UNITED STATES DISTRICT COURT
DISTRICT OF MASSACHUSETTS

SKYHOOK WIRELESS, INC.,

                        Plaintiff,

        v.   CIVIL ACTION
                                                    NO. 10-cv-11571-RWZ
GOOGLE INC.,

                        Defendant.

PLAINTIFF GOOGLE INC.'S STATEMENT OF UNDISPUTED MATERIAL FACTS PURSUANT TO LOCAL RULE 56.1

Defendant Google Inc. submits this statement of uncontested facts in support of its

Motion for Summary Judgment on Indefiniteness.

I.   BACKGROUND

1.   Plaintiff Skyhook Wireless Inc. ("Skyhook") is a Delaware corporation, with its

principal place of business in Boston, Massachusetts. Compl. ¶ 4.

2.   Defendant and Counterclaim-Plaintiff Google Inc. ("Google") is a Delaware

Corporation, with its principal place of business in Mountain View, California. Compl. ¶ 5.

3.   Skyhook states that it is the owner of four patents: U.S. Patent Nos. 7,414,988

("the '988 patent"), 7,433,694 ("the '694 patent"), 7,305,245 ("the '245 patent"), and 7,474,897

("the '897 patent") (collectively, "the patents-in-suit"). Compl. ¶¶ 7, 14, 21, 27.

4.   On September 15, 2010, Skyhook filed suit against Google in the United States

District Court District of Massachusetts. Compl.

5.   Skyhook accuses "Google's Location Services" of infringing claims 1-3 in the

'988 patent, claims 1 and 2 in the '694 patent, claims 1, 2, 4-6 and 8 in the '245 patent, and

claims 1-4 in the '897 patent. *See* Plaintiff Skyhook Wireless, Inc.'s Preliminary Infringement

Disclosures (Feb. 14, 2011).

6.   On October 29, 2010, Google answered Skyhook's Complaint, asserting an

affirmative defense of invalidity. Ans. ¶ 33.

II.   PATENTS-IN-SUIT

7.   The patents-in-suit are related. The patents-in-suit each identify the same four

individual inventors (Russel Kipp Jones, Farshid Alizadeh-Shabdiz, Edward James Morgan, and

Michael George Shean). *See* Exs. C-F.[1]

8.   The '988, '694, and '245 patents each claims priority to U.S. Provisional

Application No. 60/623,108, which was filed with the U.S. Patent and Trademark Office on

October 29, 2004. Exs. C-E.

9.   The applications that later issued as the '988, '694 and '245 patents were filed on

October 28, 2005. *Id.*

10.   The '988, '694 and '245 patents each state that they are related to the others, as

well as to the unasserted '762 patent. *See* Ex. C at 1:12-22; Ex. D at 1: 11-32; Ex. E at 1:14-19.

The '897 patent issued from a February 22, 2006 application that claims priority as a

continuation-in-part of the application that issued as the '245 patent. Ex. F.

11.   The '897 patent states that it is related to: U.S. Provisional Application No.

60/654,811 (filed on February 22, 2005); U.S. Provisional Application No. 60/658,481 (filed on

Mar. 4, 2005); the application that issued as the '988 patent (asserted); the application that issued

as the '694 patent (asserted); the application that issued as the '245 patent (asserted); the

application that issued as United States Patent No. 7,403,762 (unasserted); the application that

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[1] Unless stated otherwise, all cited exhibits are attached to the accompanying declaration
of Susan Baker Manning.

issued on February 19, 2009 as the U.S. Patent No. 7,493,127 (unasserted); and pending U.S. Patent App. No. 11/359,154 (filed Feb. 22, 2006). Ex. F at 1:7-41.

12.   The specification of the '988 patent is similar to that of the '694 patent. Exs. C, D. The two patents share the same eleven figures. *Id.* The two detailed descriptions of the inventions are identical, using exactly the same language to describe collection of Wi-Fi access point data using the "Chinese Postman" routing methodology to obtain reference symmetry while avoiding arterial bias. Ex. C at 5:24-14:12 ; Ex. D at 4:44-13:20.

13.   The specification of the '245 patent is similar to that of the '988 and '694 patents. *See* Exs. C-E. However, the summaries of the inventions and discussions of related art differ. *Id.* In other respects they are the same, sharing the same figures and detailed descriptions, including details regarding collection of Wi-Fi access point data using the "Chinese Postman" routing methodology to try to differentiate collection methods acknowledged in the prior art. *See* Ex. C at 8:28-59; Ex. D at 7:47 - 8: 12; Ex. E at 8:24- 54.

