

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TCL CORPORATION, TCL COMMUNICATION TECHNOLOGY
HOLDINGS, LTD., TCT MOBILE LIMITED, TCT MOBILE INC., and
TCT MOBILE (US) INC.,
Petitioners,

v.

TELEFONAKTIEBOLAGET L. M. ERICSSON,
Patent Owner.

Case IPR2015-01772
Patent 6,535,815 B2

Before PATRICK R. SCANLON, BARBARA A. BENOIT, and
STACY B. MARGOLIES, *Administrative Patent Judges*.

MARGOLIES, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. §318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

In this *inter partes* review, instituted pursuant to 35 U.S.C. § 314, TCL Corporation, TCL Communication Technology Holdings, Ltd., TCT Mobile Limited, TCT Mobile Inc., and TCT Mobile (US) Inc. (collectively, “Petitioners”) challenge the patentability of certain claims of U.S. Patent No. 6,535,815 (Ex. 1001, “the ’815 patent”), owned by Telefonaktiebolaget LM Ericsson (“Patent Owner”). We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. This Final Written Decision is issued concurrently with Final Written Decisions in IPR2015-01650 and IPR2015-01878, which also involve challenges to the patentability of certain claims of the ’815 patent.

For the reasons discussed below, Petitioners have shown by a preponderance of the evidence that claims 1–3, 8–12, and 15–19 (“the challenged claims”) of the ’815 patent are unpatentable.

A. Procedural History

Petitioners filed a Petition for *inter partes* review of claims 1–3, 8–12, and 15–19 of the ’815 patent. Paper 2 (“Pet.”). On March 1, 2016, we instituted an *inter partes* review of claims 1–3, 8–12, and 15–19 of the ’815 patent on certain asserted grounds of unpatentability. Paper 6 (“Dec.”).

Subsequent to institution, Patent Owner filed a Patent Owner Response to the Petition (Paper 16, “PO Resp.”), to which Petitioners filed a Reply (Paper 19, “Pet. Reply”). An oral hearing was held on December 15, 2016. A transcript of the hearing has been entered into the record. Paper 27 (“Tr.”).

B. Related Matters

The parties identify the following district court proceedings in which the '815 patent has been asserted: *Ericsson Inc. v. TCL Commc'n Tech. Holdings, Ltd.*, No. 2:15-cv-11 (E.D. Tex. 2015) and *Ericsson Inc. v. Apple Inc.*, No. 15-cv-290 (E.D. Tex. 2015). Pet. 1–2; Paper 5, 2–3.

The parties also identify other matters that would affect, or be affected by, a decision in this proceeding. See 37 C.F.R. § 42.8(b)(2); Pet. 1–2; Paper 5, 2–3; Paper 9, 1–2; Paper 15, 1–2.

Claims of the '815 patent also are subject to *inter partes* review in IPR2015-01650 and IPR2015-01878.

C. The '815 Patent

The '815 patent is directed to a mobile terminal equipped with a GPS receiver that, in response to a request for its current position, determines whether aiding data stored in its memory is sufficient to meet a specified qualify of service. Ex. 1001, Abstract. The '815 patent explains that a GPS receiver typically determines its location by computing distances between the GPS receiver and a number of space-based satellites. *Id.* at 1:12–14. According to the patent, a GPS receiver reads aiding data contained in GPS signals acquired from satellites and computes its location based on that data. *Id.* at 1:17–20, 4:41–48. The '815 patent explains that this process can be time consuming, often requiring several minutes—a prohibitive amount of time for some applications. *Id.* at 1:20–22.

The '815 patent describes a method and system that “avoids unnecessary requests for aiding data, thereby reducing network traffic” and “reduc[ing] charges . . . incurred by users for retrieving aiding data from the network.” *Id.* at 2:35–40.

Figure 1 of the '815 patent, below, illustrates mobile communication system 10 that supports communications with GPS-equipped mobile terminals 100:

