UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MARTIN KAPPES,
ANJUR S. KRISHNAKUMAR,
and P. KRISHNAN

Appeal 2008-1224
Application 10/834,291
Technology Center 2600

Decided: October 29, 2008

Before JOSEPH F. RUGGIERO, ROBERT E. NAPPI
and KARL D. EASTHOM, *Administrative Patent Judges*.

EASTHOM, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134 from the Final Rejection of claims 1-20, the only claims pending (*see* Reply Br. 1).[1] We have jurisdiction under 35 U.S.C. § 6(b).

We affirm-in-part.

Appellants' invention relates to generating a signal strength model at a wireless network site for any desired/random access point 350 (Spec. Fig. 3) without taking actual signal strength measurements at the desired access point. For example, signal strength measurements of signals emanating from real access points 310-1, 310-2, . . . 310-7 are used to build a signal strength model for the desired access point 350 (*see* Spec. Fig. 3). Since the model is built using actual sampling of signal strengths, it also automatically takes into account building characteristics of the site. (Spec. 5-8).

Claim 1 is illustrative of the invention and reads as follows:

1. A method for obtaining a signal strength model for an access point at an arbitrary location, *q*, at a site, comprising:

obtaining signal strength measurements for each of *n* sampling points;

computing the signal strength received at said arbitrary location, q, from each of said sampling points without requiring said signal strength measurements for said arbitrary location, q;

[1] While Appellants state that only claims 1, 2, 4, 59, 10, 12, 13, 16, and 17 are being appealed (App Br. 2), Appellants also indicate that claims 1-20 are being appealed in two separate places (*see* Reply Br. 1 - "an Appeal of the final rejection of claims 1-20"; Reply Br. 2 – "[a] copy of the appealed claims is contained in the Appendix of Appellants' Appeal Brief" – the Appendix lists claims 1-20). The Reply Brief supersedes the Appeal Brief.

obtaining signal strength estimates corresponding to the signal received at said sampling points from said arbitrary location; and

determining a signal strength model for an access point positioned at said arbitrary location, *q*, wherein said signal strength model does not require knowledge of a physical layout of said arbitrary location.

The Examiner relies on the following prior art reference to show unpatentability:

Gray	US 6,674,403 B2	Jan. 6, 2004

Claims 1, 6-9, 14-16, 19 and 20 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Gray.

Claims 2-5, 10-13, 17 and 18 stand rejected under 35 U.S.C. § 103 as being obvious over the collective teachings of Clark and Appellants' admitted prior art (*hereinafter* "APA").

Rather than reiterate the arguments of Appellants and the Examiner, reference is made to the Brief and Answer for the respective details. Only those arguments actually made by Appellants have been considered in this decision. Arguments which Appellants could have made but chose not to make in the Briefs have not been considered and are deemed to be waived. 37 C.F.R. § 41.37(c) (1) (vii).

FINDINGS OF FACT (FF)

1. Gray discloses creating signal strength models within building sites using a digital site map (col. 3, ll. 42-46). The digital map includes a definition of obstructions, such as brick walls, which electromagnetically interfere less than other obstructions, such as windows. (Gray, col. 11, ll.

58-63). "Obstructions may be assigned values relating to the amount of interference they tend to provide." (Gray, col. 11, ll. 60-61).

2. "The digital form or map of the physical space preferably includes the identification of permanent obstructions that will effect the transmission and reception capabilities of the access points, e.g., walls, columns, and so on." (Gray, col. 3, ll. 45-49).

3. Gray discloses, in a "first manner," taking a survey of data from actual transmitting/receiving access points 110 with a mobile device 120. (Gray, col. 8, ll. 37-48). "The actual signal strength data received from the access points 110 are used to build a statistical signal strength model associated with the digital map 200 of the physical space." (Gray, col. 8, ll. 48-51). Using such data collected from the survey, the model developer can place an access point anywhere in the site, and develop a model based on the data – using "a few different manners," including automated or manual approaches. (Col. 9, ll. 1-14).

4. In a "second manner," building the statistical model involves using simulated access points and simulated mobile device readings within the context of a digital map. The simulation model is generated as a function of assumptions concerning reception and transmission characteristics of the access points and mobile devices. (Col. 4, ll. 17-29, col. 9, ll. 15-23) "Preferably, the system 100 allows for editing the assumptions (including the positioning of obstructions and access points) to yield different statistical models using the user interface of the system." (Col. 9, ll. 23-26).

