

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 25

UNITED STATES PATENT AND TRADEMARK OFFICE

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Ex parte SARA MAZUR, BO HAGERMAN, ULF FORSSEN,
SOREN ANDERSSON and FREDRIK OVESJO

Appeal No. 2002-2291
Application No. 09/196,117

HEARD: April 15, 2003

Before KRASS, RUGGIERO, and SAADAT, Administrative Patent Judges.

KRASS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1-11, 13-22 and 24-29.¹

Claim 10 stands allowed by the examiner.

¹We note that the examiner indicates no status for claims 12 and 23 in the statement of the rejection. Then, somewhat inconsistently, the examiner explains the rejection of claims 1, 4, 6, 7, 9, 11, 15-18, 21-24 and 28, at page 3 of the answer, in toto, as “Reudink discloses a receiver system, (a CDMA receiver (102), see fig. 1),” now including at least claim 23 in the rejection but not including claims 2, 3, 5, 8, 12-14, 19, 20 and 25-27. The examiner does provide explanation, at pages 4-5 of the answer, for the rejection of claims 2, 3, 5, 8, 11, 13, 14, 19, 20, 23, 25, 26 and 29 but never mentions claims 12 and 27 so it is difficult to tell whether these claims are subject to rejection or not. Since claim 12 is neither mentioned in the statement of rejection nor in the rationale for the rejection, we treat this claim as not being subject to rejection.

The invention is directed to estimating the direction of arrival (DOA) in an antenna diversity system. It is alleged that in order to estimate the DOA of a signal, signals received by each antenna beam must be received separately by corresponding radio receiver branches and that there are no known systems which can employ antenna diversity and provide an accurate estimation of DOA. Giving the example of the primary applied reference to Reudink, it is said that Reudink discloses a system which employs angular diversity in which branches from each antenna beam are distributed in two groups and that the two groups of signals are delayed in relation to each other and then combined. It is alleged that such combining of these signals loses the angular information and, therefore, DOA estimation is impossible.

According to the instant invention, by introducing an artificial time delay into antenna elements with respect to other antenna elements covering a corresponding space area prior to combining the signals, this allows for DOA estimation while being able to take advantage of the benefits of antenna diversity.

Representative independent claim 1 is reproduced as follows:

1. A receiver system comprising,
at least two antenna assemblies each providing a set of antenna beams and for each beam in a first of said sets of antenna beams there is a corresponding beam in the second of said sets of antenna beams covering a corresponding space area,
delay elements connected to outputs of at least one of said antenna assemblies;
combiner devices, each with inputs connected, either directly or via said delay elements, to outputs of said antenna assemblies, said combiner devices each combining received signals derived from corresponding beams; and

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radio receiver branches each connected to an output of a corresponding combiner device and leading to a radio receiver.

The examiner relies on the following references:

Reudink	5,563,610	Oct. 8, 1996
Newman et al. [Newman]	5,684,491	Nov. 4, 1997

Claims 1-9, 11 and 13-29 stand rejected under 35 U.S.C. 103 as unpatentable over Reudink and Newman.

Reference is made to the briefs and answer for the respective positions of appellants and the examiner.

OPINION

The examiner's position is that Reudink discloses the claimed subject matter except for at least two antenna assemblies each providing a set of antenna beams and for each beam in a first of said set of antenna beams there is a corresponding beam in the second of said sets of antenna beams covering a corresponding space area. The examiner turns to Newman for a disclosure of "at least two antenna assemblies each providing a set of antenna beams (4-beam antennas 20 and 20a), and for each beam in a first of said set of antenna beams (21', 22', 23' and 24') there is a corresponding beam in the second of said sets of antenna beams (21a', 22a', 23a' and 24a') covering a corresponding space area, see fig. 1." The examiner concludes from these teachings that it would have been obvious "to modify Reudink in having two antenna beams and the

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antenna beams covering corresponding space areas, as disclosed by Newman, in order to achieve the higher gain receive antennas and permit reliable reception of user signals at greater distances and higher gain is also possible by use of narrow beam width antennas providing coverage of only a portion of a sector” [answer-pages 3-4].

In rejecting claims under 35 U.S.C. 103, it is incumbent upon the examiner to establish a factual basis to support the legal conclusion of obviousness. See In re Fine, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the examiner is expected to make the factual determinations set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), and to provide a reason why one having ordinary skill in the pertinent art would have been led to modify the prior art or to combine prior art references to arrive at the claimed invention. Such reason must stem from some teachings, suggestions or implications in the prior art as a whole or knowledge generally available to one having ordinary skill in the art. Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir.), cert. denied, 488 U.S. 825 (1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017 (1986); ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). These showings by the examiner are an essential part of complying with the burden of presenting a prima facie case of obviousness. Note In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). If that burden is met, the burden then shifts to the applicant to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the

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basis of the evidence as a whole and the relative persuasiveness of the arguments. See Id.; In re Hedges, 783 F.2d 1038, 1039, 228 USPQ 685, 686 (Fed. Cir. 1986); In re Piasecki, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984); and In re Rinehart, 531 F.2d 1048, 1052, 189 USPQ 143, 147 (CCPA 1976).