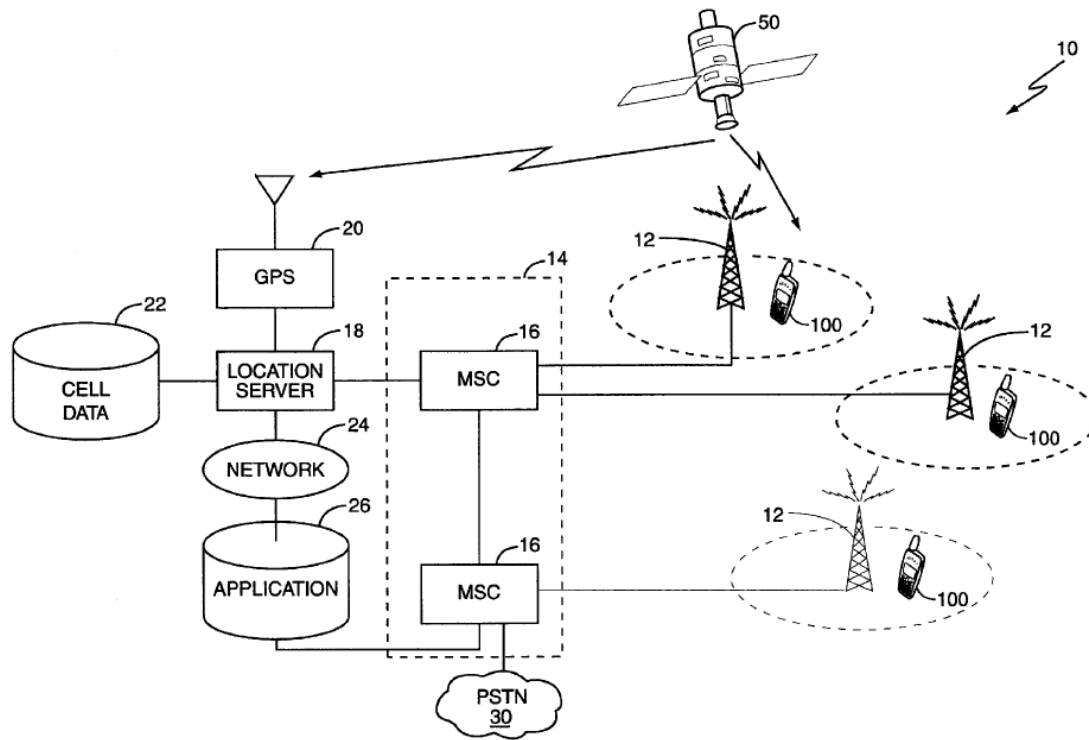


FIG. 1

Id. at 3:11–14. As illustrated in Figure 1 above, mobile communication system 10 includes mobile terminals 100, base stations 12, and core network 14 having one or more mobile switching centers (MSCs). *Id.* at 3:14–17. Location server 18 provides aiding data to mobile terminals 100 when needed to perform position calculations. *Id.* at 3:34–38. According to the patent, “[t]he aiding data includes information broadcast by the satellites 50 in the GPS constellation, including precise orbits (ephemeris) and clock corrections, corrections for ionospheric and propagation delays, and coarse long-term orbits (almanac).” *Id.* at 3:42–46. Position application 26 may be a location-dependent information service that provides location-specific

information, such as the nearest restaurant, to a requesting mobile terminal. *Id.* at 4:4–9. The '815 patent states that positioning application 26 may execute on application servers external to mobile terminal 100 (either within or outside of mobile communication network 10) or may execute within mobile terminal 100 or core network 14. *Id.* at 3:58–65.

Figure 2 of the '815 patent, shown below, illustrates components of mobile terminal 100:

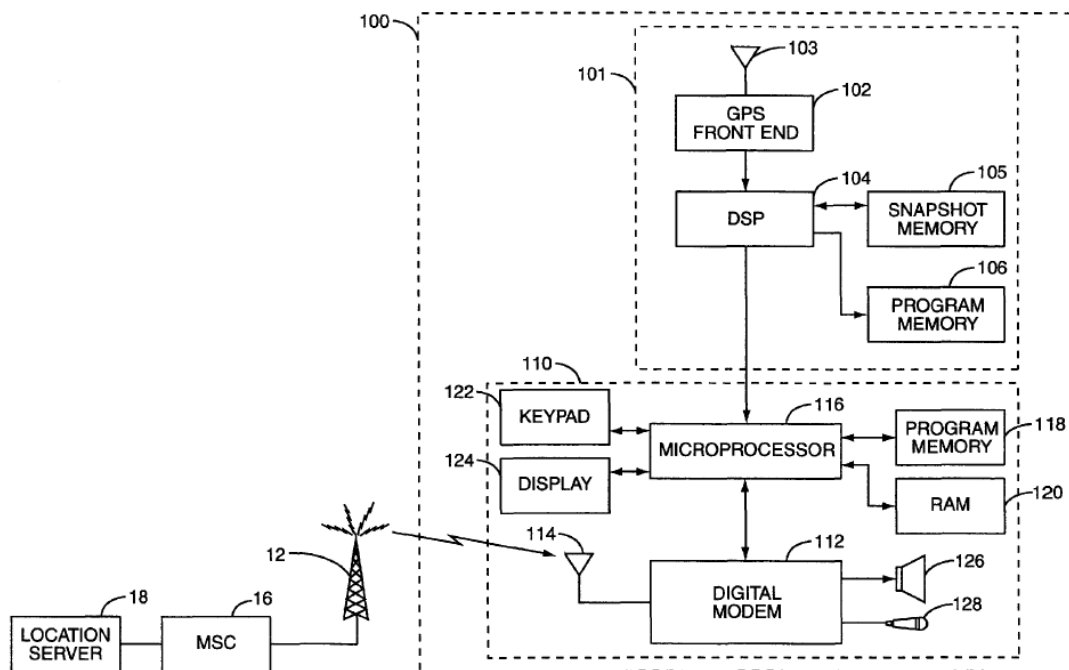


FIG. 2

Id. at 4:9–10. As illustrated in Figure 2 above, mobile terminal 100 includes snapshot memory (also called data memory) 105 that stores aiding data that is extracted from GPS signals or received from the network. *Id.* at 4:41–43.

The '815 patent discloses that, “[a]ccording to the present invention,” positioning application 26 “running either within the mobile terminal 100 itself or in the mobile communication network 10” requests a position update from mobile terminal 100. *Id.* at 5:26–29. Microprocessor 116

“determines a desired quality of service (QoS).” *Id.* at 5:29–30. The ’815 patent explains:

To make this determination of QoS, microprocessor 116 may, for example, prompt the user with a menu of choices related to desired positioning quality of service (QoS). One such menu could contain selections such as “Most accurate,” “Fastest,” “Least Expensive.” In this example, the user chooses the desired QoS from the menu. Alternatively, the positioning application 26 executing in microprocessor 116 could automatically utilize a default QoS value, which the user has previously chosen for a particular application and stored in data memory 120. The QoS parameters could also be supplied to the mobile terminal 100 by the requesting application.

