encoded video bitstream, wherein the interleaved information includes information associated with the x-component of the first motion vector difference value and information associated with the y-component of the first motion vector difference value such that at least a first portion of the information associated with the y-component of the first motion vector difference value is coded before at least a first portion of the information associated with the x-component of the first motion vector difference value, and at least a second portion of the information associated with the x-component of

the first motion vector difference value is coded before at least a second portion of the information associated with the y-component of the first motion vector difference value,

wherein the information associated with the x-component of the first motion vector difference value includes information indicative that the absolute value of the x-component of the first motion vector difference value for the current block of video data is greater than zero, information representative of the absolute value of the x-component of the first motion vector difference value, and a sign of the x-component of the first motion vector difference value, and

wherein the information associated with the y-component of the first motion vector difference value includes information indicative that the absolute value of the y-component of the first motion vector difference value is greater than zero, information representative of the absolute value of the y-component of the first motion vector difference value, and a sign of the y-component of the first motion vector difference value.

References Relied Upon

Khmelnitsky et al.	US 5,847,776	Dec. 8, 1998
Holcomb	US 2005/0053295 A1	Mar. 10, 2005
Kikuchi et al.	US 2007/0211802 A1	Sep. 13, 2007

Marpe et al., *Context-Based Adaptive Binary Arithmetic Coding in the H.264/AVC Video Compression Standard*, IEEE Transactions on Circuits and Systems for Video Technology, Vol. 13, No. 7, 620–36 (2003).

Chien et al., *CE12: Adaptive Motion Vector Resolution from Qualcomm*, (JCT-VC) of ITU-T SG16 WP3 and ISO/IEC JTC1/SC29/WG11 No. m19173, Doc: JCTVC-D394, 1–4 (2011).

Rejections on Appeal²

² The Examiner has withdrawn the written description rejection previously entered against claims 1–33 under 35 USC 112, 1st paragraph. Advisory Act. 2.

Claims 1–33 stand rejected under 35 U.S.C. § 101 as being directed to patent-ineligible subject matter. Final Act. 12–13.

Claims 1, 9, 17, 18, and 26 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Marpe and Holcomb. Final Act. 14–21.

Claims 2, 3, 10, 11, 19, 20, 27, and 28 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Marpe, Holcomb, and Kikuchi. *Id.* at 21–25.

Claims 4–7, 12–15, 21–24, and 29–32 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Marpe, Holcomb, and Chien. *Id.* at 26–35.

Claims 8, 16, 25, and 33 stand rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Marpe, Holcomb, and Khmelnitsky. *Id.* at 36–38.

ANALYSIS³

§ 101 Rejection

An invention is patent-eligible if it claims a “new and useful process, machine, manufacture, or composition of matter.” 35 U.S.C. § 101. However, the Supreme Court has long interpreted 35 U.S.C. § 101 to include implicit exceptions: “[I]aws of nature, natural phenomena, and abstract ideas” are not patentable. *E.g., Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 216 (2014).

³ We refer to Appellants’ arguments and the Examiner’s findings and conclusions set forth in the Final Office Action (mailed August 22, 2016) (“Final Act.”), the Appeal Brief (filed, February 27, 2017) (“App. Br.”), the Answer (mailed July 28, 2017) (“Ans.”), and the Reply Brief (filed September 28, 2017) (“Reply Br.”) for the respective details.

In determining whether a claim falls within an excluded category, we are guided by the Supreme Court’s two-step framework, described in *Mayo* and *Alice*. *Id.* at 217–18 (citing *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 75–77 (2012)). In accordance with that framework, we first determine what concept the claim is “directed to.” *See id.* at 219 (“On their face, the claims before us are drawn to the concept of intermediated settlement, *i.e.*, the use of a third party to mitigate settlement risk.”); *see also Bilski v. Kappos*, 561 U.S. 593, 611 (2010) (“Claims 1 and 4 in petitioners’ application explain the basic concept of hedging, or protecting against risk.”).

Concepts determined to be abstract ideas, and thus patent ineligible, include certain methods of organizing human activity, such as fundamental economic practices (*Alice*, 573 U.S. at 219–20; *Bilski*, 561 U.S. at 611); mathematical formulas (*Parker v. Flook*, 437 U.S. 584, 594–95 (1978)); and mental processes (*Gottschalk v. Benson*, 409 U.S. 63, 69 (1972)). Concepts determined to be patent eligible include physical and chemical processes, such as “molding rubber products” (*Diamond v. Diehr*, 450 U.S. 175, 192 (1981)); “tanning, dyeing, making waterproof cloth, vulcanizing India rubber, smelting ores” (*id.* at 182 n.7 (quoting *Corning v. Burden*, 56 U.S. 252, 267–68 (1854))); and manufacturing flour (*Benson*, 409 U.S. at 69 (citing *Cochrane v. Deener*, 94 U.S. 780, 785 (1876))).

In *Diehr*, the claim at issue recited a mathematical formula, but the Supreme Court held that “[a] claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula.” *Diehr*, 450 U.S. at 187; *see also id.* at 191 (“We view respondents’ claims as nothing more than a process for molding rubber

products and not as an attempt to patent a mathematical formula.”). Having said that, the Supreme Court also indicated that a claim “seeking patent protection for that formula in the abstract . . . is not accorded the protection of our patent laws, . . . and this principle cannot be circumvented by attempting to limit the use of the formula to a particular technological environment.” *Id.* (citing *Benson* and *Flook*); *see, e.g., id.* at 187 (“It is now commonplace that an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.”).

If the claim is “directed to” an abstract idea, we turn to the second step of the *Alice* and *Mayo* framework, where “we must examine the elements of the claim to determine whether it contains an “inventive concept”” sufficient to ‘transform’ the claimed abstract idea into a patent-eligible application.” *Alice*, 573 U.S. at 221. “A claim that recites an abstract idea must include ‘additional features’ to ensure ‘that the [claim] is more than a drafting effort designed to monopolize the [abstract idea].’” *Id.* (alterations in original) (quoting *Mayo*, 566 U.S. at 77). “[M]erely requir[ing] generic computer implementation[] fail[s] to transform that abstract idea into a patent-eligible invention.” *Id.*

The PTO recently published revised guidance on the application of § 101. *2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. 50–57 (Jan. 7, 2019) (“2019 PEG”). Under the 2019 PEG, we first look to whether the claim recites:

- (1) any judicial exceptions, including certain groupings of abstract ideas (i.e., mathematical concepts, certain methods of organizing human activity such as a fundamental economic practice, or mental processes); and

(2) additional elements that integrate the judicial exception into a practical application (*see* MPEP § 2106.05(a)–(c), (e)–(h)).⁴

See 2019 PEG at 52, 55–56. Only if a claim (1) recites a judicial exception and (2) does not integrate that exception into a practical application, does the office then look to whether the claim:

(3) adds a specific limitation beyond the judicial exception that are not “well-understood, routine, conventional” in the field (*see* MPEP § 2106.05(d)); or

(4) simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception.

See 2019 PEG at 56.

Appellants argue the Examiner erred in concluding that claims 1–33 are directed to the abstract idea of “an algorithm for converting binary coded decimal to pure binary”. App. Br. 14. In particular, Appellants argue the Examiner mischaracterized the claimed invention as merely using an algorithm for encoding/decoding video data from one type of numerical representation to another, and the Examiner consequently misapplied the *Gottschalk v. Benson* precedent to arrive to the asserted conclusion. *Id.* at 15. Instead, Appellants submit that the claims are directed to encoding a bitstream by coding interleaved information including information associated with the x-component of a motion vector difference value and information associated with the y-component of the same motion vector difference value. *Id.* at 16–17. According to Appellants, the Examiner’s patent eligibility analysis fails to appreciate that the claimed coding of interleaved information provides the benefit of improving computer functionality in the technology of video coding, and thereby renders the

⁴ All references to the MPEP are to Rev. 08.2017 (Jan. 2018).

claimed subject matter patent-eligible to pursuant to the *Enfish*⁵ decision. *Id.* at 17–18, Spec. ¶¶ 22, 29, 58 (indicating that coding information in an interleaved manner improves entropy coding performance, throughput, and/or efficiency).

These arguments are persuasive. As an initial matter, we note the method of independent claim 1 recites, *inter alia*, “a method of entropy coding video data,” which is categorized as a process, one of the recognized statutory classes of inventions. As correctly noted by the Examiner, consistent with the *Benson* precedent, a video coder simply coding a video bitstream is analogous to *Benson*’s mathematical algorithm merely to convert data from one form (BCD) to another (pure Binary), and thus not directed to patent eligible subject matter. Ans. 18; *Gottschalk v. Benson*, 409 U.S. 63, 69. However, we do not agree with the Examiner that the claimed recitation of a video coder coding *interleaved information* is directed to an algorithm for merely converting data from one form to another. Ans. 18. We likewise do not agree with the Examiner that the claimed coding of *interleaved information* merely improves the algorithm as opposed to improving the functionality of the video coder itself. *Id.* at 20. Appellants’ Specification supports that the video coder coding of *interleaved information* reduces the complexity of a video coding bitstream, which may result in a lower bitrate for coded video, and may increase the entropy coding efficiency and/or throughput when using other entropy techniques, such as VLC, and CAVLC. Spec. ¶¶ 29, 58. Therefore, as persuasively argued by Appellants, the claimed recitation of the video coder coding interleaved information results in improving functionality of the video coder

⁵ *Enfish, LLC v. Microsoft Corporation*, 822 F.3d 1327 (Fed. Cir 2016).

(i.e., its entropy coding, performance, throughput and efficiency). Thus, regardless that the algorithm within claim 1 by itself may constitute patent-ineligible subject matter, taken as a whole, claim 1 integrates the algorithm into a practical application for coding a video bitstream. *Diehr*, 450 U.S. at 192–93 (explaining “when a claim containing a mathematical formula implements or applies that formula in a structure or process which, when considered as a whole, is performing a function which the patent laws were designed to protect . . . then the claim satisfies the requirements of § 101”); *see* MPEP 2106.05(a)II. We, therefore, determine claim 1 is directed to patent eligible subject matter. Accordingly, we do not address Step 2B of the Revised Guidance (approximately corresponding to step two of the *Alice/Mayo* test).

For the foregoing reasons, we do not sustain the § 101 rejection of claim 1. We, likewise, do not sustain the rejection of claims 2–33, which recite similar limitations.

§ 103 Rejection

“Section 103 forbids issuance of a patent when ‘the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.’” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007) (“*KSR*”). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) where in evidence, so-called

secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

Appellants argue that the Examiner erred in rejecting claim 1 over the combination of Marpe and Holcomb because, as acknowledged by the Examiner, neither reference teaches or suggests “coding, by the video coder, interleaved information... *such that at least a first portion of the information associated with the y-component of the first motion vector difference value is coded before at least a first portion of the information associated with the x-component of the first motion vector difference value*”. App. Br. 35. Further, Appellants argue that Examiner’s reliance upon *In re Japiske*⁶ as a precedent to switch the coding order of x-component and y-component of motion vector difference values in Holcomb would change the manner of operation of Holcomb, and would not cure the admitted deficiencies of the proposed combination of references. *Id.* at 36–40 (citing Holcomb, Fig. 36, ¶ 186). In particular, Appellants argue that Holcomb’s disclosure in Figure 36 teaches encoding all information related to x-component before encoding any information related to y-component, as opposed to encoding the information in an interleaved manner such that a y-component for a motion vector difference value is encoded before encoding an x-component for the same motion vector difference value. *Id.* at 39–40 (citing Holcomb ¶ 384). This argument is persuasive.

At the outset, we note the Examiner admits the following:

Marpe and Holcomb do not explicitly disclose wherein the interleaved information includes information associated with the x-component of the first motion vector difference value and information associated with the y-component of the first motion vector difference

⁶ *In Re Japiske*, 86 USPQ 70

value such that at least a first portion of the information associated with the y-component of the first motion vector difference value is coded before at least a first portion of the information associated with the x-component of the first motion vector difference value.

Final Act. 18.

The Examiner nonetheless relies upon Holcomb for its teaching of coding the x-component of a motion vector difference value before coding the y-component thereof. Final Act. 16–17 (citing Holcomb ¶ 384, Fig. 36). Further, the Examiner relies upon the *In re Japiske* precedent along with Holcomb’s disclosure of changing the ordering of stages in flow diagrams as a rationale to modify Holcomb’s encoding order of the x and y components of the motion vector difference values. *Id.* at 18–19. According to the Examiner, changing Holcomb’s encoding order of the motion vector differential components would not change the encoding operation of Holcomb’s video encoder. Ans. 65. Notwithstanding the lack of evidence on this record to support this latter assertion, we agree with Appellants that even if the cited portions of Holcomb and Marpe were combined in the manner proposed by the Examiner, the resulting combination would still fail to remedy the noted deficiencies acknowledged by the Examiner. At best, the proposed combination would result in the video encoder encoding all the y-components of the motion vector difference value, then encoding all the x-components thereof. In other words, as persuasively argued by Appellants, the combination would still fall short of teaching the interleaved encoding wherein the video encoder encodes a y-component before encoding an x-component of a same motion vector difference value.

Because Appellants have shown at least one reversible error in the rejection of claim 1, we need not reach Appellants’ remaining arguments.

Appeal 2018-000028
Application 13/536,218

Accordingly, we do not sustain the Examiner's obviousness rejection of independent claim 1. Likewise, we do not sustain the rejection of independent claims 9, 18, and 26, which recites the disputed limitations.

Because claims 2–8, 10–17, 19–25, and 27–33 depend from independent claims 1, 9, 18, and 26 discussed above and necessarily incorporate all of the limitations of their respective base claims, we do not sustain the obviousness rejection of the cited dependent claims for the same reasons.

DECISION

For the above reasons, we reverse the patent ineligibility rejection as well as the obviousness rejections of claims 1–33.

REVERSED