14.   The '897 patent contains additional disclosures beyond the '245 patent from which it claims priority, and both the '897 patent and the '245 patent relate to a method of calculating the position of a Wi-Fi enabled user device using a reference database. Exs. E, F, N (comparing the '897 and '245 patents). The '245 and ''897 patents claim slightly different aspects of the process of determining the location of a Wi-Fi enabled device; the '897 patent claims pre-defined rules for including and excluding observed access points from a set used to determine location, Ex. F at 12:21-25, while the '245 patent claims a method of choosing amongst algorithms for location determination, Ex. E at 14:20-24. The specification of the '245 discloses the use of the same "Chinese Postman" routing methodology for collection of access point data disclosed in the '694 and '988 patents, Ex. E at 8:24-54, while the '897 lists arterial

bias and lack of reference symmetry among reference points as drawbacks in the related art, Ex.

F at 2:64-3:5, 3:27-33.

III. PROSECUTION HISTORY

A. Prosecution History of the '988 Patent

15. On November 30, 2007, the Examiner rejected pending claim 1 in the application

for the '988 patent as obvious in light of U.S. Patent App. Pub. No. 2005/0164710 (Beuck) in

view of U.S. Patent App. Pub. No. 2005/0037775 (Moeglein). Ex. G at GSHFED200-12. The

Examiner also objected to claim 1 because the term "radius on the order of tens of miles" "leaves

the claim open ended." *Id*. at GSHFED202. The Examiner also rejected pending claims 2 and 3

as unpatentable in light of the Beuck reference in view of Moeglein and U.S. Patent No.

5,940,825 (Castelli). *Id*. at GSHFED207-10.

16. In response, the applicants amended the last two limitations of claim 1:

> A Wi-Fi location server, comprising:
>
> A database of Wi-Fi access points for at least one target area
> having a radius on the order of tens of miles, said database being
> recorded in a computer-readable medium and including database
> records for substantially all Wi-Fi access points in the target area,
> each record including identification information for a
> corresponding Wi-Fi access point and calculated position
> information for the corresponding Wi-Fi access point, wherein said
> calculated position information is obtained from recording multiple
> readings of the Wi-Fi access point <u>at different locations around the
> Wi-Fi access point so that the multiple readings have</u> ~~to provide~~
> reference symmetry <u>relative to other Wi-Fi access points in the
> target area</u> ~~when calculating~~ <u>and so that the calculation of</u> the
> position of the Wi-Fi access point ~~and to~~ avoid<u>s</u> arterial bias in the
> calculated position information; <u>and</u>
>
> computer-implemented logic to add records to the database for
> newly-discovered Wi-Fi access points said computer logic
> including logic to recalculate position information for Wi-Fi access
> points previously stored in the database to utilize position
> information for the newly-discovered <u>readings of previously stored</u>
> Wi-Fi access points.

Id. at GSHFED183.

17. The applicants also provided detailed remarks in which they argued the amended claims were patentable over the prior art. *Id.* at GSHFED185-91. The applicants stated, *inter alia*:

> In contrast to the cited references, applicants' claim 1 is directed to a Wi-Fi location server that includes position information for Wi-Fi access points without arterial bias. Specifically, the calculated position information for the Wi-Fi access points is obtained from recording multiple readings of the Wi-Fi access point at different locations around the Wi-Fi access point. These multiple readings have reference symmetry relative to other Wi-Fi access points in the target area. Thus, the calculation of the position of the Wi-Fi access point avoids arterial bias in the calculated position information. This technique of gathering readings from Wi-Fi access points results in higher quality estimates of access point locations and more complete information about the access points in the area. Consequently, devices using the calculated access point locations to determine their position have more accurate estimations of their locations. See Application at ¶¶ 41-44.
>
> As set forth above, none of the cited reference teach or suggest conducting an audit of an area to build a reference database of the locations of Wi-Fi access points in a target area so as to provide reference symmetry and avoid arterial bias. As stated in the application, amateur scanners ("wardrivers") have attempted to collect access point location data for use in location estimation systems. However, the methods employed by wardrivers suffer from several drawbacks. Namely, as described in the application, the location data collected by the wardrivers is often inaccurate, incomplete, and grows organically rather than being collected in a systematic fashion to purposefully avoid arterial bias. See Application at ¶¶ 15-17.
>
> As explained in greater detail in the application, significant errors in position calculation can result when the reference points used for the calculation lack symmetry around the physical location of the device performing the calculation. Unsymmetrical location data (or "arterial bias") occurs when individuals (e.g., wardrivers) collect location data for Wi-Fi access points without following designated scanning routes. Such data tends to aggregate around heavily traffic areas (or "arteries"). Attempting to use arterially biased data to estimate the location of a mobile device causes a "location pull" towards the main arteries regardless of where the

user is currently located. This causes substantial accuracy errors in the location estimation. Figures 5 and 6 of the application illustrate this effect. See Application at ¶¶ 15 and 44.

Collecting multiple readings of Wi-Fi access points in a systematic fashion, as described in the application, provides reference symmetry within the target area. Thus, the distribution of reference points (i.e., Wi-Fi access point locations) is symmetric. By using a collection of location data that is symmetric, a mobile device attempting to calculate its location typically encounters physical locations in which there are numerous access point locations on all sides of the device within range of the device's Wi-Fi radio. Therefore, a position calculation performed by the mobile device will have reduced location bias and will be more accurate as a result. See Application at ¶ 44.

Unlike the cited references and known methods described in the background of the application, applicants' claim 1 clearly recites the calculated position information is obtained from recording multiple readings of the Wi-Fi access point at different locations around the Wi-Fi access point so that the multiple readings have reference symmetry relative to other Wi-Fi access points in the target area and so that the calculation of the position of the Wi-Fi access point avoids arterial bias in the calculated position information. The application describes the discovery of the arterial bias problem and the advantages of the solutions devised by applicants. Namely, by performing a planned audit, and avoiding arterial bias, applicants at least achieve more complete information about access points in the target area, higher quality estimates of access point locations, and reference symmetry. See Application at ¶¶ 47-51.

None of this is taught or suggested by the cited references. Thus, applicants submit that claim 1 is patentable over the cited references.

Id. at GSHFED0000187-89.

18.   As to the Examiner's objection to the "radius on the order of tens of miles"

limitation as "leav[ing] the claim open ended," the Applicants argued that the limitation "clearly

communicates that the claimed target area is larger than, for example, a single floor of a

building, such as might be found in an indoor positioning system. See Application at ¶ 16.

Applicants describe throughout the application an embodiment that includes position information for Wi-Fi access points within a large metropolitan area." *Id.* at GSHFED190.

19.   The Examiner allowed the claims of the '988 patent on May 5, 2008. In doing so, he did not give any detailed reasoning, merely stating that amended claim 1, which he quoted verbatim, was patentable over two prior art references. He did not comment on his earlier rejection of claim 1 as "open ended." *Id.* at GSHFED168-72. The '988 patent issued on August 19, 2008. Ex. C.

B.   **Prosecution History of the '694 Patent**

20.   During the prosecution of the '694 patent, the Examiner rejected claims 1 and 2 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application Publication No. 2004/0039520 (Khavakh) in view of U.S. Patent Application Publication No. 2004/0058640 (Root). Ex. H at GSHFED311. The examiner stated that Khavakh teaches a database of Wi-Fi access points recorded on a computer-readable medium, each record containing calculated position information for each Wi-Fi access point, and calculated position information obtained from multiple readings of Wi-Fi access point to provide reference symmetry and to avoid arterial bias. *Id.*

21.   The examiner stated that Root teaches having a radius on the order of tens of miles. *Id.*

22.   The examiner determined that it would have been obvious to provide the teaching of Root into the system of Khavakh to predict events within a particular special range of a particular dynamic special location; therefore claim 1 was rejected. Ex. H at GSHFED312.

23.   Claim 2 was rejected because the combination of Khavakh and Root teaches the database of claim 1 having records for a plurality of target areas, organized by target areas. *Id.*

24.   On April 7, 2008, the Applicants held a telephonic interview with the Examiner. *Id.* at GSHFED298.

25.   One day later, on April 8, 2008, the Applicants amended claim 1 to "more particularly recite characteristics of the calculated position information," and submitted that the amendments overcome the rejection. Ex. H at GSHFED295-99. Specifically, the Applicants amended the fourth limitation of claim 1 of the '694 patent (regarding the avoidance of arterial bias) and added the fifth limitation (regarding the provision of reference symmetry):

> A database of Wi-Fi access points for at least one target area having a radius on the order of tens of miles,
>
> said database being recorded in a computer-readable medium and including database records for substantially all Wi-Fi access points in the target area,
>
> each record including identification information for a corresponding Wi-Fi access point and calculated position information for the corresponding Wi-Fi access point,
>
> wherein said calculated position information is obtained from recording multiple readings of the Wi-Fi access point at different locations around the Wi-Fi access point so that the multiple readings to provide reference symmetry when calculating the position of the Wi-Fi access point and to avoid arterial bias in the calculated position information of the Wi-Fi access point, and
>
> wherein the database records for substantially all Wi-Fi access points in the target area provide reference symmetry within the target area.

Id. at GSHFED297.

