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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MORITZ HARTENEK

Appeal 2018-008988
Application 14/377,852
Technology Center 2400

Before JAMES R. HUGHES, JUSTIN BUSCH, and
STEPHEN E. BELISLE, *Administrative Patent Judges*.

BUSCH, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant[1] appeals from the Examiner's decision to reject claims 9–16, which constitute all the claims pending in this application. We have jurisdiction over the pending claims under 35 U.S.C. § 6(b).

We AFFIRM.

[1] We use the word "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as Rohde & Schwarz GmbH & Co. KG. Appeal Br. 2.

CLAIMED SUBJECT MATTER

Appellant's disclosure generally "relates to a method for avoiding an error detection of control channels in a mobile-radio device and a device for generating and transmitting control signals to a mobile-radio device on control channels." Spec. ¶ 2. The claimed invention relates to generating a dummy check value that is all zeroes using a filler data sequence when no bit sequence is present for a control channel signal, which results in user equipment (UE) receiving a negative result (no match) when evaluating the check value so the UE rejects or discards the control channel signal. *See* Spec. ¶¶ 2–3, 14–15. Claims 9 and 13 are independent. Claim 9 is reproduced below:

> 9. A method comprising:
>
> generating a control channel signal based on a final check-value appended to a control channel data sequence, wherein (i) when a bit sequence is present for a mobile radio device, the control channel data sequence is based on the bit sequence and the final check-value is generated based on a check-value of the bit sequence generated based on a cyclical redundancy check implemented in the form of a polynomial division, and (ii) when the bit sequence is not present for the mobile radio device, the control channel data sequence is based on a filler data sequence, the final check-value is generated based on a check-value of the filler data sequence and the final check-value is composed of all zeros;
>
> transmitting the control channel signal to the mobile radio device over a control channel of a wireless communications network; and
>
> receiving, by the mobile radio device, the transmitted control channel signal, decoding the final check-value based on a code allocated to the mobile radio device, and performing a check-value evaluation based on the decoded final check-value; and
>
> wherein, when the final check-value was generated based on the check-value of the bit sequence, the check-value

evaluation leads to a positive result and the mobile radio device accepts the control channel signal,

wherein, when the final check-value was generated based on the check-value of the filler data sequence, the decoding of the final check-value based on the code allocated to the mobile radio device provides a non-zero result, and the check-value evaluation leads to a negative result and the mobile radio device rejects the control channel signal.

REJECTIONS

Claims 9–11, 13, 14, and 16 stand rejected under 35 U.S.C. § 103 as obvious in view of Papasakellariou (US 2011/0171985 A1; July 14, 2011), Frederiksen (US 2012/0287880 A1; Nov. 15, 2012), 3rd Generation Partnership Project; Medium Access Control (MAC) protocol specification (Release 10) 3GPP TS 36.321 V10.4.0 (2011-12) (Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA)) (hereinafter 3GPP), and Kumar (US 2012/0173952 A1; July 5, 2012). Final Act. 3–7.

Claims 12 and 15 stand rejected under 35 U.S.C. § 103 as obvious in view of Papasakellariou, Frederiksen, 3GPP, Kumar, and Applicant Admitted Prior Art. Final Act. 7–8.

ANALYSIS

We have reviewed the Examiner's rejections in light of Appellant's arguments that the Examiner erred. In reaching this decision, we have considered all evidence presented and all arguments Appellant made. Arguments Appellant could have made, but chose not to make in the Briefs, are deemed waived. *See* 37 C.F.R. § 41.37(c)(1)(iv). Appellant argues the rejection of all pending claims as a group. *See* Appeal Br. 13 (arguing claims 9–22, 13, 14, and 16 are patentable based on the arguments presented with

respect to independent claims 9 and 13), 14 (arguing AAPA does not cure the alleged deficiencies and, therefore, claims 12 and 15, which depend directly from claims 9 and 13, respectively, are allowable for the reasons presented with respect to independent claims 9 and 13). We select claim 9 as representative. *See* 37 C.F.R. § 41.37(c)(1)(iv).

The Examiner finds the combination of Papasakellariou, Frederiksen, 3GPP, and Kumar teaches or suggests every limitation recited in representative claim 9. Final Act. 3–6. Of particular relevance to this Appeal, the Examiner finds Papasakellariou teaches or suggests "generating a control channel signal based on a final check-value appended to a control channel data sequence, wherein (i) when a bit sequence is present for a mobile radio device, the control channel data sequence is based on the bit sequence and the final check-value is generated based on a check-value of the bit sequence." Final Act. 3 (citing Papasakellariou ¶¶ 13–16). The Examiner also finds Papasakellariou teaches or suggests generating the check value of the bit sequence "based on a cyclical redundancy check" and a UE performing a CRC check on that value to determine whether the bit sequence is intended for that UE. Ans. 3 (citing Papasakellariou ¶¶ 15–17). The Examiner further finds Kumar expressly discloses generating a CRC check value using polynomial division. Final Act. 4 (citing Kumar ¶¶ 6–9); Ans. 4 (citing same). The Examiner concludes the combination of Papasakellariou and Kumar teaches or suggests "the final check-value is generated based on a check-value of the bit sequence generated based on a cyclical redundancy check implemented in the form of a polynomial division." Final Act. 3–4.

Appellant acknowledges Papasakellariou "discloses the generation of a cyclical redundancy check code by computing a CRC of the non-coded

DCI format bits," but Appellant asserts Papasakellariou "is silent as to any disclosure or suggestion of the generation of a check-value of the bit sequence based on a cyclical redundancy check implemented in the form of a polynomial division." Appeal Br. 8–9. Appellant then asserts that, although Kumar may suggest generating a check value based on a CRC implemented in the form of a polynomial division, Kumar does not teach or suggest applying this "concept in the context of control data channels of a mobile wireless communications network, or the reduction of error detections in such mobile radio network control channels," as addressed in Appellant's invention. Appeal Br. 11; *see also* Reply Br. 4 (arguing Kumar "lacks any indications or suggestions whatsoever regarding wireless radio networks"). Appellant argues Kumar, therefore, is not analogous art because Kumar is neither in the same field of endeavor as the invention nor reasonably pertinent to the problem addressed by the invention. Appeal Br. 11; Reply Br. 4–5. Appellant next asserts Frederiksen "lacks any specific disclosure of any method for computing the CRC, and instead specifies the physical downlink control channels payload is used to calculate the CRC parity bits according to a computation set out at Section 5.1.1 of 3GPP TS 36.212." Appeal Br. 12 (citing Frederiksen ¶ 48). Finally, Appellant contends 3GPP teaches computing a CRC by generating "parity bits via one of four specified cyclic generator polynomials. *See 3GPP TS 36.2112, ver. 8.7.0*, at § 5.1.1." Appeal Br. 12 (citing 3GPP § 5.1.1).

We are not persuaded by Appellant's arguments. To the extent Appellant argues Papasakellariou does not teach generating a check value based on a polynomial, this argument does not address the actual rejection. As the Examiner notes, Ans. 4, the Examiner finds the *combination* of Papasakellariou and Kumar teaches "the final check-value is generated

based on a check-value of the bit sequence generated based on a cyclical redundancy check implemented in the form of a polynomial division." Specifically, the Examiner finds Papasakellariou teaches or suggests generating a final check value based on a check value of the bit sequence generated based on a CRC and Kumar discloses one well-known method of calculating a CRC check value uses polynomial division. Final Act. 3–4 (citing Papasakellariou ¶¶ 15–17; Kumar ¶¶ 6–9); Ans. 3–4 (citing same); *see also* Kumar ¶ 2 ("A cyclic redundancy check (CRC) is a common method for adding information to communication packets to detect errors"); Frederiksen ¶ 55 (at least suggesting the use of polynomials in generating and extracting CRC values by explaining that when "'good' CRC-polynomials are chosen, . . . the probability to detect an invalid packet as valid decreases monotonically as the SNR increases").

We also find unpersuasive Appellant's argument that Kumar is non-analogous art. The question of whether a person of ordinary skill in the art would look to a reference—i.e., whether a reference is analogous art—asks whether the particular reference is analogous to Appellant's claimed subject matter. More specifically, prior art is analogous art to the claimed invention if either (1) the art is from the same field of endeavor as the claimed invention (even if it addresses a different problem); or (2) the art is reasonably pertinent to the problem faced by the inventor (even if it is not in the same field of endeavor as the claimed invention). *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004) (emphasis added); *see also Bigio*, 381 F.3d at 1325 (explaining that the first test "requires the PTO to determine the appropriate field of endeavor by reference to explanations of the invention's subject matter in the patent application, including the embodiments, function, and structure of the claimed invention."). We are mindful that the

Supreme Court's decision in *KSR International Co. v. Teleflex, Inc.*, 550 U.S. 398, 402 (2007), directs us to construe the scope of analogous art broadly, stating that "familiar items may have obvious uses beyond their primary purposes, and a person of ordinary skill often will be able to fit the teachings of multiple patents together like pieces of a puzzle." *See Wyers v. Master Lock Co.*, 616 F.3d 1231, 1238 (Fed. Cir. 2010).

The field of endeavor of Appellant's invention involves network communications including CRC checks. Spec. 1:12–3:5. Appellant's invention attempts to avoid error detections (related to check values of CRC checks) resulting from control channels transmitting even when no information needs to be transmitted. Spec. 2:4–31. Kumar "relates generally to communications networks and, more specifically, to cyclic redundancy checks for communications networks." Kumar ¶ 1; *see* Kumar, Fig. 5 (depicting a communication system including transmitters and receivers that implement cyclic redundancy checks). Kumar explains that a "cyclic redundancy check (CRC) is a common method for adding information to the communication packets to detect errors." Kumar ¶ 2.

Appellant distinguishes the focus of Kumar's invention (i.e., providing "a parallel CRC computation approach for parallel input data having data enables- parallel data words of varying sizes") from Appellant's alleged inventive focus on "reducing error detections in a wireless radio control channel." Appeal Br. 11; Reply Br. 4. This distinction does not address Kumar's *field of endeavor*, which is much broader than the particular point of allegedly novelty within that field. We also disagree with Appellant's unsupported assertions that Kumar discloses using polynomials for generating CRC check values without "regard or relation to mobile radio networks in general" and Kumar "lacks any indications or suggestions

whatsoever regarding wireless radio networks." Reply Br. 4; *see* Appeal Br. 11. Because Kumar relates to error checking within communications network and Appellant's invention is directed to improvements focused on avoiding error detection by modifying how CRC check values are determined and processed, we are not persuaded Kumar is in a different field of endeavor than Appellant's invention.

Moreover, as Appellant notes, prior art is "reasonably pertinent" when it would "logically . . . commend[ ] itself" to an inventor's attention in considering the problem the inventor faced. *In re Icon Health & Fitness, Inc*., 496 F.3d 1374, 1379–80 (Fed. Cir. 2007) (citing *In re Clay*, 966 F.2d 656, 658–59 (Fed. Cir. 1992)); *see* Appeal Br. 11 (citing MPEP § 2141.01(a)); Reply Br. 4–5. Appellant's invention recites that "a cyclical redundancy check [is] implemented in the form of a polynomial division." Thus, although not the focus of the claimed invention, one problem addressed by Appellant's invention was implementing a CRC. *See* Spec. 10:3–6 (the only reference in the Specification to polynomial division, which explains that the CRC may be implemented as "a polynomial division or an XOR operation" without additional detail).

Notably, the Examiner relies on Kumar for the limited purpose of demonstrating that implementing CRCs using polynomial division was a well-known CRC method in network communications. Final Act. 4; Ans. 4. Kumar is reasonably pertinent to a problem addressed by the inventor because both Kumar and Appellant's invention addresses a method of generating a CRC check value. Accordingly, we are persuaded Kumar is analogous art based on both prongs of the analogous art test, and that a person of ordinary skill in the art would have found Kumar's CRC method

to be similarly used to provide one technique for generating a CRC check value disclosed in Papasakellariou.

For the above reasons, on this record, we are not persuaded the Examiner erred in rejecting representative claim 9 as obvious in view of the combination of Papasakellariou, Frederiksen, 3GPP, and Kumar. As noted above, Appellant does not argue claims 10–16 separately with particularity. Therefore, for the same reasons, we are not persuaded the Examiner erred in rejecting claims 10, 11, 14, and 16 as obvious in view of the combination of Papasakellariou, Frederiksen, 3GPP, and Kumar or in rejecting claims 12 and 15 as obvious in view of the combination of Papasakellariou, Frederiksen, 3GPP, Kumar, and AAPA.

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	References	Affirmed	Reversed
9–11, 13, 14, 16	103	Papasakellariou, Frederiksen, 3GPP, Kumar	9–11, 13, 14, 16	
12, 15	103	Papasakellariou, Frederiksen, 3GPP, Kumar, AAPA	12, 15	
Overall Outcome			9–16	

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