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Paper 63
Date: July 23, 2020

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SIRIUS XM RADIO INC.,
Petitioner,

v.

FRAUNHOFER-GESELLSCHAFT ZUR FŐRDERUNG DER ANGEWANDTEN FORSCHUNG E.V.,
Patent Owner.

Case IPR2018-00690
Patent 6,314,289 B1

Before JEFFREY S. SMITH, STACEY G. WHITE, and MICHELLE N. WORMMEESTER, *Administrative Patent Judges*.

SMITH, *Administrative Patent Judge.*

Final Written Decision
35 U.S.C. § 318(a)

I. INTRODUCTION

Petitioner filed a Petition requesting *inter partes* review of claims 1–15, 17–33, and 35 of U.S. Patent No. 6,314,289 B1 ("the '289 patent," Ex. 1001). Paper 1 ("Pet."). Patent Owner filed a Preliminary Response. Paper 12. Petitioner filed a Reply to the Preliminary Response, and Patent Owner filed a Sur-Reply. Papers 13, 15. We instituted an *inter partes* review as to all challenged claims and on all grounds raised in the Petition. Paper 29 ("Inst. Decision"). Patent Owner filed a Response. Paper 34 ("PO Resp."). Petitioner filed a Reply, and Patent Owner filed a Sur-Reply. Papers 37 ("Pet. Reply"), 42 ("PO Sur-Reply"). A hearing was held on May 19, 2020 and a transcript was entered into the record. Paper 62 ("Tr.").

A. Related Matters

The parties state that the '289 patent is the subject of *Fraunhofer-Gesellschaft Zur Főrderung der angewandten Forschung e.V. v. Siruis XM Radio Inc.*, No. 1:17-cv-00184-JFB-SRF (D. Del. 2017). Pet. 2–3; Paper 4, 1.

B. Real Parties in Interest

Petitioner identifies itself and Sirius XM Holdings Inc. as the real parties in interest. Pet. 2, Papers 23, 28. Patent Owner identifies itself as the real party in interest. Paper 4.

C. The '289 Patent

The '289 patent relates to concepts for digital broadcasting suited for fading channels for wireless communication. Ex. 1001, 1:7–10. Figure 1 of the '289 patent is reproduced below.

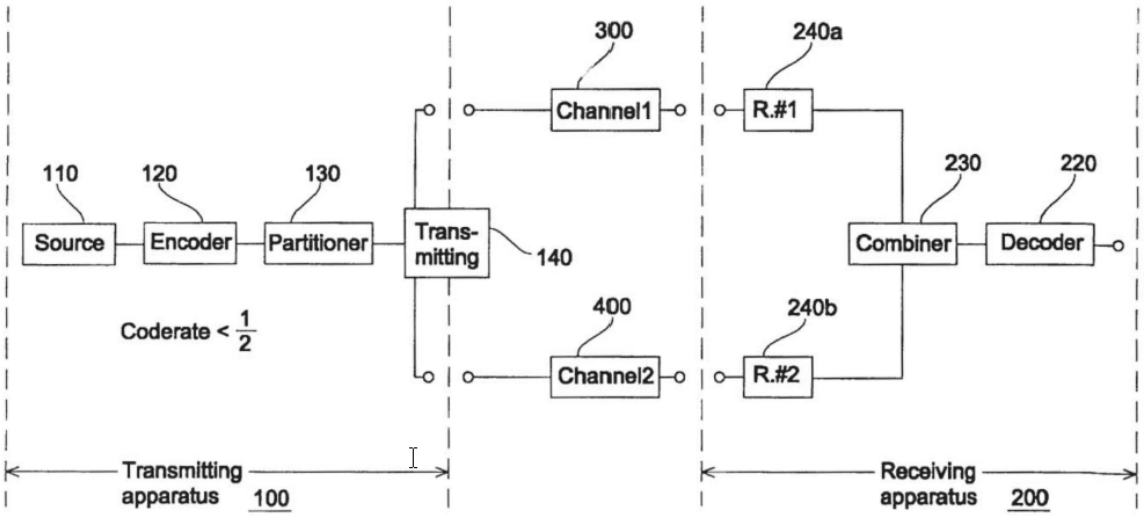

Fig. 1

Figure 1 above shows a block diagram of transmitting apparatus 100 and receiving apparatus 200. *Id.* at 7:14–16. Transmitting apparatus 100 includes bitstream source 110, redundancy adding encoder 120, and partitioner 130. *Id.* at 7:16–18. Encoder 120 is set to output at least twice as many output bits as the number of input bits from bitstream source 110, such that the output bits can be divided into a first portion and a second portion. *Id.* at 7:22–38. Each portion of output bits individually allows the retrieval of information represented by the input bits, such that decoder 220 located in receiving apparatus 200 is able to retrieve the input information when only one channel, such as channel 1 or channel 2, provides a useful signal. *Id.* at 7:38–45.

Figure 3, reproduced below, shows an example of transmitting apparatus including encoder 120, puncturing unit 125, and partitioner 130.

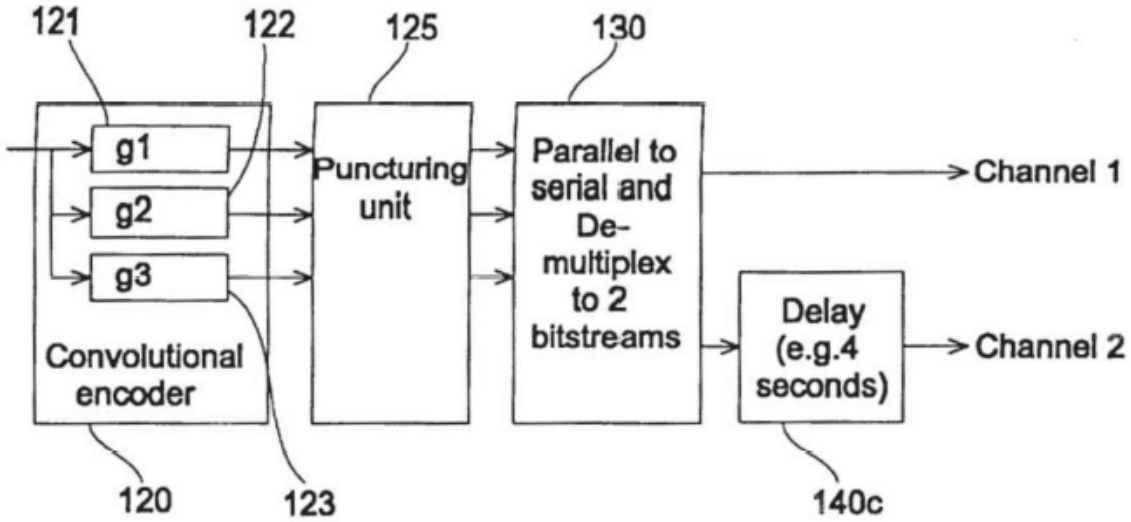

Fig. 3

Figure 3 above shows encoder 120 implemented as a convolutional encoder with three generator polynomials, g1, g2, and g3. *Id.* at 8:46–54. The functionality of the convolutional encoder is shown in Figure 4, reproduced below.

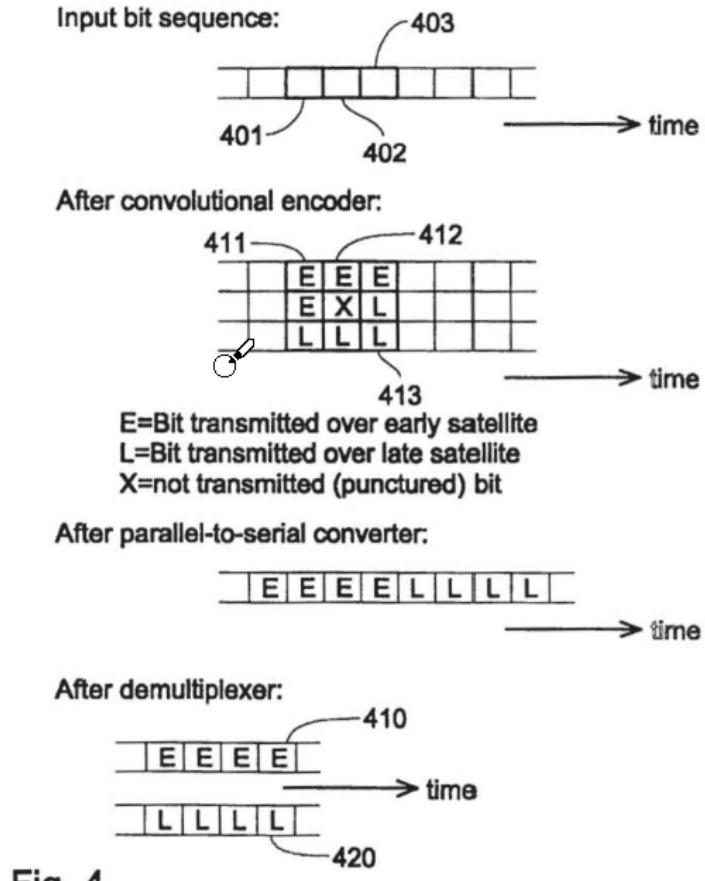

Fig. 4

Figure 4 above shows an input bitstream of three input bits, 401, 402, and 403 encoded into an output of eight bits. *Id.* at 9:7–8. The code rate shown in Figure 4 is 3/8, which means that for three input bits, eight output bits are produced. *Id.* at 7:20–35. For each input bit, convolutional encoder 120 produces three parallel output bits 411, 412, and 413. *Id.* at 9:8–11. The output bits labeled "E" are transmitted early and the output bits labeled "L" are transmitted late, after a delay (such as 140c shown in Figure 3). *Id.* at 9:13–17. The X bit is not transmitted. *Id.* at 9:17.

The encoded bits are processed by puncturing unit 125 and partitioner 130, to produce a first portion of output bits 410 and a second portion of output bits 420. *Id.* at 9:17–37. The first portion of output bits is encoded in a different way than the second portion of output bits. *Id.* at

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