We will not sustain the examiner's rejection of the claims because, in our view, the examiner has failed to establish a prima facie case of obviousness. Even if everything the examiner says about the references is true, the examiner has merely cited one reference for some of the claimed subject matter, the second reference for the remainder of the claimed subject matter and concluded, in essence, that since both references, together, show all of the claimed subject matter, it would have been obvious to combine them. There needs to be some reason, established by the prior art or common knowledge of artisans, for modifying the references in order to arrive at the claimed subject matter. The examiner states this reason to be "in order to achieve the higher gain receive antennas and permit reliable reception of user signals at greater distances and higher gain is also possible by use of narrow beam width antennas providing coverage of only a portion of a sector."

We are unpersuaded. The examiner does not indicate where the prior art suggests that these advantages of "higher gain" and "reliable reception...at greater distances" would be achieved by combining Reudink and Newman.

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Moreover, we agree with appellants that the portion of Reudink, at column 6, lines 45-50, would appear to suggest against the instant claimed subject matter. That portion reads:

With the present invention, substantial spacing is not required to maintain signal separation. Each beam (from either a multiple-beam antenna or a plurality of discrete antennas) has a different angular coverage (i.e. each beam has a different view). Thus, angular rather than spacial diversity is achieved.

Thus, Reudink appears to suggest that it would be desirable to employ angular diversity instead of spacial diversity.

Furthermore, as pointed out by appellants, at page 7 of the principal brief, the portion of Newman on which the examiner relies relates to a spacial diversity system in which the antennas are separated by several wavelengths, which appears to be the opposite of that which is being suggested by Reudink. Accordingly, the artisans viewing these two references together would never have sought to combine them in the manner suggested by the examiner because the teachings are at odds with each other.

The examiner's response is to contend that the references should be combined because they "are in the same field of endeavor" [answer-page 6]. While it is important that references to be combined, in accordance with 35 U.S.C. 103, must be directed to analogous arts, meaning that they should be within the same field of endeavor or, if not, then at least pertinent to the problem with which the inventor was faced, the fact that the references are in the same field of endeavor as the claimed subject matter is not sufficient, per se, to provide a sufficient motivation for combining them. There must be something more to suggest the combination.

The examiner suggests, at page 7 and, again, at page 9, of the answer, that Reudink, alone, would be enough to reject the instant claims. In essence, the examiner is suggesting that Reudink constitutes an anticipatory reference against the instant claims. However, the examiner never satisfactorily explains how or why this is so, referring merely to Reudink's antenna assemblies "branches 103 and 104" as each providing a set of antenna beams and for each beam in a first of said set of antenna beams there is a corresponding space area, with antenna 401c encompassing the entire field of view of antenna 401 and antennas 401a, 401b, 401d and 401e covering a 120 degree sector and antenna 401c similarly covering 120 degrees. See page 7 of the answer, where the examiner references column 7, lines 55-68, and Figure 4 of Reudink.

Not only does the examiner appear to be changing the final rejection at this late point in the prosecution, from a rejection under 35 U.S.C. 103 over a combination of two references to a rejection under 35 U.S.C. 102 as anticipated by a single reference, but the examiner's reliance on Reudink appears to be misplaced. As pointed out by appellants in the reply brief, the examiner's reliance on a combination Figures 1 and 4 of Reudink is not well taken since these figures refer to "alternate" embodiments. There is no suggestion within the disclosure of Reudink to combine these embodiments. While Figure 1 is directed to multi-beam antennas, Reudink refers to Figure 4 to show that the invention is not limited thereto and can be applied to multiple discrete antennas. However, the Figure 4 embodiment, disclosing multiple discrete antennas, does not provide a "set of antenna beams," as required by the instant claims.

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We do note that after discussing the Figure 1 embodiment having a single antenna assembly 101, Reudink does state, at column 5, lines 2-3, that in an alternate embodiment, “any number of multiple beam antennas known in the art can be used.” Accordingly, Reudink does appear to disclose “at least two antenna assemblies each providing a set of antenna beams...” On the other hand, this cited portion may only mean that any one of many known multiple beam antennas may be used. In any event, it may very well be that a case for anticipation of the instant claimed subject matter might be made, based on Reudink, alone, but, the fact is, the examiner has not made it since the examiner has not identified how each of the claimed elements corresponds to something in Reudink. Moreover, the examiner has not made any rejection of the instant claims under 35 U.S.C. 102 and no such rejection is before us.

The rejection before us is a combination of Reudink and Newman and the examiner’s rationale, as well as the response to appellants’ arguments, argues bits and pieces of the references without a clear and cogent rationale as to how or why the artisan would have been led, in any way, to combine the teachings of Reudink and Newman to arrive at the subject matter set forth in independent claims 1, 18 and 24.

Accordingly, since the examiner has failed to establish a prima facie case of obviousness of the instant claimed subject matter by presenting a clear and cogent rationale that would have led the skilled artisan to modify Reudink, in any manner, by some teaching of Newman, so as to

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result in the subject matter of independent claims 1, 18 and 24, we will not sustain the rejection of claims 1, 18 and 24 under 35 U.S.C. 103. It follows that we also will not sustain the rejection of the claims depending from these independent claims.

Thus, the examiner's rejection of claims 1-9, 11 and 13-29 under 35 U.S.C. 103 as unpatentable over Reudink and Newman is reversed.

The examiner's decision is reversed.

REVERSED

Errol A. Krass)
Administrative Patent Judge)
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) BOARD OF PATENT
Joseph F. Ruggiero)
Administrative Patent Judge) APPEALS AND
)
) INTERFERENCES
)
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