Id. at 5:30–42. The ’815 patent discloses that, depending on the desired QoS, the microprocessor “may provide aiding data stored in its own data memory 120 to the GPS receiver 101 to use in performing position calculations, or it may instruct the GPS receiver 101 to acquire current aiding data from a GPS satellite 50.” *Id.* at 5:42–48.

Figure 3 of the ’815 patent, shown below, illustrates a flow chart of a procedure implemented in mobile terminal 100 for acquiring aiding information:

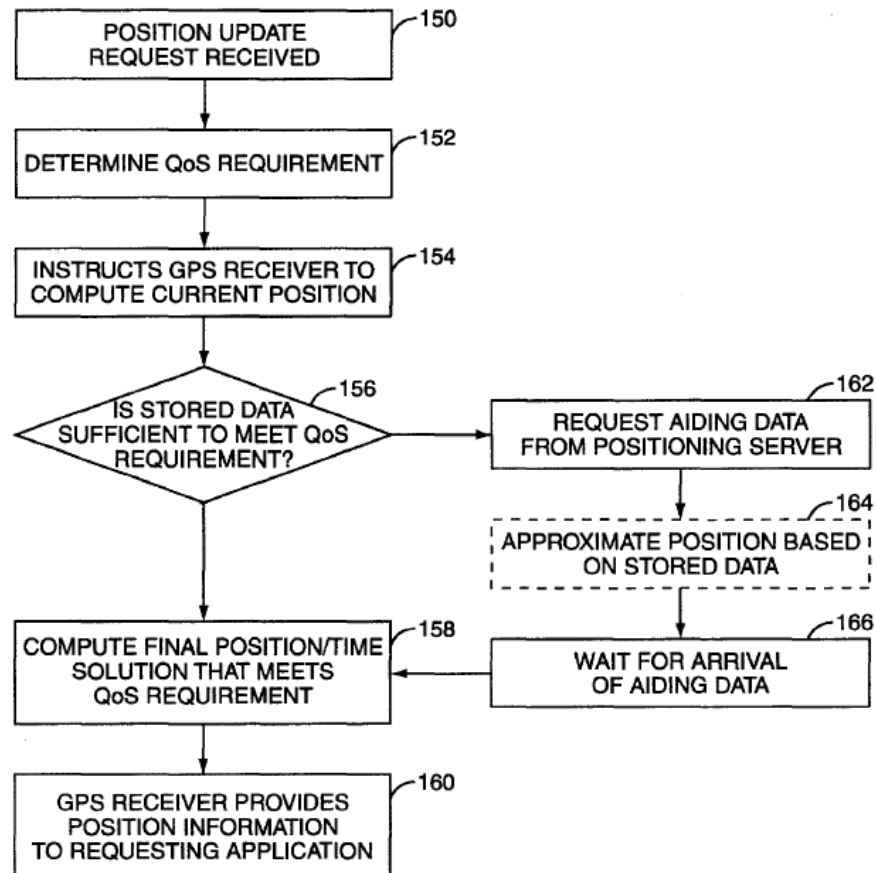


FIG. 3

Id. at 2:47–49, 5:52–53. As illustrated in Figure 3 above, at block 150, microprocessor 116 of mobile terminal 100 receives a position request for the mobile terminal's current position. *Id.* at 5:53–55. The request could originate from positioning application 26 running either on the mobile terminal or external to the mobile terminal. *Id.* at 5:55–58. The position request also could be responsive to a request by mobile terminal 100 for information, such as the nearest restaurant. *Id.* at 5:58–61.

At block 152, microprocessor 116 determines the desired quality of service (QoS) for making position estimates. *Id.* at 5:62–63. The '815 patent states that microprocessor 116 may prompt the user with a menu of

choices related to desired QoS, positioning application 26 could specify a QoS value in the position request, or a default QoS value stored in data memory 120 could be used. *Id.* at 5:62–6:4.

At block 154, microprocessor 116 instructs GPS receiver 101 to compute the current position of mobile terminal 100 based on the specified QoS. *Id.* at 6:6–9. Next, at block 156, either GPS receiver 101 or microprocessor 116 estimates if the currently stored aiding data is sufficient to meet the desired QoS requirements. *Id.* at 6:13–18. If the data is sufficient, GPS receiver can use the stored aiding data to acquire the GPS satellite signals and compute a position/time solution, per block 158, and returns that position/time solution to the requesting application, per block 160. *Id.* at 6:43–49. If the stored aiding data is not sufficient to meet the desired QoS requirements, then in block 162 either GPS receiver 101 or microprocessor 116 requests aiding data from location server 18. *Id.* at 6:54–57. GPS receiver 101 or microprocessor 116 optionally estimates position based on the data stored in memory (block 164) as it waits for the arrival of the aiding data (block 166). *Id.* at 6:57–65. Once GPS receiver or microprocessor 116 has received the new aiding data, it computes the position/time solution that is expected to meet QoS requirements (block 158), and provides that position information to the requesting application (block 160). *Id.* at 7:10–13, 7:18–21.

D. Illustrative Claims

Among the challenged claims, claims 1 and 17 are independent. Claims 1, 8, and 17 are illustrative of the challenged claims and read as follows:

1. A method implemented by a mobile terminal for determining the current position of a mobile terminal, said method comprising:

receiving a request for said current position of said mobile terminal;

determining a desired quality of service;

determining whether aiding data stored in said mobile terminal is sufficient to compute an estimate of said current position meeting said desired quality of service; and

obtaining additional aiding data from a remote source if said stored aiding data is insufficient to compute said estimate of said current position meeting said desired quality of service.

8. The method of claim 1 wherein said determining a desired quality of service comprises receiving a specified quality of service from a requesting application.