26.   According to the Applicants' Remarks accompanying the Amendment, "During the telephone call, applicants submitted that the cited references do not teach or suggest these features [*i.e.*, the claims as amended]. Examiner Danh stated that the amendments overcome the cited references." *Id.* at GSHFED298.

27.   The Examiner issued a Notice of Allowability on June 16, 2008. *Id.* at

GSHFED285-88. The '694 patent issued on October 7, 2008. Ex. D.

C.   Prosecution History of the '245 and '897 Patents

28.   The Examiner allowed both the '245 and '897 patents to issue with the original

claims as-filed. Ex. I at GSHFED87-90 (September 12, 2007 Notice of Allowabilty re '245

patent); Ex. J at GSHFED392-95 (August 14, 2008 Notice of Allowabilty re '897 patent).

29.   In allowing the '245 patent, Examiner Le identified the limitation "based on the

number of Wi-Fi access points identified via received messages, choosing a corresponding

location-determination algorithm from a plurality of location-determination algorithms, said

chosen algorithm being suited for the number of identified Wi-Fi access points" as the point of

novelty over seven identified U.S. patents or published applications (Masouka, Krumm,

Meunier, Patil, Sheynblat, Vesuna, and Reeves). *See* Ex. I at GSHFED0000089-90.

30.   In allowing the '897 patent eleven months later, Examiner Le identified steps

c) and d) of claim 1 as the point of novelty over the prior art. *See* Ex. J at GSHFED0000394-95

(noting the Choti, Agrawa, Orwant, Biffar, Nagda, and Zellner references). Those limitations

recite:

> c) using the recorded location information for each of the observed
> WiFi access points in conjunction with predefined rules to
> determine whether an observed WiFi access point should be
> included or excluded from a set of WiFi access points
>
> d) using the recorded location information of only the WiFi access
> points included in the set and omitting the recorded location
> information of the excluded WiFi access points to calculate the
> geographical position of the WiFi-enabled device

'897 patent, claim 1. Ex. F at 12:20-30.

IV. SELECTED CLAIM LANGUAGE FROM THE PATENTS-IN-SUIT

31.   The '988 and '694 claims require "a database of Wi-Fi access points for at least one target area . . . . " Ex. C at 14:15; Ex. D at 14:2.

32.   The '988 and '694 claims also require that location information be obtained from "recording multiple recordings of the Wi-Fi access point at different locations around the Wi-Fi access point" using a particular methodology for determining the scanning route. Ex. C at 14:24-31; Ex. D at 14:10-16.

33.   The '988 and '694 patents also require "reference symmetry." Ex. C at 14:27; Ex. D at 14:15.

34.   The '988 patent includes six different limitations directed to "logic":

(1) "computer-implemented logic to add records to the database for newly-discovered Wi-Fi access points" (claim 1);

(2) "logic to recalculate position information for Wi-Fi access points previously stored in the database to utilize position information for the newly-discovered readings of previously stored Wi-Fi access points" (claim 1);

(3) "computer-implemented clustering logic to identify position information based on error prone GPS information" (claim 2);

(4) "logic to determine a weighted centroid position for all position information reported for an access point" (claim 3);

(5) "logic to identify position information that exceeds a statistically-based deviation threshold amount away from the centroid position" (claim 3); and

(6) "the clustering logic . . . excludes such deviating position information from the database and from influencing the calculated positions of the Wi-Fi access points" (claim 3).

Ex. C at 14:15-48.

35.   Claim 1 of the '988 patent requires that "calculated position information is obtained from recording multiple readings of the Wi-Fi access point at different locations around the Wi-Fi access point . . . so that the calculation of the position of the Wi-Fi access point avoids arterial bias in the calculated position information." Ex. C at 14:22-30.

36.   Claim 1 of the '694 patent requires that: "said calculated position information is obtained from recording multiple readings of the Wi-Fi access point at different locations around the Wi-Fi access point so that the multiple readings avoid arterial bias in the calculated position information." Ex. D at 14:9-13.

37.   In claim 1 of the '897 patent, the inventors recite the step of "using the recorded location information for each of the observed WiFi access points in conjunction with predefined rules to determine whether an observed WiFi access point should be included or excluded from a set of WiFi access points." Ex. F at 12:21-25.

38.   Dependent claim 3 further requires "rules to determine a reference point and to compare the recorded location information for each of the observed WiFi access points to the reference point." *Id.* at 12:36-40.

39.   Claim 1 of the '245 patent includes the term "said chosen algorithm being suited for the number of identified Wi-Fi access points." Ex. E at 14:22-23.

Dated: September 14, 2011   Respectfully Submitted,
                                                   Google Inc.,

By its attorneys,

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