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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte BO ZHOU, SHU XIAO, JUNCHEN DU, and SUHAIL JALIL

Appeal 2019-000961
Application 13/354,364
Technology Center 2400

Before BRADLEY W. BAUMEISTER, MICHAEL J. STRAUSS, and RUSSELL E. CASS, *Administrative Patent Judges*.

BAUMEISTER, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant appeals under 35 U.S.C. § 134(a) from the Examiner's final rejection of claims 1–21, which constitute all of the pending claims.[1] Appeal Br. 4–13. We have jurisdiction under 35 U.S.C. § 6(b).

The Board conducts a limited *de novo* review of the appealed rejections for error based upon the issues identified by Appellant, and in light of the arguments and evidence produced thereon. *Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential). We AFFIRM.

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[1] Appellant identifies QUALCOMM Incorporated as the real party in interest. Appeal Brief filed August 22, 2018 ("Appeal Br.") 3.

CLAIMED SUBJECT MATTER

Appellant describes the present invention as follows:

> A method for performing texture decoding in a multi-threaded processor includes substantially simultaneously decoding, in multiple hardware threads, at least two macro-blocks of a VP8 frame. Each hardware thread decodes one macro-block at a time. The method may also include assigning a macro-block from the at least two macro-blocks of the VP8 frame to a hardware thread of the multi-threaded processor.

Abstract.

Independent claim 1, reproduced below, illustrates the subject matter of the appealed claims:

> 1. A method for texture decoding in a multi-threaded processor, comprising:
>
> assigning a first macro-block in a first row of a compressed video data format frame encoded in accordance with Internet Engineering Task Force Request For Comment 6386 to a first hardware thread and a second macro-block in a second row of the compressed video data format frame to a second hardware thread, the first row adjacent to the second row; and
>
> simultaneously decoding the first macro-block by the first hardware thread and the second macro-block by the second hardware thread by:
>
> reconstructing the first macro-block and the second macro-block; and
>
> performing loop filtering of the first macro-block and the second macro-block immediately following reconstruction of the first macro-block and the second macro-block before the first hardware thread or the second hardware thread reconstructs additional macro-blocks.

STATEMENT OF THE REJECTIONS

Claims 1–21 stand rejected under 35 U.S.C. § 112, ¶ 1, as failing to comply with the written description requirement. Final Act. 4–5.

Claims 1, 2, 5, 7–11, 13–15, 17, 20, and 21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lee (US 2012/0014451 Al; published Jan. 19, 2012) and Xu (US 2010/0061455 Al; published Mar. 11, 2010). Final Act. 5–9.[2]

Claims 3, 18, and 19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lee, Xu, and Smith (US 8,036,517 B2; published Oct. 11, 2011). Final Act. 9–11.

Claim 4 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Lee, Xu, and Shin (US 2012/0087414 Al; published Apr. 12, 2012). Final Act. 11.

Claims 6 and 16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lee, Xu, and Molloy (US 2006/0050976 Al; published Mar. 9, 2006). Final Act. 12–13.

Claims 12 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Lee, Xu, Smith, and Shin. Final Act. 11–12.

[2] Rather than repeat the Examiner's positions and Appellant's arguments in their entirety, we refer to the above mentioned Appeal Brief, as well as the following documents for their respective details: the Final Action mailed May 1, 2018 ("Final Act."); the Supplemental Examiner's Answer mailed November 2, 2018 ("Ans."); and the Reply Brief filed November 15, 2018 ("Reply Br.").

THE SECTION 112(a) REJECTION

Determinations and Contentions

The Examiner rejects claims 1–21 under 35 U.S.C. § 112, ¶ 1, as failing to comply with the written description requirement because the claims contain subject matter that was not described in the Specification in such a way as to reasonably convey that the inventor had possession of the claimed subject matter at the time of the invention. Final Act. 4. More specifically, the Examiner finds, "[t]he claims require a video data format frame encoded in accordance with 'Internet Engineering Task Force Request for Comment 6386'. However, the applicant's specification makes no mention of incorporating Comment 6386 by reference nor [contains] any description of what encoding according to the Comment entails." Final Act. 4. The Examiner also addresses an assertion presented by Appellant: "The applicant asserts on pg. 8 of the remarks [filed Dec. 14, 2017] that Comment 6386 is also known as the VP8 encoding format, which is mentioned in the specification, however the applicant has not presented any evidence to support this assertion." Final Act. 4–5.

Appellant asserts,

> *The Instant Applicant cites VP8 a video compression format* (See Instant Application, paragraph 2). One of ordinary skill relevant to VP8 video compression would necessarily understand that this video compression format is defined by RFC 6386 as indicated by the title as well as a review of RFC 6386 wherein VP8 is cited and defined. Further, the Examiner cites to Xu wherein Xu states "VPx (promulgated by On2 Technologies, Inc. of Clifton Park, N.Y.)" (See Xu, paragraph 4). *As indicated in the RFC 6386, On2's VP8 is the precursor to RFC 6386*. Xu was filed in 2008, and, as detailed in the Wikipedia reference provided to the Examiner RFC 6386 was not published until 2011 after sale of the rights to VP8 by

> On2. The Appellant submits that VP8 is synonymous with RFC 6386 and citing to one or the other is adequate support for use of both terms especially considering that RFC 6386 is the very standard that defines the VP8 video compression format and only the VP8 video compression format.

Appeal Br. 6.

Analysis

To summarize, Appellant acknowledges that its Specification only discloses the VP8 video compression format—not the RFC 6386 industry standard. Appeal Br. 6. Appellant further states that VP8 is a precursor to RFC 6386. Appeal Br. 6. Restated, Appellant acknowledges that the VP8 compression format and the RFC 6386 are not synonymous.

Accordingly, Appellant effectively acknowledges that its Specification only discloses a protocol that is a precursor to the standard now being claimed—the Specification does not disclose the subsequent standard, itself. Furthermore, Appellant does not explain why, if the terms are synonymous, Appellant chose to recite the undisclosed term in the claims instead of the disclosed term.

We, therefore, affirm the written-description rejection of claims 1–21 under 35 U.S.C. § 112(a).

THE SECTION 103 REJECTIONS

Determinations and Contentions

The Examiner finds that Lee discloses all of the limitations of claim 1 except for the requirement that the macro-block in a first row of a compressed video data format frame is encoded specifically in accordance with Internet Engineering Task Force Request For Comment 6386. Final Act. 5–6. In relation to the claim language not taught by Lee, the Examiner

finds, "Xu discloses decoding frames according to a VP8 encoding format. . . , which the applicant identifies as the format described by IETF Request for Comment 6386." Final Act. 6 (citing Xu. ¶¶ 16, 17). The Examiner further finds that "Xu particularly discloses decoding a VP8 format frame using multi-threaded processors where each processor is assigned a set of macroblock rows for parallel processing." *Id.* at 6–7 (citing Xu ¶¶ 24–27; FIG. 4). The Examiner concludes that it would have been obvious to apply the multi-threaded wavefront parallel processing of Lee so as to comply with the VP8 standard in order to gain the expected advantage of greater standards compliance. *Id.* at 7.

As part of the findings regarding Lee, the Examiner explains how Lee discloses the final limitation of claim 1, which requires "performing loop filtering of the first macro-block and the second macro-block immediately following reconstruction of the first macro-block and the second macro-block before the first hardware thread or the second hardware thread reconstructs additional macro-blocks":

> Lee discloses that processing of a current macroblock depends on previously processed neighboring blocks [that] have been decoded/reconstructed (Lee par. 124). Lee further discloses that the decoding/reconstruction includes deblock filtering (Lee Fig. 7 and par. 116 indicating decoding steps including inverse quantization, inverse discrete cosine transform and adding (reconstruction), culminating in deblocking 716). Thus processing of the current macroblock block cannot be performed until the completion of deblock filtering for the previous macroblock i.e. the left adjacent block as indicated by par. 123 of Lee (Lee macroblocks processed from left to right). Lee further discloses processing blocks in adjacent rows simultaneously, in a 'wavefront' order (Lee Fig. 9 pars 126–127 note simultaneous processing of macroblocks 920, 926[,] and 932). [Because] the next macroblocks to be processed, 928 and

> 934, will depend from blocks, 926 and 932[,] respectively[,] deblock filtering for the next macroblocks cannot begin until the blocks from which the[y] depend have been decoded/ reconstructed[,] which includes deblock filtering. Therefore, contrary to the appellant's assertion, Lee does disclose performing loop filtering on first and second macroblocks immediately following reconstruction and before reconstruction of additional macroblocks.

Ans. 12–13.

Appellant contend that the obviousness rejection is improper for various reasons. Appeal Br. 7–10. For example, in relation to the last limitation, Appellant argues,

> the Examiner alleges that Lee teaches "performing loop filtering of the first macroblock and the second macro-block immediately following reconstruction of the first macro-block and the second-macro block before the first or second hardware thread reconstructs additional macroblocks. . . . The Appellant disagrees. Nothing in Lee specifies that loop filtering is done on each parallel processed macro-block before processing other macro-blocks. The cited paragraphs in Lee merely mention loop processing without specifying when the loop filtering takes place.

Appeal Br. 10.

Appellant further argues,

> nothing in paragraphs 116, 123, 124, 126–127 or Figures 7–9 of Lee discloses which macro-blocks are assigned to which threads. In paragraph 123, Lee merely states that "[e]ach macroblock may use information from the previously encoded macroblock for motion vector prediction, intra prediction, and deblocking." This does not mention when the information is used (before the previous macro-block is loop filtered, for example). Note that Lee also does not mention previously decoded macroblocks[—] only encoded macroblocks[,] nor does Lee mention if the current macroblock is assigned to one of the thread[s] of a loop filtered macroblock. In paragraph 124, Lee only mentions the loop

> filtering related to block 804 and block 808 for the current macroblock 810 dependency and block 808 is not in a row adjacent to macroblock 810 (same row).
>
> Lee does not mention if macroblock 810 is assigned to the same thread as macroblock 804 (or even 802 and 808[,] although loop filtering is not mention[ed] in relation to these particular adjacent row blocks)[,] nor does Lee mention when the threads of the two loop filtered blocks are assigned to additional blocks (i.e. before or after assigning macroblock 810 to one of these threads). As also can be seen in Figure 9 of Lee, the cited macroblocks 920, 926, and 932 are indicated as thread 7 (T7) while the reconstructed blocks are indicates as other than T7. Lee fails to describe when the threads T1–6 are reassigned[,] nor does Figure 9 show a current macroblock using a thread used by a reconstructed macroblock.

Reply Br. 4–5 (formatting modified).[3]

Analysis

Appellant's arguments persuade us of error in the Examiner's obviousness rejection of claim 1. The cited passages of Lee show, to some degree, the order in which Lee reconstructs the macroblocks. But the Examiner does not sufficiently establish that Lee discloses that two macroblocks of adjacent rows are decoded simultaneously.

We, therefore, reverse the Examiner's rejection of claim 1 and of claims 2, 5, 7–11, 13–15, 17, 20, and 21, which either depend from or otherwise include the language of the disputed limitation.[4]

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[3] Appellant only numbers page one of the Reply Brief. We interpret the "REMARKS/ARGUMENTS" section as starting on page two.

[4] We also question whether the Examiner established a sufficient factual basis for why one of ordinary skill in the art, having read Lee, reasonably would have expected Lee's teachings to be capable of being carried out when alternatively using a VP8 protocol, or whether the Examiner's proposed modification was a result of impermissibly using Appellant's

With respect to the remaining rejection of claims 3, 4, 12, 18, and 19, the Examiner does not rely on the additional teachings of Smith, Shin, or Molloy to cure the noted deficiency of the obviousness rejection of claim 1. Final Act. 9–13. We, therefore, reverse the obviousness rejections of these claims for the reasons set forth in relation to independent claim 1.

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	References/ Basis	Affirmed	Reversed
1–21	112, 1st paragraph	Written Description	1–21	
1, 2, 5, 7–11, 13–15, 17, 20, 21	103(a)	Lee, Xu		1, 2, 5, 7–11, 13–15, 17, 20, 21
3, 18, 19	103(a)	Lee, Xu, Smith		3, 18, 19
4	103(a)	Lee, Xu, Shin		4
6, 16	103(a)	Lee, Xu, and Molloy		6, 16
12	103(a)	Lee, Xu, Smith, Shin		12
Overall Outcome			1–21	

claims as a roadmap. But because we reverse the obviousness rejections based on the noted missing claim element, we need not address the sufficiency of the proposed motivation to combine.

TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED