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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JOEL SOLE, XIAOAN LU, PENG YIN, QIAN XU, and YUNFEI ZHENG

Appeal 2017-010220
Application 13/500,119[1]
Technology Center 2400

Before DEBRA K. STEPHENS, DANIEL J. GALLIGAN, and DAVID J. CUTITTA II, *Administrative Patent Judges*.

GALLIGAN, *Administrative Patent Judge*.

DECISION ON APPEAL

Introduction

Appellants appeal under 35 U.S.C. § 134(a) from a final rejection of claims 1–49, which are all of the claims pending in the application. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.[2]

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[1] According to Appellants, the real party in interest is THOMSON LICENSING. Br. 3.

[2] Our Decision refers to Appellants' Supplemental Appeal Brief filed December 17, 2016 ("Br."); Specification filed April 4, 2012 ("Spec."); Examiner's Answer mailed May 5, 2017 ("Ans."); and Final Office Action mailed January 4, 2016 ("Final Act.").

STATEMENT OF THE CASE

Claims on Appeal

Claims 1, 12, 23, 34, and 45 are independent claims. Claim 1 is reproduced below:

> 1. A video encoder comprising:
>
> an adaptive filter for performing filtering of prediction data used to generate an intra prediction for a chroma component of at least a portion of a picture, wherein the filtering is adaptive with respect to at least one of filter parameters for the filtering and whether the filtering is used or bypassed; and
>
> a deblocking filter for filtering prediction data used to generate an inter prediction.

References

Taniguchi	US 5,412,434	May 2, 1995
Kwon	US 2005/0243912 A1	Nov. 3, 2005
Hung	US 2008/0117980 A1	May 22, 2008
He '752	US 2008/0137752 A1	June 12, 2008
He '252	US 2008/0240252 A1	Oct. 2, 2008
Wilkins	US 2010/0061645 A1	Mar. 11, 2010

Examiner's Rejections

Claims 1–11, 23–33, 46, and 48 stand rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter. Final Act. 11–12.

Claims 1–11, 19, 23–33, 41, 46, and 48 stand rejected under 35 U.S.C. § 112, first paragraph as failing to comply with the enablement requirement. *Id.* at 9–11.

Claims 1–11, 23–33, 46, and 48 stand rejected under 35 U.S.C. § 112, second paragraph as being indefinite. *Id.* at 11.

Claims 1, 2, 12, 13, 23, 24, 34, 35, and 45–49 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Wilkins, He '252, Kwon, and Taniguchi. *Id.* at 12–17.

Claims 3–11, 14–22, 25–33, and 36–44 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Wilkins, He '252, Kwon, Taniguchi, He '752, and Hung. *Id.* at 17–29.

Our review in this appeal is limited only to the above rejections and the issues raised by Appellants. Arguments not made are waived. *See* MPEP § 1205.02; 37 C.F.R. §§ 41.37(c)(1)(iv) and 41.39(a)(1).

ANALYSIS

Statutory Subject Matter

The Examiner rejects claims 1–11, 23–33, 46, and 48 under 35 U.S.C. § 101 because the Examiner determines these claims encompass software *per se* and, thus, are not within one of the four classes of statutory subject matter. Final Act. 3, 12; Ans. 15–16. Appellants argue the "claimed 'encoder' and 'decoder' clearly are not 'signals and carrier waves'" because "[s]ignals and carrier waves, unlike encoders and decoders, do not comprise filters, nor are they capable of performing an intra prediction for a chroma component of at least a portion of a picture." Br. 10.

We are not persuaded. A claim that is directed to software and is not otherwise limited to one of the four statutory categories—process, machine, manufacture, or composition of matter—is non-statutory subject matter. *Cf. Microsoft Corp. v. AT&T Corp.*, 550 U.S. 437, 449 (2007) ("Abstract software code is an idea without physical embodiment . . . ."); *In re Warmerdam*, 33 F.3d 1354, 1361 (Fed. Cir. 1994). That is, "software" per se is not within any of the four statutory categories and is not patent-eligible subject matter.

The Specification teaches "the present principles may be implemented

in various forms of hardware, *software*, firmware, special purpose processors, or combinations thereof." Spec. 18:1–3 (emphasis added). The Specification, therefore, teaches that the claimed invention may be wholly software. Accordingly, the encoder, decoder, and associated functionalities recited by the claims subject to this ground of rejection include software implementations, e.g., software encoders, software decoders, and software filters. Further, the claims do not recite any physical structure that stores or executes the software implementation, and, therefore, the claimed software is not directed to any one of the statutory classes, i.e., a process, machine, manufacture or composition of matter. As such, Appellants' argument that encoders, decoders, filters, and their associated functions do not encompass signals and carrier waves (Br. 10) does not persuade us that the claims are directed to one of the four classes of statutory subject matter. Therefore, we sustain the rejection of claims 1–11, 23–33, 46, and 48 under 35 U.S.C. § 101 as directed to non-statutory subject matter.

Indefiniteness

The Examiner rejects claims 1–11, 23–33, 46, and 48 under 35 U.S.C. § 112, second paragraph as being indefinite. In particular, the Examiner determines that the claims recite means-plus-function limitations (Final Act. 8–9) but the Specification does not adequately disclose structure corresponding to those limitations (*id.*), and, as such, the Examiner concludes the claims are indefinite (*id.* at 11). Appellants do not challenge the Examiner's means-plus-function analysis or the merits of the indefiniteness rejection (*see* Br. 8–14); accordingly, we sustain the Examiner's rejection of claims 1–11, 23–33, 46, and 48.

Enablement

Claims 1–11, 23–33, 46, and 48

The Examiner rejects claims 1–11, 23–33, 46, and 48 under 35 U.S.C. § 112, first paragraph because the Examiner concludes the full scopes of the claimed "video encoder," "video decoder," "adaptive filter," and "deblocking filter" are not enabled. Final Act. 10; Ans. 17–18. According to the Examiner, Appellants' arguments "do[] not address the scope of the enablement issues raised by the Examiner (above) when attempting to analyze the claimed 'encoder', 'decoder', and 'filter' and determine if the claimed elements *functionally claimed have corresponding structure*." Ans. 18 (emphasis added). The Examiner's enablement rejection of these claims appears, therefore, to be based on the lack of corresponding structure for means-plus-function limitations. That defect renders the claims indefinite, as noted above. Because we affirm the Examiner's conclusion that the claims lack definiteness, we cannot readily ascertain whether the Specification provides an enabling disclosure commensurate with the scope of those claims. Accordingly, we *pro forma* reverse this rejection of claims 1–11, 23–33, 46, and 48 under 35 U.S.C. § 112, first paragraph as being non-enabled.

Claims 8, 19, 30, and 41

Claim 8 recites "a prediction value . . . is a function of the prediction data and the filtered prediction data," and claims 19, 30, and 41 recite similar limitations. The Examiner further rejects claims 8, 19, 30, and 41 under 35 U.S.C. § 112, first paragraph because the Examiner concludes the claimed "function" is not enabled. Final Act. 10–11; Ans. 13–14.

Appellants argue the "Specification describes several embodiments with ample detail to enable one of ordinary skill in the art to make and/or use the invention." Br. 9 (citing Spec. 13:18–27).

We agree with Appellants. The Specification teaches that the "'prediction value of the prediction data' refers to the actual value that ultimately is used for the prediction data from among two or more candidate values." Spec. 8:6–12. Further, the Specification teaches a prediction value is calculated as "the absolute value of the difference between the filtered value and the non-filtered value is computed." *Id.* at 13:18–27. As such, the Specification has provided direction and a working example explaining how to calculate a prediction value as a "function" of prediction data and filtered prediction data. In light of the direction and examples provided by the Specification, we are not persuaded by the Examiner's determination that undue experimentation would be required in order for one skilled in the art to practice the full scope of the claimed invention because of the breadth of the claims. Ans. 13–14, 17–18.

Accordingly, we do not sustain this rejection of claims 8, 19, 30, and 41 under 35 U.S.C. § 112, first paragraph as being non-enabled.

Obviousness

Claims 12–22 and 34–45, 47, and 49

Appellants contend the Examiner erred in finding He '252 and Kwon teach "performing filtering of prediction data used to generate an intra prediction . . . wherein the filtering is adaptive" as recited in claim 12 and similarly recited in claims 34 and 45. Br. 11–12. Specifically, Appellants argue that, although "He ['252] describes an arrangement involving

deblocking filters, which are used to filter data used for inter prediction," the claims "recite that adaptive filtering is used to filter prediction data used for intra prediction." *Id.* at 11. Appellants further argue "Kwon, like He, is directed to deblocking filtering and does not teach adaptive filtering of prediction data for the intra prediction of a chroma component." *Id.* at 12.

We are not persuaded of Examiner error. Appellants argue neither He '252 nor Kwon teaches the disputed limitation (*id.* at 11–12); however, the Examiner finds Wilkins teaches the disputed limitation — "performing filtering of prediction data used to generate an intra prediction . . . wherein the filtering is adaptive." In particular, the Examiner relies on Wilkins's disclosure of "adaptive loop filter 34" for video encoders and decoders including an "intra-prediction mode" that forms "a prediction macroblock." Ans. 20; Final Act. 13; Wilkins ¶¶ 22, 24, 27; *see* Wilkins Figs. 1–2. Appellants' arguments that He '252 and Kwon do not teach "intra prediction" (Br. 11–12) do not address the Examiner's findings that Wilkins teaches intra prediction (Ans. 20; Final Act. 13). Accordingly, we are not persuaded the Examiner erred in finding Wilkins teaches "performing filtering of prediction data used to generate an intra prediction . . . wherein the filtering is adaptive" as recited in claim 1 and similarly recited in claims 12, 23, 34, and 45.