5. Actual signal strength data obtained in the survey according to the first manner provides a means for correlating predictions within statistical models built according to all of Gray's embodiments, including the first and

second manners (*see* col. 9, ll. 1-4, col. 10, ll. 14-17, 35-46). The data is preferably enhanced by taking a finite set of samples used for "training" each model. (Col. 9, ll. 27-46). The data is used also to calculate an optimal point for an access point using fixed access points (col. 11, ll. 44-48).

6. Gray states:

> Analyzing the interference characteristics in light of a range of signal strengths from a foreseeable set of mobile devices and in light of the detection and transmission characteristics of the access points, allows access point placement to be determined. If there are detectors having different detection and transmission characteristics identified in the system, the system may not only determine placement, but also selection of detectors.

(Col. 4, ll. 38-46).

7. Figure 5 of Gray depicts a diagram of signal strengths from an access point 510. The diagram depicts lines of equal strength such as 90%, 80 %, . . . 25%. Signal strengths between such lines can be estimated to be values numerically between the numbered values of the lines. (*See* Fig. 5, col. 8, ll. 20-27).

PRINCIPLES OF LAW

Appellants have the burden on appeal to the Board to demonstrate error in the Examiner's position. *See In re Kahn,* 441 F.3d 977, 985-86 (Fed. Cir. 2006) ("On appeal to the Board, an applicant can overcome a rejection [under § 103] by showing insufficient evidence *of prima facie* obviousness or by rebutting the *prima facie* case with evidence of secondary indicia of nonobviousness.") (quoting *In re Rouffet,* 149 F.3d 1350, 1355 (Fed. Cir. 1998)).

Under § 102, Appellants may sustain this burden by showing that the prior art reference relied upon by the Examiner fails to disclose an element of the claim. It is axiomatic that anticipation of a claim under § 102 can be found only if the prior art reference discloses every element of the claim. *See In re King*, 801 F.2d 1324, 1326 (Fed. Cir. 1986); *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1458 (Fed. Cir. 1984).

Under § 103, a holding of obviousness can be based on a showing that "there was an apparent reason to combine the known elements in the fashion claimed." *KSR Int'l v. Teleflex, Inc*., 127 S. Ct. 1727, 1740-41 (2007). Such a showing requires:

> "'some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness' . . . [H]owever, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ."

Id., 127 S. Ct. at 1741 (*quoting Kahn*, 441 F.3d at 987).

If the Examiner's makes such a showing, the burden then shifts to the Appellant to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole and the relative persuasiveness of the arguments. *See In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992).

ANALYSIS

Appellants' arguments regarding the anticipatory rejection of claims 1, 6-9, 14-16, 19, and 20 under Gray are directed toward independent claims

1, 9 and 16 without distinction. (App. Br. 4-6). Therefore, we select claim 1 as representative of the group.

Appellants dispute the Examiner's finding (Ans. 3-4) that Gray teaches portions of the second and fourth steps as set forth in the method of claim 1. The second step requires "computing the signal strength received at said arbitrary location, q, from each of said sampling points without requiring said signal strength measurements for said arbitrary location, q." In other words, the second step requires signal strengths for an arbitrary location to be determined without taking measurements at that arbitrary location.

Appellants specifically argue that Gray's first manner (*see* FF 2) requires physical data measurements at arbitrary access points, contrary to the claim requirements (Reply Br. 3). We disagree with Appellants. While Gray's first manner includes data collection at access points, Gray's first manner also creates signal strength data throughout the building site without taking measurements at each spot in the building. (*See* FF 5-7). The data allows a system designer to place an access point anywhere within the site, and the signal strength model is built upon that placement (FF 3).

As another example, in Gray's signal strength map (Fig. 5), we find that spaces between the lines of equal strength or points everywhere on the lines are not measured.[2] (*See* FF 7). In general, Gray's system contemplates placing an access point anywhere in a building site (FF 6), and includes calculating an optimal point (FF 5) – i.e., the system contemplates moving the access site to an optimal (i.e., arbitrary) location without taking a

[2] Gray naturally teaches measuring only a finite set of points to train the model. (FF 5).

measurement there (FF 5). We find that the data obtained under Gray's first manner, and/or data similarly obtained (e.g., to train the model – *compare* Ans. 4), is employed in Gray's system despite which "manner" is used (*see* FF 5).

Additionally, Gray's method employs statistical modeling techniques to represent signal densities (col. 9, ll. 27-65). We infer that such densities are calculated as a means to predict signal strengths without taking actual measurements. Consequently, we are not persuaded that the Examiner erred in determining that Gray's first manner meets the second step of the claim.

