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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* YUNFEI ZHENG, OSCAR DIVORRA ESCODA,  
PENG YIN, and JOEL SOLE

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Appeal 2018-005913  
Application 12/736,463  
Technology Center 2400

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Before JOHN F. HORVATH, NABEEL U. KHAN and  
AMBER L. HAGY, *Administrative Patent Judges*.

KHAN, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant<sup>1</sup> appeals from the  
Examiner's decision to reject claims 1–6, 10–16, 20–26, 30–36, 40 and 41.  
We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

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<sup>1</sup> We use the word Appellant to refer to “applicant” as defined in 37 C.F.R. § 1.42(a). Appellant identifies the real party in interest as Thomson Licensing DTV. Appeal Br. 3.

### CLAIMED SUBJECT MATTER

Appellant describes the invention as relating to “template matching prediction in video encoding and decoding.” Abstract. Specifically, the invention describes an “apparatus [that] includes an encoder (300) for encoding a target block in a picture by determining at least one predictor for the target block and respectively utilizing the at least one predictor as a template to search for at least one additional predictor for the target block.”  
*Id.*

Claim 1, reproduced below, is illustrative of the claimed subject matter:

1. An apparatus, comprising:

an encoder for encoding a target block in a picture by determining a plurality of predictors for the target block and respectively utilizing the plurality of predictors as templates in a template matching prediction process to search for a plurality of additional predictors for the target block, the plurality of predictors being reference blocks in reference pictures and using the additional predictors in a multihypothesis motion compensation prediction process to predict the target block, wherein a template is obtained from one reference picture, and a template matching prediction search is performed in the same reference picture or other reference pictures that are not in a same list of pictures, and

wherein motion vectors can be derived from a motion vector predictor, or can be explicitly sent in the bitstream.

### REFERENCES

The prior art relied upon by the Examiner is:

Name	Reference	Date
Tourapis	US 2007/0009044 A1	Jan. 11, 2007
Boon <sup>2</sup>	WO 2007/125856 A1	Nov. 8, 2007
Tourapis2	US 2004/0001546 A1	Jan. 1, 2004

## REJECTIONS

1. Claims 1, 11, 21, 31 and 41 stand rejected under 35 U.S.C. § 112(b) as indefinite. Final Act. 3–4.
2. Claims 1–6, 11–16, 21–26, 31–36, and 41 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Tourapis and Boon. Final Act. 4–10.
3. Claims 10, 20, 30, and 40 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Tourapis, Boon and Tourapis2.

## OPINION

### *Indefiniteness Rejection*

The Examiner determines that the phrase “can be” in claim 1 renders the claim indefinite because “it is unclear whether the limitations following the phrase are part of the claimed invention.” Final Act. 3. In other words, the Examiner finds that “it is not clear whether the limitations ‘derived from a motion vector predictor’ or ‘explicitly sent in the bitstream’ are part of the claimed invention or not.” Ans. 9. For purposes of continuing the patentability analysis, the Examiner interprets these limitations as affirmatively part of the invention. *See* Final Act. 3 (interpreting the

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<sup>2</sup> The Examiner refers to US 2009/0116760 A1, May 7, 2009 as a translation of WO 2007/125856 A1. Citations to “Boon” herein refer to the translation.

limitation containing the phrase “can be” to mean “wherein motion vectors *are* derived from a motion vector predictor, or *are* explicitly sent in the bitstream”) (emphases added). The Examiner makes clear, however, that this is only one possible interpretation and the claim may be interpreted in multiple ways. For example, the Examiner finds the phrase “can be” may be interpreted so that the limitations following it may or may not be “part of the claimed invention.” Ans. 9. The phrase “can be” may also be interpreted as “able to be” which would entail a different requirement than the other interpretations. *Id.* Finally, the Examiner notes that the ambiguity would allow for various combinations of the above interpretations. *Id.*

Appellant argues the phrase “can be” is taken directly from the Specification and that the interpretation the Examiner adopted for purposes of the rejection is indeed correct. Appeal Br. 8. Appellant points out that the fact that the Examiner was able to interpret the claims indicates that the claims are not indefinite. Appeal Br. 9.

We are unpersuaded by Appellant’s arguments. “A claim is indefinite when it contains words or phrases whose meaning is unclear.” *Ex Parte McAward*, 2017 Pat. App. LEXIS 8537 (PTAB Aug. 25, 2017) (precedential) (citing *In re Packard*, 751 F.3d 1310, 1314 (Fed. Cir. 2014)). During patent examination, if a claim is amenable to two or more plausible claim constructions, it is appropriate for the USPTO to reject the claim as indefinite under 35 U.S.C. § 112, second paragraph, and require the applicant to more precisely define the metes and bounds of the claimed invention. *See Ex parte Miyazaki*, 89 U.S.P.Q.2d 1207, 1211 (BPAI 2008) (precedential). Here, we agree that the term “can be” allows for interpretations that require the limitations that follow “can be” to be

performed and interpretations that do not require those limitations to be performed. In other words, it is unclear whether the claim *requires* the motion vectors to be derived from a motion vector predictor or explicitly sent in the bitstream, or simply *permits* them to be so obtained while also permitting them to be obtained in other, unclaimed ways.

Accordingly we sustain the Examiner's rejection of claims 1, 11, 21, 31 and 41 under 35 U.S.C. § 112(b).

### *Obviousness Rejection*

The Examiner finds Tourapis teaches “an encoder for encoding a target block in a picture by determining a plurality of predictors for the target block, the plurality of predictors being reference blocks in reference pictures” as recited in claim 1. *See* Final Act. 4 (citing Tourapis ¶ 22, Figs. 4, 7) (identifying encoder 700 for encoding block 401/410 of current B-picture using predictors  $BM_{L0}$  from a list 0 reference picture and  $BM_{L1}$  from a list 1 reference picture). The Examiner further finds Boon teaches encoding a target block using a predictor obtained from one reference picture as a template to search for additional predictors in the same or other reference pictures. *Id.* at 5–6 (citing Boon ¶¶ 154–156, 162–165, 168–170, 198, Figs. 4, 6A) (explaining how block 406 in picture 403 is used as a predictor to encode block 402 in picture 401 and as a template to search for additional predictors 601–604 in picture 403 or other pictures).

Appellant argues

no combination of Tourapis or Boon teaches or suggests each and every feature of the pending independent claims because Tourapis discloses a hybrid inter intra bi-prediction scheme, while Boon describes a plurality of predictors. Neither of the references teach or suggest, either alone or in combination, the

plurality of predictors being reference blocks in reference pictures and using the *additional* predictors in a multihypothesis motion compensation prediction process to predict the target block, wherein a template is obtained from one reference picture, and a template matching prediction search is performed in the same reference picture or other reference pictures that are not in a same list of pictures, for example.

Appeal Br. 13.

In particular, regarding the Examiner's reliance on Boon for teaching a template matching process, Appellant argues

Nothing in Boon teaches or suggests that the different frame is in a list that is different than a first list of pictures containing the initial reference frame. Boon does not restrict the search of the first matching template to a frame in a particular list that is then used for a subsequent search of additional predictors, or a subsequent search in another reference frame that is not in the same list as the first frame used to find the initial predictors.

Appeal Br. 13.

Appellant further argues “[n]either Boon nor Tourapis makes any suggestion of using the plurality of predictors as templates to search for a plurality of additional predictors for the target block let alone putting limitations on where to search for the plurality of additional predictors, as in the pending claims.” Appeal Br. 15.

We are unpersuaded by Appellant's arguments. We note that claim 1 recites that “a template matching prediction search is performed in the same reference picture *or* other reference pictures that are not in a same list of pictures.” Appeal Br. 17 (Claims App.) (emphasis added). By using the disjunctive, the claim allows for the template matching search to be performed either “in the same reference picture” or in “other reference pictures that are not in the same list of pictures.” Appellant's arguments that

claim 1 requires the template search to be performed in a reference frame that is not in the same list as the reference frame from which the template was obtained, or that Boon does not restrict the search for a first predictor (template) to a frame in a first list and additional predictors (matching templates) to frames in another list, is not commensurate with the scope of claim 1.

As discussed above, the Examiner finds, and we agree, that Boon discloses an inter-frame prediction method that uses current predictor 406 as a template for performing template matching to find a plurality of matching texture signals, which the Examiner interprets as the claimed “additional predictors.” Answer 11–12 (citing Boon, Figs. 6A, 6B, ¶¶ 154–156). The Examiner finds Boon teaches utilizing predictor 406 to find the additional predictors in the same reference image, and also in different reference images. Answer 12 (citing Boon ¶¶ 163, 164, 168, 198). We determine the Examiner’s findings sufficiently demonstrate that Boon teaches “wherein a template is obtained from one reference picture, and a template matching prediction search is performed in the same reference picture or other reference pictures that are not in a same list of pictures.”

Moreover, even if we were to assume that claim 1 requires the predictors used as templates and the additional predictors (matching templates) to be obtained from different reference pictures in different lists, we would still find Appellant’s arguments to be unpersuasive because they do not address the Examiner’s findings as a whole. It is well established that one cannot show nonobviousness by attacking references individually where the rejections are based on a combination of references. *See In re Keller*,

642 F.2d 413 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091 (Fed. Cir. 1986).

Appellant focuses on Boon as not restricting the template matching search to obtaining a predictor from a first frame in a first list, and using that predictor as a template to search for additional predictors (matching templates) in a second frame that is not in the first list. Appeal Br. 13. The Examiner, however, relies on Tourapis for teaching obtaining predictors from reference frames in two different lists. Ans. 10. The Examiner finds that Tourapis

discloses bi-predictive **inter coding** using two (temporal) predictions BML0 and BML1 that are used for the current macroblock 410 (mislabeled as 401 in Fig. 4). Thus, BML0 and BML1 are predictors for the current macroblock. As illustrated, BML0 is a reference block in a reference List 0 Reference and BML1 is another reference block in another reference List 1 Reference.

Ans. 10 (citing Tourapis ¶ 22, Fig. 4). The Examiner explains that “Tourapis already discloses List 0 and List 1 references from which predictors BML0 and BML1” are obtained. Ans. 13. This teaching, combined with Boon’s teaching of using predictors to search for additional predictors either in the same reference frame or different reference frames, would teach one of ordinary skill in the art that Boon’s different reference frames could be in a list that is different from the list of pictures containing the reference frame from which the initial predictor was obtained.

Accordingly, we sustain the Examiner’s rejection of claim 1 and of claims 2–6, 11–16, 21–26, 31–36, and 41, which were argued together with claim 1. *See* Appeal Br. 11–15. We also sustain the Examiner’s rejection of

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claims 10, 20, 30, and 40, for which Appellant relies on the same arguments addressed above. *See* Appeal Br. 15.

### DECISION SUMMARY

In summary:

<b>Claims Rejected</b>	<b>35 U.S.C. §</b>	<b>Reference(s)/Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
1, 11, 21, 31 and 41	112(b)	Indefiniteness	1, 11, 21, 31 and 41	
1-6, 11-16, 21-26, 31-36, 41	103(a)	Tourapis, Boon	1-6, 11-16, 21-26, 31-36, 41	
10, 20, 30, and 40	103(a)	Tourapis, Boon and Tourapis2	10, 20, 30, and 40	
<b>Overall Outcome</b>			1-6, 10-16, 20-26, 30-36, 40 and 41	

### 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). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED