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EXAMINER
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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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Ex parte OLAV TIRKKONEN, MIKA P. RINNE,
and KLAUS HUGL

_____

Appeal 2019-001051
Application 11/544,498
Technology Center 2600

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Before JOHN A. JEFFERY, JOHN A. EVANS, and
MONICA S. ULLAGADDI, *Administrative Patent Judges*.

ULLAGADDI, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant[1] appeals under 35 U.S.C. § 134 from a final rejection of claims 1, 2, 5–8, 12, 15–17, 19–22, 25–27, 29, 30, and 34–55. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm-in-part.

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[1] We use the word "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42. Appellant identifies Nokia Technologies Oy as the real party in interest. Appeal Br. 5.

STATEMENT OF THE CASE

The claims are directed to a common pilot channel for soft frequency reuse. Abstract. Claim 1 is illustrative of the claimed subject matter:

1. A method comprising:

allocating, by an apparatus, a first plurality of pilot resources to a first frequency sub-band comprising a plurality of first sub-carriers allocated to users on higher power sub-bands;

allocating, by the apparatus, a second plurality of pilot resources to a second frequency sub-band comprising a plurality of second sub-carriers allocated to users on lower power sub-bands;

generating, by the apparatus, a first signal comprising a first pilot-data power offset between said first plurality of pilot resources and said plurality of first sub-carriers allocated to users on higher power sub-bands, wherein the first pilot-data power offset is a differing power of pilot transmission on said first plurality of pilot resources and data transmission on said plurality of first sub-carriers;

generating, by the apparatus, a second signal comprising a second pilot-data power offset between said second plurality of pilot resources and said plurality of second subcarriers allocated to users on lower power sub-bands, wherein the second pilot-data power offset is a differing power of pilot transmission on said second plurality of pilot resources and data transmission on said plurality of second sub-carriers; and

wirelessly transmitting said first and/or second signals;

where a pilot resource pattern common to the users on the higher power sub-bands and the users on the lower power sub-bands remains unchanged.

REFERENCES

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Name	Reference	Date
Rinne	US 6,259,685 B1	July 10, 2001
Lee	US 2003/0128673 A1	July 10, 2003
Nyström	EP 1 542 488 A1	June 15, 2005
Love	US 7,457,588 B2	Nov. 25, 2008, filed Aug. 1, 2005
Böhnke	US 6,545,997 B1	April 8, 2003

REJECTIONS

Claims 1, 2, 6–8, 12, 16, 17, 19, 21, 22, 26, 27, 30, 34, 36–47, 49–52, 54, and 55 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Nyström, Rinne, and Lee. Final Act. 8–18.

Claims 15, 20, 25, and 35 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Nyström, Rinne, Lee, and Love. Final Act. 18.

Claims 5, 29, 48,[2] and 53 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Nyström, Rinne, Lee, and Böhnke. Final Act. 19–21.

ANALYSIS

i.

The first issue before us is whether the Examiner erred in finding that the combination of Nyström, Rinne, and Lee teaches or suggests the limitations of claim 1 and commensurate limitations of claims 16, 21, 26, 36–38, 45, and 50, and specifically, whether Nyström teaches or suggests a "first pilot-data power offset" and a "second pilot-data power offset" as claimed.

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[2] Although the Office Action Summary of the Final Office Action and the Advisory Action indicate claim 48 is rejected, neither treats this claim substantively. The Examiner's Answer addresses claim 48, and treats this claim as it does claims 5, 29, and 53. Ans. 29–32.

In the Final Office Action, the Examiner cites the abstract, paragraphs 25 and 43, and Figures 5 and 6 of Nyström as teaching the "first pilot-data power offset" and a "second pilot-data power offset" limitations. Final Act. 8–9. In the *Response to Arguments* portion of the Final Office Action, the Examiner finds that

> Nystrom teaches "the power offset" claimed in the claim 1. The Office submits that Nystrom teaches the pilot power can be varied based on the different classes of users and are signaled to the receiver. Further Nystrom only disclose[s] varying pilot power that is there is an offset between the pilot power and data. Further Nystrom disclose "The pilot symbols can also be transmitted with different power for different classes of users and depending on path loss" (see paragraph 0043). That is transmitting pilot symbols with different power level. *Nystrom does not disclose that the data is transmitted with different power, only the pilot is transmitted with different power (see paragraph 0043).* The Office further submits that Nystrom teaches pilot subcarrier 102 and data subcarrier 10[4] (see figure 2). The Office further submits that Rinne et al teach having higher power subcarriers and lower power subcarriers (see figure 11). Therefore it would have been obvious to an ordinary skilled in the art at the time the invention was made to have higher power sub-bands and lower power sub-bands.

Id. at 5 (emphasis added); *see* Adv. Act. 4–5. In the Examiner's Answer, the Examiner explains that claim 1 does not recite "comparing the pilot power to data power," but instead recites "generating signal comprising offset between pilot power and the data power." Ans. 4. The Examiner further explains that

> Nystrom teach[es] transmitting the pilot signals with differing power (see paragraph 0043). *Nystrom further teaches only the pilot powers are being varied and no change in data power (see paragraph 0043)* and further disclose that if the power is dynamically varying, the power levels have to be signaled to the

receiver (see Nystrom, paragraph 0043). Signaling the power levels *(data signal power and pilot signal power)* clearly indicate that the power offset between the data and the pilot.

Id. (emphases added).

Appellant argues "Nyström discusses differing pilot patterns and different power levels, which are not analogous to the pilot-data power offsets as currently claimed nor do they teach or suggest them." Appeal Br. 40 (emphasis omitted). According to Appellant, "Nyström's differing pilot symbols do not even hint at comparing power between the pilot and the data; thus, they do not even approximate a pilot-data power offset." *Id.* (emphasis omitted).

The cited portions of Nyström disclose "determin[ing] a number of different pilot patterns and assign[ing] these pilot patterns to different parts of the entire radio resource space," such that "different parts of the radio resource space have a denser or at least differing pilot pattern than other parts," in which "[e]ach pilot pattern is intended to accommodate users experiencing different channel characteristics." Nyström ¶ 25. Nyström further discloses "[t]he pilot symbols can also be transmitted with different power for different classes of users and depending on path loss," which can "dynamically vary[] between zero and a given number P_{max} or be defined in advance." *Id.* ¶ 43. According to Nyström, "a power level equal to zero is equivalent to no pilots for this slot, enabling the use of this slot for other purposes, such as data." *Id.* "If the power is dynamically varying, the power levels have to be signalled to the receiver for appropriate treatment." *Id.*

Contrary to the Examiner's findings, we are not persuaded that the above-quoted portions of Nyström teach or suggest a power level for

transmitting data, and instead, find that Nyström only mentions transmitting data as alternative when *no pilots are present in a slot. Id.* Merely because "Nyström does not disclose that the data is transmitted with different power" (*see* Final Act. 5), does not imply Nyström teaches that "*only* the pilot powers are being varied and *no change in data power*" (*see* Ans. 4 (citing Nyström ¶ 43) (emphases added)), as the Examiner finds. The Examiner does not find that the ordinarily skilled artisan would have understood paragraph 43 of Nyström to teach or suggest transmitting data in the pilot's slot *at zero power*. It is not clear from the Examiner's findings that the ordinarily skilled artisan would have understood paragraph 43 of Nyström to teach or suggest signaling data signal power along with pilot signal power. Assuming, *arguendo*, the power associated with transmitting data does not change as the Examiner finds, it is not clear why this unchanging data power level would need to be signaled to the receiver, as the Examiner states. *See* Ans. 4 (explaining "no change in data power" and "[s]ignaling the power levels (data signal power and pilot signal power) clearly indicate that the power offset between the data and the pilot").

The cited portions of Nyström do not teach or suggest the power level(s) used to transmit data, nor whether it would be necessary to transmit such power level(s) to the receiver. The Examiner does not indicate how the ordinarily skilled artisan would have understood the cited portions of Nyström, and in particular, whether the skilled artisan would have understood the cited portions to teach or suggest anything about the specifics of transmitting data, at least not in a manner that is supported by sufficient evidence.

For the foregoing reasons, we are not persuaded Nyström teaches or suggests "a first signal comprising a first pilot-data power offset . . . wherein the first pilot-data power offset is a differing power of pilot transmission on said first plurality of pilot resources and data transmission on said plurality of first sub-carriers," as recited in claim 1. Neither are we persuaded that Nyström teaches or suggests

> a second signal comprising a second pilot-data power offset between said second plurality of pilot resources and said plurality of second subcarriers allocated to users on lower power sub-bands, wherein the second pilot-data power offset is a differing power of pilot transmission on said second plurality of pilot resources and data transmission on said plurality of second sub-carriers,

as recited in claim 1.

Accordingly, we are persuaded that the Examiner erred in rejecting independent claim 1. As independent claims 16, 21, 26, 36–38, 45, and 50 recite commensurate limitations, we are persuaded that the Examiner erred in rejecting these claims, as well as dependent claims 2, 6–8, 12, 17, 19, 22, 27, 30, 34, 39–44, 46, 47, 49, 51, 52, 54, and 55, which depend from these independent claims and which are also rejected over the combination of Nyström, Rinne, and Lee. Dependent claims 15, 20, 25, and 35 were rejected over the combination of Nyström, Rinne, Lee, and Love and dependent claims 29, 48, and 53 were rejected over the combination of Nyström, Rinne, Lee, and Böhnke. Neither Love nor Böhnke cure the deficiencies of the combination of Nyström, Rinne, and Lee discussed above and as such, the Examiner erred in rejecting these dependent claims as well.[3]

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[3] We note that the Examiner cites Wikipedia as supporting evidence for certain findings—we discourage this practice. *See Ex parte Three-*

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<center>*ii.*</center>

The second issue before us is whether the Examiner erred in finding the combination of Nyström, Rinne, Lee, Böhnke teaches or suggests the limitations of independent claim 5, and specifically, whether Böhnke teaches or suggests "wherein a pilot density of said first and said second plurality of pilot resources across said first and said second frequency sub-bands is between approximately 1/2 and 1/10," as claimed.

In our Decision deciding earlier, in Appeal No. 2013-008308 with respect to the present application ("Prior Dec."), we found that this limitation was not taught or suggested by the combination of Nyström, Rinne, and Lee as it was then recited in its claimed combination. Prior Dec. 8–9. The Examiner subsequently added Böhnke to teach this limitation. The Examiner finds

> Nystrom et al is silent on having the pilot density between 1/2 and 1/10. However Nystrom et al teach having a variable pilot density (see figure 5 and 6). At the time the invention was made, it would be obvious to an ordinary skilled in the art to use a pilot density between 1/2 and 1/10 in Nystrom's system. Applicant has not disclosed that pilot density between 1 /2 and 1/10 provides an advantage, is used for a particular purpose, or solves a stated problem. Further Bohnke et al teach a pilot density being between 1/2 and 1/10 (see column 14, lines 7 - 21). Therefore it would be obvious to an ordinary skilled in the art to modify Nystrom in view of Rinne and Lee to obtain the inventions as

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Dimensional Media Group, Ltd., No. 2009-004087, 2010 WL 3017280 (BPAI 2010) (non-precedential), at *17 ("Wikipedia is generally not to be considered as trustworthy as traditional sources for several reasons, for example because (1) it is not peer reviewed; (2) the authors are unknown; and (3) apparently anyone can contribute to the source definition"); *Bing Shun Li v. Holder*, 2010 WL 4368469 (5th Cir. 2010) (unpublished), at *2 (noting Wikipedia's unreliability and citing *Badasa v. Mukasey*, 540 F.3d 909, 910-11 (8th Cir. 2008)).

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specified in claims 5. The motivation or suggestion to do so is to adapt the pilot density to channel conditions.

Final Act. 20.   The Examiner further finds

Bohnke et al teach a pilot density being between 1/2 and 1/10 (see column 14, lines 7-21). Bohnke et al further teach having a pilot at every 5th subcarrier or every 8th subcarrier ((see column 14, lines 7-21). That is hav[ing] pilot density [] of 1 /6 or 1 /8 which [is] between 1/2 and 1/10. Therefore it would be obvious to an ordinary skilled in the art to modify Nystrom in view of Rinne and Lee to obtain the inventions as specified in claims 5. The motivation or suggestion to do so is to adapt the pilot density to channel conditions.

Ans. 30.

Appellant contends that

[W]hile Bohnke discusses pilot symbol density of 1/6 and 1/8, it does not teach or suggest a pilot density of said first and said second plurality of pilot resources across said first and said second frequency sub-bands is between approximately 1/2 and 1/10 where the pilot resource pattern common to the users on the higher power sub-bands and the users on the lower power sub-bands remains unchanged because Bohnke is only concerned with its very specific condition of how the signals are modulated.

Appeal Br. 86.

The cited portion of Böhnke discloses that "a pilot symbol 100' is allocated to every 6th subcarrier 1" and "a pilot symbol 103, 103' is allocated to every 8th subcarrier 1," thus teaching a pilot symbol density of 1/6 and 1/8, respectively. Böhnke, col. 14, ll. 7–21. We are not persuaded by Appellant's contention because Böhnke is not relied upon for teaching "the pilot resource pattern common to the users on the higher power sub-bands and the users on the lower power sub-bands remains unchanged," it is only relied upon for its teaching of the claimed pilot symbol density. Final Act.

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19–20 (citing Rinne and Lee for teaching the limitation of "pilot resource pattern common to users . . . remains unchanged"). Having reviewed the cited portion of Böhnke, we are persuaded that Böhnke's disclosure of pilot symbol densities of 1/6 and 1/8 teaches or suggests "a pilot density . . . is between approximately 1/2 and 1/10," as recited in independent claim 5.

For the foregoing reasons, we are not persuaded that the Examiner erred in rejecting independent claim 5 over the combination of Nyström, Rinne, Lee, and Böhnke.

DECISION SUMMARY

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1, 2, 6–8, 12, 16, 17, 19, 21, 22, 26, 27, 30, 34, 36–47, 49–52, 54, 55	103	Nyström, Rinne, Lee		1, 2, 6–8, 12, 16, 17, 19, 21, 22, 26, 27, 30, 34, 36–47, 49–52, 54, 55
15, 20, 25, 35	103	Nyström, Rinne, Lee, Love		15, 20, 25, 35
5, 29, 48, 53	103	Nyström, Rinne, Lee, Böhnke	5	29, 48, 53
Overall Outcome			5	1, 2, 6–8, 12, 15–17, 19–22, 25–27, 29, 30, 34–55

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv). See 37 C.F.R. § 41.50(f).

AFFIRMED-IN-PART