

NOTE: This disposition is nonprecedential.

**United States Court of Appeals
for the Federal Circuit**

IN RE ALI S. KHAYRALLAH

2014-1382

Appeal from the United States Patent and Trademark Office, Patent Trial and Appeal Board in Serial No. 11/517,533.

Decided: December 9, 2014

DAVID E. BENNETT, Coats & Bennett, P.L.L.C. of Cary, North Carolina, for appellant. With him on the brief was LETAO QIN.

NATHAN K. KELLEY, Solicitor, United States Patent and Trademark Office, of Alexandria, Virginia, for appellee. With him on the brief were THOMAS W. KRAUSE, Deputy Solicitor, MICHAEL S. FORMAN and STACY B. MARGOLIES, Associate Solicitors.

Before DYK, WALLACH, and HUGHES, *Circuit Judges*.

DYK, *Circuit Judge*.

Ali S. Khayrallah (“Khayrallah”) appeals from a decision by the United States Patent and Trademark Office, Patent Trial and Appeal Board (“Board”). The Board rejected his claims as anticipated and obvious under 35 U.S.C. § 102(b) and § 103(a). We affirm.

BACKGROUND

On September 7, 2006, Khayrallah filed an application for a patent, U.S. Patent Application No. 11/517,533, entitled “Method of Receiving Wideband Signal.” On June 3, 2010, the examiner issued a non-final rejection of all pending claims, relying on various combinations of four prior art references: U.S. Patent No. 6,574,459 and U.S. Patent Publication Nos. 2005/0078649, 2005/0141412, and 2006/0111054. Khayrallah appealed to the Board, which affirmed the examiner’s rejection of all pending claims on December 23, 2013, as anticipated or obvious. The Board found that independent claims 1 and 20 were anticipated in light of one prior art reference: U.S. Patent Publication No. 2005/0078649 (“Tehrani”). The various dependent claims were anticipated or obvious in light of Tehrani and additional references not at issue here.

Khayrallah appealed and challenges whether independent claim 1 is anticipated in light of Tehrani. Khayrallah also appeals whether independent claim 20 and dependent claims 2–11, 16–19, 21–30, and 35–39 are patentable over Tehrani, arguing simply that they are patentable for the same reasons claim 1 is patentable.

The claimed invention relates to variable bandwidth receivers having multiple antennas, in which different antennas are configured to receive sub-signals of a wideband signal. Claim 1 is representative:

A method for receiving a wideband signal including multiple sub-signals, said method comprising:

receiving the wideband signal using two or more receive antennas;

selectively assigning a first one of said receive antennas to receive *one or more signals of interest on* a first sub-signal of the wideband signal;

selectively assigning a second one of said receive antennas to receive *one or more signals of interest on* a second sub-signal of the wideband signal;
and

wherein said first and second sub-signals have different bandwidths and overlap in the frequency domain.

J.A. 3 (emphases added). As originally filed, the claim did not contain the emphasized portions; the emphasized portions were added during prosecution in response to rejections by the examiner.

We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(4)(A).

DISCUSSION

This appeal raises two related issues: first, did the Board give the proper broadest reasonable interpretation to claim 1; second, in light of the proper interpretation, does Tehrani anticipate the claim? We review the first question de novo. *In re Montgomery*, 677 F.3d 1375, 1379 (Fed. Cir. 2012) (“The broadest reasonable interpretation, like claim construction in the infringement context, is a question of law that we review de novo.”) (citing *In re NTP, Inc.*, 654 F.3d 1268, 1274 (Fed. Cir. 2011)). We review the second question for substantial evidence. *In re Suitco Surface, Inc.*, 603 F.3d 1255, 1259 (Fed. Cir. 2010).

Khayrallah argues that the Board opinion does not take proper account of the “to receive” language and the “wherein” clause found in claim 1.

While there is language in the Board opinion suggesting the “to receive” language and the “wherein” clause were not limiting, the Board’s ultimate interpretation incorporated those limiting requirements. The Board interpreted “selectively assigning a first one of said receive antennas *to receive* one or more signals of interest on a first sub-signal of the wideband signal” as requiring “merely assigning a first antenna that is *capable of* receiving a signal at a first discrete frequency component of the wideband signal.” J.A. 8 (emphasis in original). The Board interpreted the two “selectively assigning” steps, taken together, as “assigning a first and second antenna that are capable of receiving a first and second sub-signal which have different bandwidths and overlap in the frequency domain.” J.A. 8–9. Thus, the limitation found in the “wherein” clause—that the signals “have different bandwidths and overlap in frequency domain”—was incorporated into the Board’s express requirement that the two antennas be “capable of receiving a first and second sub-signal which have *different bandwidths and overlap in the frequency domain.*” *Id.* (emphasis added). Similarly, the “to receive” limitation was incorporated into the interpretation when the Board required that the antennas be “capable of receiving” a signal at a discrete frequency. In light of the specification, which expressly discloses separate antennas each receiving the entire wideband signal, these interpretations were consistent with the broadest reasonable interpretation of the terms.

In light of the broadest reasonable interpretation of claim 1, there is substantial evidence to conclude that Tehrani teaches the claimed invention. Tehrani discloses a multi-antenna receiver in which each receiver receives a

different version of the same signal. That redundancy can minimize errors in propagation. The examiner found, and the Board agreed, that, because each antenna's physical location will affect the signal it receives, the antennas will "selectively" receive the signal because, "changing the position of the antenna in space will result in a different version of the signal being received." J.A. 208. Additionally, the examiner found, and the Board agreed, that the requirements of different bandwidths and overlap in frequency were inherently disclosed in Tehrani. As support, the examiner reasoned that the signals in Tehrani must overlap in frequency because they are different versions of the same wideband signal. He reasoned that the signals received by the different antennas would inherently vary slightly because of natural changes in phase, power, and interference—that is, the received signals would differ from each other as a result of natural impairment during propagation. For the reasons provided by the examiner and the Board, we find that there is substantial evidence that Tehrani anticipates claim 1 of Khayrallah's application.

Khayrallah argues that Tehrani does not disclose receiving different sub-signals because no reasonable interpretation of sub-signals can include the signals received by Tehrani. We disagree. In Tehrani, the same signal is sent to two separate antennas. As noted above, when received by the antennas, the versions of the signals differed from each other due to natural impairment during propagation. Treating these differently impaired signals as sub-signals is consistent with the broadest reasonable interpretation of the term 'sub-signals' as used by Khayrallah. The specification nowhere expressly defines 'sub-signal,' and Khayrallah has failed to explain how the broadest reasonable interpretation of that term cannot include the wideband signal impaired during

propagation. When the specification does describe sub-signals, it uses broad, inclusive language. For example, the specification states:

The sub-signals of the wideband signal occupy different portions of the frequency spectrum of the wideband signal. The sub-signals may be spaced apart in the frequency domain, or may overlap. The frequency bands of the sub-signals may be adjacent or non-adjacent. . . . The sub-signals of the wideband signal may occupy different sub-channels of a wideband channel. The sub-channels may have different bandwidths and may overlap in frequency.

J.A. 26–27. Given such broad descriptions of sub-signal, the recognition of possible “overlap,” and the lack of an express definition, Khayrallah cannot complain that the Board’s broadest reasonable interpretation includes two versions of a signal differently impaired during propagation.

Because we do not find any error in the Board’s decision that claim 1 is anticipated, and because Khayrallah puts forth no independent defense of any of the additional claims, we find no error in the Board’s conclusion that independent claim 20 and dependent claims 2–11, 16–19, 21–30, and 35–39 would have been obvious.

AFFIRMED