

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
ZTE(USA) INC.
Petitioners

v.

INVT SPE LLC
Patent Owner

Case No. 2018-01474
U.S. Patent No. 7,206,587

**PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 7,206,587**

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I. INTRODUCTION

Petitioners Apple Inc. and ZTE (USA) Inc. (collectively “Petitioners”) request an *Inter Partes* Review (“IPR”) of claims 3 and 4 (collectively, the “Challenged Claims”) of U.S. Patent No. 7,206,587 (“the ’587 Patent”). ’587 Patent (Ex. 1001).

II. SUMMARY OF THE ’587 PATENT

A. Description of the alleged invention of the ’587 Patent

The ’587 Patent generally describes a “cellular communication system” in which channel/reception quality between a base station and handset is measured by the handset and reported back to the base station as a means of selecting an efficient “transmission rate . . . according to the downlink channel quality.” ’587 Patent (Ex. 1001) at 1:9-26. The handset “estimates the downlink channel quality” as a CIR (desired carrier to interference ratio) value and “transmits the result to the base station.” *Id.* at 1:30-41.

The ’587 Patent notes that feedback signals can be “represented by numbers from 1 to N, with a higher number indicating a proportionally better downlink channel quality.” *Id.* at 1:53-56. But there is a risk that communications will slow or cease if the communication mode selected by the handset is not properly interpreted by the base station. *Id.* at 2:14-22 (“[I]f the communication mode determined by a communication terminal is received erroneously by the base

station due to deterioration of the channel conditions . . . , the base station will transmit data using that erroneous mode” such that “the communication terminal cannot demodulate or decode the data.”).

To prevent such communication breakdowns, the ’587 Patent discloses methods for providing channel quality feedback that is less susceptible to errors. In an embodiment relevant to the Challenged Claims, the ’587 Patent teaches that the CIR value can be represented by a plurality of digits/bits including an upper digit and a lower digit, e.g., 8.7 dB—where “8” is the upper digit and “7” is the lower digit. *Id.* at 19:34-58. A key premise of the ’587 Patent’s proposed solution is that it is more important to accurately convey the upper digit than the lower digit. For example, misinterpreting 8.7 as 8.6 is a much less impactful than misinterpreting 8.7 as 9.7. *Singer Decl.* (Ex. 1003) at ¶¶ 56-58.

Accordingly, in one embodiment, the ’587 Patent proposes encoding the upper digit with more bits than the lower digit to create a longer code length for the upper digit comparatively to the lower digit. *Id.* at 20:33-67 (“The 6-bit coding section 1203 converts the value output from the upper digit information generation section 1201 (here, ‘8’) to a 6-bit code word” and the “4-bit coding section 1204 converts the value output from the lower digit information generation section 1202 (here, ‘7’) to a 4-bit code word.”). As the ’587 Patent explains, “a code word represented by 6 bits is less susceptible to being mistaken for another code word

than a code word represented by 4 bits. That is to say, in this embodiment, the value of the upper digit of a CIR value is less susceptible to errors.” *Id.* at 21:15-20.

B. Summary of the prosecution history of the ’587 Patent

The application that resulted in the ’587 Patent was filed on Dec. 18, 2002 as U.S. Patent Application No. 10/321,623 (“the ’623 Application”). ’587 *Patent* (Ex. 1001). The ’623 Application is a continuation of U.S. Patent Application No. 10/089,605 (“the ’605 Application”), which issued as U.S. Patent No. 6,760,590 (“the ’590 Patent”). *Id.* The PCT application that resulted in the ’590 Patent was filed on April 2, 2001 as PCT/JP01/06654. ’590 *Patent* (Ex. 1001). The ’590 Patent and ’587 Patent claim priority to two separate Japanese priority filings—JP2000-234420 (“the ’430 Application”), dated Aug. 2, 2000, and JP2000-285405 (“the ’405 Application”), dated Sep. 20, 2000. *Id.* All prior art references relied on by Petitioners in this Petition are prior art regardless of which Japanese priority filing Patent Owner is entitled, if either. To the extent Patent Owner attempts to swear behind any prior art reference on the basis of one or more priority filings, Petitioners may demonstrate the priority filings fail to support the Challenged Claims.

After a number of Office Actions and a Restriction Requirement, only four claims ultimately issued in the ’587 Patent. The relevant portion of the prosecution

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