Appellants further contend the Examiner erred in finding Kwon teaches "performing deblocking filtering of prediction data used to generate an inter prediction," as recited in claim 12 and similarly recited in claims 34 and 45. Br. 12. Specifically, Appellants argue "Kwon's deblocking filter cannot be involved in the filtering of prediction data used to generate any prediction, inter-, intra- or otherwise" because "the deblocking filtering

described in Kwon entails a post processing filter, at the output of the decoder, as opposed to a loop filter." *Id.* (citing Kwon Fig. 3).

We are not persuaded. Contrary to Appellants' assertion that Kwon's deblocking filter is not a loop filter (*id.*), Kwon discloses that "de-blocking filters can be integrated into a video codec as either *a loop filter* or a post filter. Loop filters operate inside the motion compensation loop so that the filtered frames are used as reference frames of subsequent coded frames" (Kwon ¶ 13) (emphasis added) (cited at Ans. 19). Appellants' argument is premised on the assertion that Kwon's deblocking filter is not a loop filter (Br. 12). Kwon, however, teaches embodiments in which its deblocking filter is a loop filter (Kwon ¶ 13); therefore, Appellants do not persuade us of Examiner error.

Accordingly, we are not persuaded the Examiner erred in finding the combination of Wilkins, He '252, Kwon, and Taniguchi teaches or suggests the limitations as recited in independent claims 12, 34, and 45. Additionally, Appellants do not provide separate arguments for claims 13–22, 35–44, 47, and 49 which depend from claims 12, 34, and 45. *See* Br. 12–13. Therefore, we sustain the obviousness rejections of claims 12–22 and 34–45, 47, and 49.

Claims 1–11, 23–33, 46, and 48

Additionally, as discussed *supra*, the Examiner determines that the Specification does not disclose structure corresponding to the means-plus-function limitations recited in claims 1–11, 23–33, 46, and 48. Final Act. 8–9, 11. The Court of Appeals for the Federal Circuit has stated that we must "engage[] in a comparison of the asserted prior art's disclosure to the 'structure' disclosed in the" Specification to assess patentability of means-

plus-function limitations over prior art. *IPCom GmbH & Co. v. HTC Corp.*, 861 F.3d 1362, 1371 (Fed. Cir. 2017), as corrected (Aug. 21, 2017) (citing *In re Donaldson Co., Inc.*, 16 F.3d 1189, 1195 (Fed. Cir. 1994) (en banc)). In this case, neither the Examiner nor Appellants have identified the structure corresponding to the means-plus-function limitations that we would compare with the disclosure of the prior art to assess the obviousness rejection. Indeed, in their Appeal Brief, Appellants do not challenge the Examiner's determination that the Specification does not disclose structure corresponding to the means-plus-function limitations. Accordingly, we *pro forma* reverse the obviousness rejections of claims 1–11, 23–33, 46, and 48.

DECISION

We affirm the Examiner's decision rejecting claims 1–11, 23–33, 46, and 48 under 35 U.S.C. § 101 as being directed to non-statutory subject matter.

We affirm the Examiner's decision rejecting claims 1–11, 23–33, 46, and 48 under 35 U.S.C. § 112, second paragraph as being indefinite.

We reverse the Examiner's decision rejecting claims 1–11, 19, 23–33, 41, 46, and 48 under 35 U.S.C. § 112, first paragraph as failing to comply with the enablement requirement.

We affirm the Examiner's decision rejecting claims 12, 13, 34, 35, 45, 47, and 49 under 35 U.S.C. § 103(a) as being unpatentable over Wilkins, He '252, Kwon, and Taniguchi.

We affirm the Examiner's decision rejecting claims 14–22 and 36–44 under 35 U.S.C. § 103(a) as being unpatentable over Wilkins, He '252, Kwon, Taniguchi, He '752, and Hung.

We reverse the Examiner's decision rejecting claims 1, 2, 23, 24, 46, and 48 under 35 U.S.C. § 103(a) as being unpatentable over Wilkins, He '252, Kwon, and Taniguchi.

We reverse the Examiner's decision rejecting claims 3–11 and 25–33 under 35 U.S.C. § 103(a) as being unpatentable over Wilkins, He '252, Kwon, Taniguchi, He '752, and Hung.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 41.50(f).

AFFIRMED