We turn to the dispute over the fourth step set forth in the method of claim 1: "determining a signal strength model for an access point positioned at said arbitrary location, *q*, wherein said signal strength model does not require knowledge of a physical layout of said arbitrary location." Appellants specifically contend that Gray's second manner of acquiring data requires knowledge of a physical layout. (App. Br. 4-5). The Examiner found that while Gray's system allows for knowledge of the physical layout, it does not require it (*see* Ans. 4). We agree with the Examiner.

As the Examiner explained, the system allows editing, and such editing implies the ability to remove obstructions and/or reflectors from the model. (Ans. 16). Appellants counter that, by editing, Gray's disclosure merely teaches changing the obstruction data. (Reply Br. 6). We find the Examiner's argument to be more persuasive on this point. We find that even if Appellants are correct, changing the data reasonably implies changing it to include a zero value for the interference associated with an obstruction (i.e., a window), or, at least, moving the obstruction to a position within the site that does not alter the model's predictions. (*See* FF 1, 4). In other words,

we find that Gray's system, in its simplest form, allows a designer to move and model access points within a generic building, under assumptions, for example, involving transmission/reception characteristics and locations of expected transmitters and receivers, but without requiring specific knowledge regarding each obstruction point within the building (*see* FF 4). Our finding is buttressed by Gray's statement that including obstructions in a digital map is merely "preferable." (FF 2). In sum, complete knowledge of a building's physical layout is not required by Gray's model, contrary to Appellants arguments.[3]

Consequently, for the reasons explained above, we are in concurrence with the Examiner's findings and reasoning that Gray meets the disputed steps as set forth in the method of claim 1. Accordingly, we sustain the Examiner's rejection of claim 1. We also sustain the rejection of claims 6-9, 14-16, 19 and 20, which were not separately argued.

On the other hand, we will not sustain the obviousness rejections of claims 2-5, 10-13, 17 and 18 based on the combination of Gray and the APA. Appellants argue that the combination, and, in particular, the prior art (i.e., the APA) cited on pages 4-5 of the Specification, does not teach all the steps involved in independent claims claim 2, 10, and 17 (App. Br. 7). As Appellants generally state (*id*.), exemplary dependent claim 2 recites three additional steps: "smoothing the obtained signal strength measurements into

[3] Appellants do not argue that the claim precludes the digital map itself as constituting knowledge of a physical layout. Rather, Appellants' argument is directed only to the obstructions and/or reflectors in the map. (App. Br. 5-6; Reply Br. 4-5). In any case, we infer that Appellants' system similarly requires rudimentary knowledge of the building site in order to move through it, and thereby, for example, to locate access points and to obtain measurements. (*See* Spec. 5-8).

a set; dividing said site into a grid of squares of known size; and interpolating said set across two dimensions to form a scalar array to estimate said received signal strength at the center of each grid square." Independent claims 10 and 17 recite similar limitations, while claims 3-5, 11-13, and 18 respectively depend from claims 2, 10, and 17.

The Examiner found that the APA collectively teaches all the steps of exemplary claim 2 (Ans. 11-12). In the passage of Appellants' Specification relied upon by the Examiner (i.e., Spec. 4:.25 to Spec. 5: 6), we find, from inferences flowing from each of the titles of the several publications listed there and Appellants' Brief remarks there regarding such publications, that Appellants, at most, recite different prior art publications each of which discloses methods to support one of the three steps of the claim.

However, we do not find in the Examiner's findings an articulated supporting rationale as required under *KSR* and *Kahn supra* for using the prior art methods to perform all three of the steps as recited in the combination. Particularly, while the Examiner identifies which prior art publications teach the smoothing and interpolating steps, the Examiner does not point to a teaching and supporting rationale regarding how the claimed dividing step can be performed and combined with the other teachings (*see* Ans. 11-12). As such, the Examiner has failed to establish a *prima facie* case of obviousness for claims 2, 10 and 17, and claims 3-5, 11-13 and 18 dependent therefrom. *See Oetiker supra.*

CONCLUSION

We conclude that the Examiner erred in rejecting claims 2-5, 10-13, 17, and 18. Accordingly, we will not sustain the Examiner's rejections of

those claims. On the other hand we have sustained the Examiner's rejections of claims 1, 6-9, 14-16, 19, and 20.

DECISION

We reverse the Examiner's decision rejecting claims 2-5, 10-13, 17 and 18. We affirm the Examiner's decision rejecting claims 1, 6-9, 14-16, 19, and 20.

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).

AFFIRMED-IN-PART

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