

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HEWLETT PACKARD ENTERPRISE COMPANY and CISCO SYSTEMS,
INC.,
Petitioners,

v.

COBBLESTONE WIRELESS, LLC,
Patent Owner.

U.S. Patent 7,924,802
Issue Date: April 12, 2011

Title: WIRELESS COMMUNICATIONS SYSTEMS AND METHODS

Inter Partes Review No.: 2024-00707

**PETITIONERS' REPLY TO PATENT OWNER'S
PRELIMINARY RESPONSE**

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Patent Owner (“PO”) asks the Board to redefine “center frequency” as “the carrier signal frequency the baseband signal is upconverted to,” despite the Challenged Claims making no reference to baseband signals or up-conversion. PO’s construction is wrong because it diverts from the plain and ordinary meaning and attempts to import limitations from the specification. However, because Petitioners two Grounds (*i.e.*, IEEE 802.11n D2.0 (“Draft.11n”) and Shearer) each teach transmission of two frequency ranges each with a center frequency that is “the carrier signal frequency the baseband signal is upconverted to,” the Board need not construe “center frequency” because both Grounds invalidate under both a plain and ordinary reading and PO’s proposed construction.

1. PO’s Proposed Construction Attempts to Improperly Import Limitations from the Specification to Narrow the Definition of “Center Frequency”

Because lexicography and disavowal do not apply, PO tries to import from the specification the concept of an up-converted baseband signal. The concept of up-conversion and/or up-convertors is present in all of the claims that are not challenged (*i.e.*, claims 10-24), but is noticeably absent from all of the Challenged Claims (*i.e.*, claims 1-9). Yet, PO tries to impermissibly import that concept and argues that the specification describes embodiments in which the center frequency is a carrier signal frequency to which the baseband signal is up-converted. POPR at *passim*. “It is [] not enough that the only embodiments, or all of the embodiments, contain a particular limitation. We do not read limitations from the specification into claims; we do not

redefine words. Only the patentee can do that. To constitute disclaimer, there must be a clear and unmistakable disclaimer.” *Thorner v. Sony Computer Entertainment America LLC*, 669 F.3d 1362, 1366-67 (Fed. Cir. 2012). There is no such disclaimer.

The specification refers to up-converting baseband signals to center frequencies in several embodiments, but the applicant never defines or limits the claimed “center frequency” in those terms. Nor does the applicant define the invention as requiring a first and second center frequency that have been up-converted from a baseband signal. Instead, the applicant uses permissive language (“may”) throughout the specification when referring to up-conversion of a baseband signal. Likewise, the applicant also discloses an embodiment in which center frequencies are shifted within the frequency bandwidth of the power amplifier, which can include post-up-conversion shifting, *e.g.*, “. . . a new frequency content 410 in which the signal 401 has moved in frequency as illustrated by signal 411 having an RF center frequency 413” EX-1001 at 7:29-31. In this embodiment, the center frequency may not be the carrier signal frequency to which the baseband signal was up-converted, *i.e.*, signal 401.

PO’s reliance on Professor Cooklev’s Declaration does not save its argument. While Dr. Cooklev opines that the use of two center frequencies “is a major focus of the invention” (EX-2001 at ¶ 44), his opinion does not support PO’s construction. The Challenged Claims require two center frequencies (one being higher than the other) and, therefore, center frequencies are part of the claimed invention. But that fact does

not justify departing from the plain and ordinary meaning of center frequency, which is a frequency at the middle of the frequency range. *See, e.g.*, EX-1004, § 20.3.7 (description of signal, including center frequency f_c); EX-1005, § 14.6.14.4 (“... channel centered on the transmitter center frequency.”). Dr. Cooklev does not opine that a POSITA would understand the plain and ordinary meaning of center frequency to be other than the middle frequency of a frequency range.

2. Center Frequency Need Not Be Construed Because Draft.11n and Shearer Teach a First/Second Center Frequency Using PO’s Construction

PO makes three overlapping arguments as to why Petitioners’ prior art does not teach two center frequencies according to PO’s proposed construction. The foundation of PO’s arguments is that the Challenged Claims require a separate baseband and separate up-conversion for each frequency range and center frequency, which is not supported legally or factually. Neither the claims, nor PO’s proposed construction actually require separate basebands and up-conversion for each center frequency. Instead, PO’s construction only requires that the center frequency be the carrier signal that has been up-converted from a baseband signal. PO’s proposed construction covers the result of a baseband signal that was up-converted; not the way it is up-converted.

- i. Argument 1: Draft.11n discloses one 40MHz channel up-converted from one baseband signal by one up-converter. POPR at 19- 24.

Draft.11n discloses transmission using two 20MHz frequency ranges, each having a center frequency that was up-converted from a baseband signal. Pet., pp. 28-36. As Dr. Negus explains with explicit reference to equations 20-60 & 20-61, and

other sections of the standard defining certain variables, the draft standard discloses how to calculate the two center frequencies – one for each 20 MHz frequency range. EX-1003, ¶¶ 279-286; ¶¶ 304-307. Moreover, both equations identify the two center frequencies $(-)\Delta_F$ and $(+)\Delta_F$ that are calculated during the process of up-converting the baseband signal to carrier signals. *Id.*, pp. 279 and 280. PO and Dr. Cooklev argue that § 20.3.4 and equation 20-1 allegedly show there is only one center frequency. POPR, pp.13-14; EX-2001, ¶ 57. They conveniently ignore § 20.3.8 (EX-1004, p. 267): “in the upper/lower 20 MHz of a 40 MHz channel” the “mathematical definition of transmission shall follow that of a 20 MHz channel with f_c in Equation (20-1) replaced by $f_c \pm 10$ MHz”, *i.e.*, two center frequencies at “+10” / “-10.” EX-1003, ¶ 101. Whether these two center frequencies and their associated frequency ranges were up-converted by one or more up-convertors from one or more baseband signals is not relevant to whether the Challenged Claims are unpatentable. PO’s construction only requires that the carrier signal frequency be an up-converted baseband signal, which Dr. Negus explains is taught by the art and would be obvious to a POSITA. EX-1003, ¶¶ 299, 322.

- ii. Argument 2: Draft.11n discloses one 40MHz channel with a single spectral mask that has “a small dip in the middle of the frequency profile” and lacks two center frequencies. *Id.* at 24-33.

Likewise, PO’s mischaracterization of the two frequency ranges as being one channel with a small dip in the middle and having a “fabricated frequency mask”

contrived by Dr. Negus is incorrect. Dr. Negus explains the origin of his annotations on pages 95, 96 and 99 of his declaration. Likewise, he explains that neither his annotated figure (page 99) nor Fig. 5.5 from Perahia is a “frequency mask” for a single channel, as PO would have this Board believe. Instead, the annotated figures reflect transmit spectral densities for the two frequency ranges transmitted using Draft.11n’s HT or Non-HT Duplicate formats. EX-1003, ¶¶ 290-293. Moreover, the area in these figures to which PO refers as the “the small dip” actually reflects the intersection of the two separately processed signals, each of which spans their own frequency range and has their own center frequency, as disclosed in Draft.11n and Perahia. *Id.*

- iii. Argument 3: Applying Argument 1 to Shearer and arguing Shearer discloses a 40MHz channel, rather than two 20MHz channels, because two baseband signals are aggregated before being up-converted. *Id.* at 34-40.

Similarly, Dr. Negus explains why and how Shearer discloses transmission using two adjacent 20MHz frequency ranges, each of which has a center frequency up-converted from a baseband signal. EX-1003, ¶¶ 421-424, 428 and 432-437. *See also* Pet., pp. 57-62. Shearer also discloses two separate up-conversions applied to each respective one of the two adjacent 20 MHz frequency ranges as Dr. Negus described in detail (via Shearer's disclosure of multiplying the baseband signal by $e^{j2\pi f_{shift} t}$ where f_{shift} is respectively -10 MHz or +10 MHz). EX-1003, ¶¶ 422-428. Given the similarity between IEEE 802.11n D2.0 and Shearer, and the overlap of PO’s arguments for both grounds, Petitioner’s other arguments apply equally to Shearer.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify, pursuant to 37 C.F.R. Section 42.6, that a complete copy of the attached Petitioner's Reply to Patent Owner's Preliminary Response is being served via Electronic Mail on July 25, 2024, in the United States Patent and Trademark Office/Patent Trial and Appeal Board, and upon the Patent Owner, pursuant to the Patent Owner's Mandatory Notices, by serving its designated lead and back-up counsel for these proceedings as follows:

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