17. A mobile terminal comprising:

a positioning receiver;

a processor for computing current position based on navigation signals received by said positioning receiver; said processor programmed to:

determine a desired quality of service for the computation of current position;

determine whether aiding data stored in said mobile terminal is sufficient to compute an estimate of said current position meeting said desired quality of service; and

obtain additional aiding data from a remote source external to the mobile terminal if said stored aiding data is insufficient to compute said estimate of said current position meeting said desired quality of service.

Id. at 7:30–43, 7:60–62, 8:25–40.

E. Asserted Grounds of Unpatentability

We instituted an *inter partes* review of claims 1–3, 8–12, and 15–19 of the ’815 patent on the following grounds:

References	Basis	Challenged Claim(s)
Camp ¹ and Kingdon ²	35 U.S.C. § 103 ³	1–3, 8, 9, 11, 12, 15, 17–19
Camp, Kingdon, and Gilbert ⁴	35 U.S.C. § 103	10
Camp, Kingdon, and Kurby ⁵	35 U.S.C. § 103	16

II. DISCUSSION

A. Principles of Law

To prevail in challenging Patent Owner’s patent claims, Petitioners must demonstrate by a preponderance of the evidence that the claims are unpatentable. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). “In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to

¹ WO 99/44073, published Sept. 2, 1999 (Ex. 1023, “Camp”).

² WO 99/46949, published Sept. 16, 1999 (Ex. 1025, “Kingdon”).

³ The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), revised 35 U.S.C. § 102 103, effective March 16, 2013. Because the challenged patent was filed before March 16, 2013, we refer to the pre-AIA version of § 103 in this decision.

⁴ U.S. Patent No. 6,377,891, filed Feb. 12, 1999, issued Apr. 23, 2002 (Ex. 1022, “Gilbert”).

⁵ U.S. Patent No. 5,999,125, issued Dec. 7, 1999 (Ex. 1027, “Kurby”).

each claim”)). This burden never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (citing *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1326–27 (Fed. Cir. 2008)) (discussing the burden of proof in *inter partes* review). Furthermore, a petitioner cannot satisfy its burden of proving obviousness by employing “mere conclusory statements.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

Petitioners assert that certain claims of the ’815 patent are unpatentable under 35 U.S.C. § 103(a) as obvious. A claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time of the invention to a person having ordinary skill in the art. *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). “A determination of whether a patent claim is invalid as obvious under § 103 requires consideration of all four *Graham* factors, and it is error to reach a conclusion of obviousness until all those factors are considered.” *Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1048 (Fed. Cir. 2016) (en banc) (citations omitted). “This requirement is in recognition of the fact that each of the *Graham* factors helps inform the ultimate obviousness determination.” *Id.*

B. Level of Ordinary Skill

In determining whether an invention would have been obvious at the time it was made, 35 U.S.C. § 103 requires us to resolve the level of ordinary skill in the pertinent art at the time of the invention. *Graham*, 383 U.S. at 17. “The importance of resolving the level of ordinary skill in the art lies in the necessity of maintaining objectivity in the obviousness inquiry.” *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991). The person of ordinary skill in the art is a hypothetical person who is presumed to have known the relevant art at the time of the invention. *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). Factors that may be considered in determining the level of ordinary skill in the art include, but are not limited to, the types of problems encountered in the art, the sophistication of the technology, and educational level of active workers in the field. *Id.* at 1579. In a given case, one or more factors may predominate. *Id.* Generally, it is easier to establish obviousness under a higher level of ordinary skill in the art. *Innovention Toys, LLC v. MGA Entm’t, Inc.*, 637 F.3d 1314, 1323 (Fed. Cir. 2011) (“A less sophisticated level of skill generally favors a determination of nonobviousness . . . while a higher level of skill favors the reverse.”).

Petitioners’ declarant Dr. Goldberg opines that one of ordinary skill in the art

would have had either: (1) a graduate degree in computer engineering, electrical engineering, applied physics or a related field, and at least three years’ experience in the design and development of GPS based location services, systems, and/or devices or (2) a bachelor degree in computer engineering, electrical engineering, applied physics or a related field, and at least five years’ experience in the design and development of GPS based location services, systems, and/or devices.

Ex. 1054 ¶ 64. Dr. Goldberg explains that he determined the characteristics of a hypothetical person of ordinary skill in the art of the '815 patent as of December 22, 2000 based on his review of the '815 patent and prior art references cited in the '815 patent and referenced in his declaration and on his “knowledge of positioning technologies for mobile terminals equipped with a positioning receiver, including [his] work on multiple GPS based navigational and tracking technologies, which included a product line for tracking people and cargo using cellular phones equipped with GPS receivers.” *Id.*

Patent Owner does not challenge Dr. Goldberg’s testimony regarding the level of skill in the art. *See generally* PO Resp. However, Mr. Blackburn, Patent Owner’s declarant, opines that a person of ordinary skill in the art

would probably have had a graduate degree in computer engineering, electrical engineering, applied physics, or a related field, and at least three years’ experience in the design and development of GPS *or cellular* location services, systems, and/or devices or (2) a Bachelor’s degree in computer engineering, electrical engineering, applied physics, or a related field, and at least five years’ experience in the design, *analysis*, and/or development of GPS, *cellular and PSTN* location services, systems, and/or devices.

Ex. 2005 ¶ 11 (emphases added). As illustrated by the emphasized words above, Mr. Blackburn’s proposed level of ordinary skill differs slightly from Dr. Goldberg’s. Patent Owner, however, does not cite the above testimony in its Patent Owner Response. Nor does Patent Owner or Mr. Blackburn explain the reason for including cellular and PSTN location services, or for

adding analysis as an alternative in the description of experience in the field.
See generally PO Resp.

We determine that the level of ordinary skill proposed by Petitioners' declarant is consistent with the challenged patent and the asserted prior art, and we therefore adopt Dr. Goldberg's definition of the level of ordinary skill in the art for the purposes of the analysis below. However, our analysis would not differ if we were to adopt Mr. Blackburn's definition.

C. Claim Construction

In an *inter partes* review, we construe claim terms in an unexpired patent according to their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard). Consistent with the broadest reasonable construction, claim terms are presumed to have their ordinary and customary meaning as understood by a person of ordinary skill in the art in the context of the entire patent disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). An inventor may provide a meaning for a term that is different from its ordinary meaning by defining the term in the specification with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

Petitioners propose constructions for a number of terms. Pet. 16–23. Patent Owner “generally agrees that the constructions proposed by [Petitioners] are in keeping with how a [person of ordinary skill in the art] would have understood those terms,” except that Patent Owner maintains that Petitioners' proposed construction of “quality of service” must be

construed as part of the larger phrase “determining a desired quality of service.” PO Resp. 10. Patent Owner proposes a construction for the larger phrase, PO Resp. 10–20, with which Petitioners disagree, Pet. Reply 2–11. For purposes of this decision, we determine that only “quality of service” (as recited in claims 1 and 17) requires express construction, as explained below.

Independent claim 1 recites “determining a desired quality of service.” Independent claim 17 similarly recites a processor programmed to “determine a desired quality of service for the computation of current position.” Petitioners assert that the phrase “quality of service” means “an indication of grade or level of performance associated with a computed position estimate.” Pet. 16 (emphasis omitted). Petitioners argue that even though the specification of the ’815 patent does not explicitly define “quality of service,” the specification provides examples that are consistent with Petitioners’ proposed construction. *Id.* at 16–17. Petitioners also argue that the applicant’s statements during prosecution are consistent with Petitioners’ construction, and that Petitioners’ construction is supported by the prior art. *Id.* at 17–18.

Patent Owner argues that the larger phrase “determining a desired quality of service” should be construed, and that it means “ascertaining a quality of service associated with a computed position estimate as a function of any user- or position application-selectable input related to quality of service.” PO Resp. 11 (emphasis omitted). Patent Owner maintains that its construction is consistent with the specification and prosecution history of the ’815 patent. *Id.* at 11–20. Patent Owner argues that the term “desired” reflects that “a QoS value or parameter (*i.e.*, a QoS input) is *selected* by a

user or a positioning application.” *Id.* at 13 (emphasis added). Patent Owner maintains that the three embodiments for determining a desired quality of service described in the ’815 patent enable the user of the mobile terminal or the positioning application “to *choose* a QoS input . . . using the mobile terminal.” *Id.* at 14 (emphasis added). Patent Owner also argues that the desired QoS is not sent from the cellular network to the mobile terminal. *Id.* at 16 (citing Ex. 2005 ¶ 55). Patent Owner asserts that, during prosecution, “the Examiner distinguished a mobile terminal ‘determining a desired quality of service’ and [cited prior art reference] Havinis’s teaching of a network communicating quality of service parameters to a mobile terminal as part of a positioning request,” as Petitioners assert. *Id.* at 18.

For the reasons explained below, we conclude that “determining a desired quality of service” is not limited to determining a quality of service “as a function of any user- or position application-selectable input related to quality of service,” as Patent Owner asserts. We also determine that the broadest reasonable interpretation of the phrase “quality of service” is “an indication of grade or level of performance associated with a computed position estimate.”

First, the ’815 patent and its prosecution history do not support Patent Owner’s narrow reading. The ’815 patent discloses that a GPS receiver can optimize the time for estimating its current position and minimize radio network traffic “based on one or more quality of service (QoS) parameters.” Ex. 1001, 2:54–58. The patent explains that “[t]hese QoS parameters may be computed internally within the mobile terminal or *received in a position request from the network.*” *Id.* at 2:58–60 (emphasis added). The patent

further explains that the microprocessor in the mobile terminal determines a desired QoS. *Id.* at 5:29–30, Fig. 2. Specifically, the '815 patent discloses:

To make this determination of QoS, microprocessor 116 may, for example, prompt the user with a menu of choices related to desired positioning quality of service (QoS). One such menu could contain selections such as “Most accurate,” “Fastest,” “Least Expensive.” In this example, the user chooses the desired QoS from the menu. Alternatively, the positioning application 26 executing in microprocessor 116 could automatically utilize a default QoS value, which the user has previously chosen for a particular application and stored in data memory 120. *The QoS parameters could also be supplied to the mobile terminal 100 by the requesting application.*

Id. at 5:30–42 (emphasis added); *see also id.* at 5:62–6:4 (similarly disclosing that the positioning application 26 could specify a QoS value in the position request). The '815 patent discloses that the requesting application (the positioning application 26 that requests the position update) may be external to the mobile terminal 100, either within or outside of the mobile communication network 10 (shown in Figure 1). *Id.* at 3:58–60.

Thus, the specification of the '815 patent discloses that “determining a desired quality of service” includes receiving a QoS parameter or value from an application external to the mobile terminal and within or outside the communication network. The specification also discloses that the QoS parameter may be received in a position request from the network. The specification describes selection of menu choices for only one of the embodiments. The specification does not require selection of an input (by either the user or the position application) to indicate a desired QoS.

Moreover, the claims of the '815 patent do not support Patent Owner's narrow reading. Dependent claim 8 recites “[t]he method of claim

1 wherein determining a desired quality of service comprises receiving a specified quality of service from a requesting application.” *Id.* at 7:60–62. Thus, the “determining a desired quality of service” of claim 1 at least encompasses the embodiment recited in claim 8 in which a specified quality of service comes from a requesting application. As explained above, the ’815 patent discloses that that requesting application may be external to the mobile terminal itself. Also, claim 8 does not require that the desired quality of service be a selectable input. Dependent claim 10—which recites that the determining a desired quality of service comprises “prompting a user to input said desired quality of service; and receiving input from said user indicating said desired quality of service”—covers such a feature. But claim 1 is not so limited.

Furthermore, Patent Owner’s arguments based on the prosecution history of the ’815 patent lack merit. First, Patent Owner’s attempt to limit the claims based on the applicant’s characterization of its invention is unpersuasive. PO Resp. 17–18. The passages in the file history in which the applicant describes the invention “by way of example” essentially repeat the description in the specification of the three embodiments for determining a desired quality of service and do not clearly disavow claim scope such that the determining requires a user- or position application-selectable input. *Compare* Ex. 1002, 48, 60, *with* Ex. 1001, 5:30–42. Second, Patent Owner’s reliance on the Examiner’s allowance of the claims over the Havinis reference also lacks merit. *See* PO Resp. 18–19. The applicant did not distinguish Havinis based on the “determining a desired quality of service” limitation; rather, the applicant distinguished Havinis based on the last two limitations of claim 1. Ex. 1002, 62–63; *see also id.* at 48–51. The

Examiner did not interpret the phrase “a desired quality of service” or distinguish a mobile terminal determining a desired quality of service from a network communicating quality of service parameters to a mobile terminal, as Patent Owner argues. *See* PO Resp. 18–19.

Petitioners’ proposed construction of “quality of service,” on the other hand, is consistent with the ’815 patent specification. The specification, for example, describes evaluating criteria such as “accuracy,” “time-to-first-fix” and “sensitivity.” Ex. 1001, 6:9–24. The specification also gives the following examples of quality of service: “Most accurate,” “Fastest,” and “Least Expensive.” *Id.* at 5:33–36. Moreover, Petitioners’ declarant, Dr. Goldberg, persuasively testifies that the attributes of accuracy, time-to-first-fix (TTFF), sensitivity, speed, and cost are all indications of a grade or level of performance that is to be associated with the computed position estimate. Ex. 1054 ¶ 155. Petitioners’ proposed construction also is supported by the applicant’s statements during prosecution of the ’815 patent and a description of quality of service in a prior art reference as referring to, for example, accuracy, periodicity, and response time. *See* Pet. 17–18 (citing Ex. 1002, 50; Ex. 1005, 5; Ex. 1054 ¶¶ 155, 156). Patent Owner does not challenge Petitioners’ proposed construction of the shorter phrase “quality of service.” *See* PO Resp. 9–20. We determine that the common term “desired”—for which there is no special definition or disavowal in the specification—need not be expressly construed. *See* Pet. Reply 3–4.

For the foregoing reasons, the broadest reasonable interpretation of “determining a desired quality of service,” as recited in claim 1, and “determine a desired quality of service,” as recited in claim 17, is not limited

to “ascertaining a quality of service associated with a computed position estimate as a function of any user- or position application-selectable input related to quality of service,” as proposed by Patent Owner. We also determine that, contrary to Patent Owner’s unsupported argument, the desired QoS may be received from the cellular network. Moreover, for the reasons explained above, we determine that the broadest reasonable interpretation of “quality of service” is “an indication of grade or level of performance associated with a computed position estimate.”

D. Asserted Obviousness over Camp and Kingdon

Petitioners contend that claims 1–3, 8, 9, 11, 12, 15, and 17–19 of the ’815 patent are unpatentable under 35 U.S.C. § 103(a) as obvious over Camp and Kingdon. Pet. 3, 23–48. Petitioners cite to the prior art references and rely on declaration testimony of Dr. Goldberg. *Id.* at 23–48 (citing Ex. 1054). Furthermore, Petitioners provide analysis purportedly explaining how the combination would have conveyed to one of ordinary skill in the art the claim limitations and provide reasons why one of ordinary skill in the art would have combined the teachings of the references. *Id.*

With support of the declaration of Mr. Blackburn (Ex. 2005), Patent Owner challenges Petitioners’ contentions, arguing that the references do not teach certain claim limitations and that a person of ordinary skill in the art would not have been motivated to combine the references in the manner proposed by Petitioner. PO Resp. 26–34. In reply, Petitioners maintain their position that the subject matter of claims 1–3, 8, 9, 11, 12, 15, and 17–19 would have been obvious in view of the teachings of Camp and Kingdon. Pet. Reply 12–20.

We have reviewed the Petition, Patent Owner’s Response, and Petitioner’s Reply, as well as the relevant evidence discussed in those papers. For reasons that follow, we determine that Petitioners have shown by a preponderance of the evidence the subject matter of claims 1–3, 8, 9, 11, 12, 15, and 17–19 would have been obvious in view of the teachings of Camp and Kingdon.

1. Summary of Camp

Camp is a PCT application titled “Stand Alone Global Positioning System (GPS) and Method with High Sensitivity.” Ex. 1023, [54]. Camp was published September 2, 1999, and is prior art under 35 U.S.C. § 102(b) to the ’815 patent, which issued from an application filed December 22, 2000. *Compare* Ex. 1026, [43], *with* Ex. 1001, [22].

Camp discloses as background that a GPS receiver at a user terminal receives signals transmitted from GPS satellites and determines its position by computing relative times of arrival of such signals. Ex. 1023, 1:19–22.⁶ Camp states that the satellite signals include as part of their navigation message data on the orbital position of the satellite—called ephemeris data—and clock correction data. *Id.* at 1:22–25. Camp discloses that the process of searching for appropriate GPS signals, receiving the satellite signals, and computing location “is a lengthy process, often requiring several minutes or more” and that such processing times “are generally unacceptable in portable devices as they greatly reduce battery life.” *Id.* at 1:25–2:2.

⁶ The citations to Camp are to pages of the Camp PCT application rather than to the exhibit page numbers added by Petitioners.

Camp also discloses that known GPS receivers use correlation methods to compute the pseudo-range for each satellite, which is the time delay measured between the received signal from the satellite and a local clock at the GPS receiver. *Id.* at 2:3–6.

Camp also discloses that GPS receivers must work outdoors with a clear line of sight to four satellites, and that GPS receivers encounter problems in portable applications or in areas where there is significant foliage or other obstructions such as buildings. *Id.* at 3:16–22.

Camp discloses a method for determining the position of a user terminal in which an auxiliary communications system with a central server sends satellite information to the user terminal. *Id.* at 4:10–13. The communications system also sends to the user terminal the approximate location of the user terminal with respect to a location remote from the user terminal, such as a base station. *Id.* at 4:13–15, 5:27–6:2.

Camp also discloses testing whether orbital data and clock correction data retained at the user terminal are “sufficiently current” to be used to determine the user terminal’s location. *Id.* at 6:3–7. If the data is not sufficiently current, then the user terminal requests a central server via a communications link for more current data. *Id.* at 6:7–9.

Figure 1 of Camp is shown below:

Fig. 1

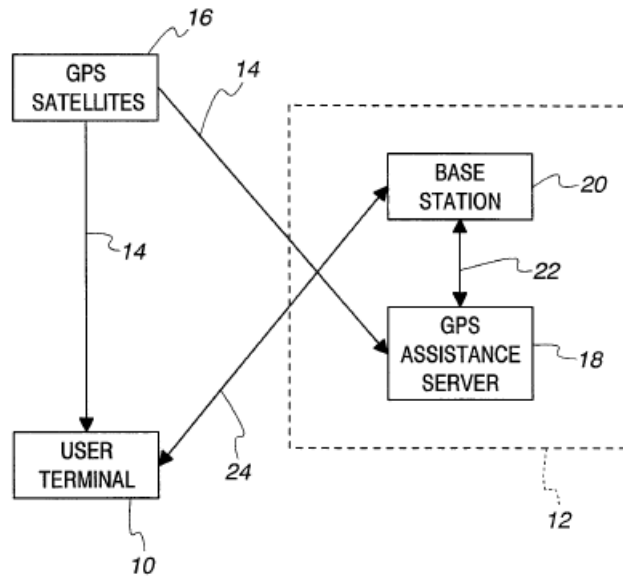


Figure 1 above shows a block diagram of a GPS environment that includes user terminal 10 (which may be any type of mobile communications device such as a cellular phone), auxiliary communications system 12, and GPS satellites 16. *Id.* at 8:13–17, 8:20–23. Auxiliary communications system 12 includes GPS assistance, or central, server 18 and base station 20. *Id.* at 8:23–27. According to Camp, user terminal 10 and auxiliary communications system 12 receive navigation messages 14 from GPS satellites 16. *Id.* at 8:14–16. The navigation messages, or GPS signals, include satellite orbital position data (i.e., ephemeris data) and clock correction data. *Id.* at 8:16–19.

Figure 2 of Camp is shown below:

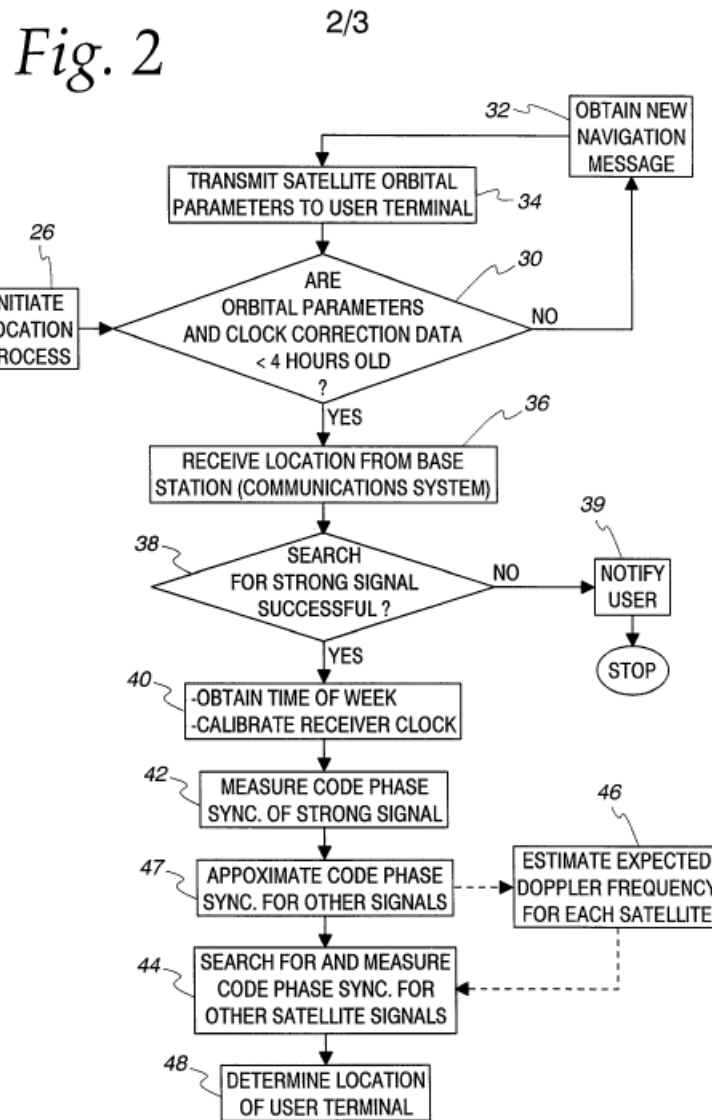


Figure 2 above shows a method for determining the location of a user terminal. *Id.* at 8:7–8. At block 26, an on-demand location request is initiated at the user terminal by, for example, pushing a button or executing a command. *Id.* at 9:21–23. Next, at block 30, the user terminal determines if the orbital ephemeris data and clock correction data for the satellites in view, which has been stored in the user terminal from a prior communication, is less than four hours old. *Id.* at 9:24–27. According to Camp, if the data is not less than four hours old, the user terminal instructs the communications

system to obtain current ephemeris data and clock correction data for the satellites currently in view, per block 32. *Id.* at 9:27–10:2. The communications system obtains the current data and, per block 34, transmits it to the user terminal. *Id.*

2. Summary of Kingdon

Kingdon is a PCT application titled “System and Method for Implementing Positioning Quality of Service.” Ex. 1025, [54]. Kingdon was published September 16, 1999, and is prior art under 35 U.S.C. § 102(b) to the ’815 patent, which issued from an application filed December 22, 2000. *Compare* Ex. 1025, [43], *with* Ex. 1001, [22].

Kingdon discloses that determining the geographical position of a mobile station (such as a portable phone) within a cellular network “has recently become important for a wide range of applications.” Ex. 1025, 1:26–28, 2:23–24. For example, according to Kingdon, positioning services are used to determine the location of a fleet of taxis, to determine the exact location of a mobile station for emergency calls, and to determine the nearest gas station, restaurant, or hospital. *Id.* at 2:24–31.

Kingdon describes a telecommunications system in which an application requesting positioning information of a mobile terminal indicates a desired quality of service such as timeliness or accuracy. *Id.* at Abstract, 5:2–4. Kingdon discloses that the cellular network determines whether the requested quality of service can be achieved, and if so, returns the positioning information. *Id.* at Abstract, 5:4–8. If the requested quality of service cannot be achieved, a failure message is sent to the requesting application. *Id.* at Abstract, 5:8–10.

Figure 3 of Kingdon is shown below:

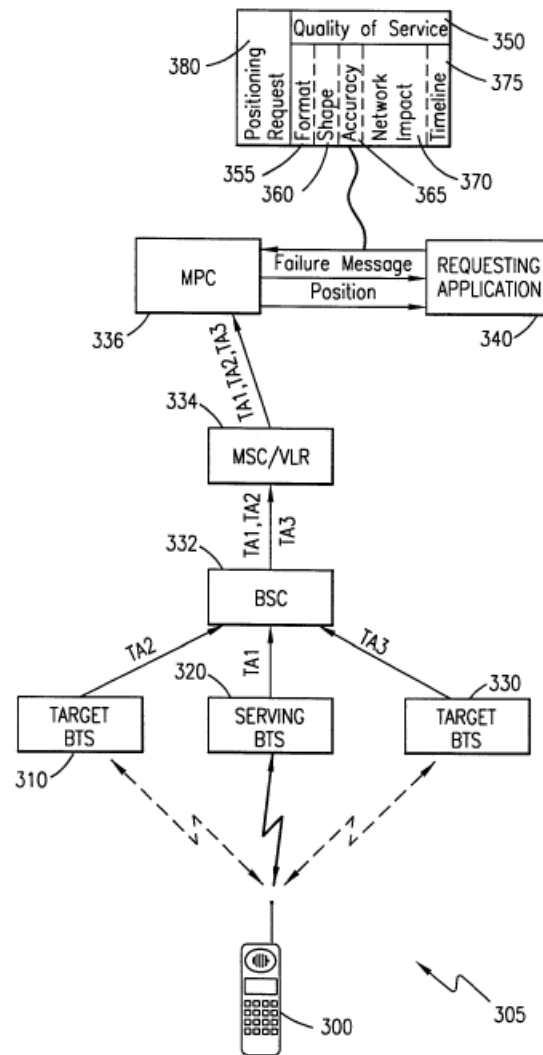


FIG. 3

Figure 3 above illustrates positioning of a mobile terminal within a cellular network based on quality of service information provided by an application requesting positioning. *Id.* at 5:21–23. Kingdon discloses that when application 340 requests positioning of mobile station 300 within cellular network 305, requesting application 340 “can indicate the desired Quality of Service (QOS) 350 of the returned positioning information.” *Id.* at 6:4–7. According to Kingdon, QOS 350 can include accuracy and timeliness of the positioning information. *Id.* at 6:17–21. For example,

Kingdon explains, “the requesting application 340 may need to position the MS 300 immediately, while for other applications 340, the positioning information may not be need to be sent for several minutes, hours or days.”
Id. at 8:30–9:1.

According to Kingdon, desired QOS information 350 is carried as part of positioning request 380. *Id.* at 9:14–17. Figure 4 of Kingdon, below, illustrates how the desired QOS information is used:

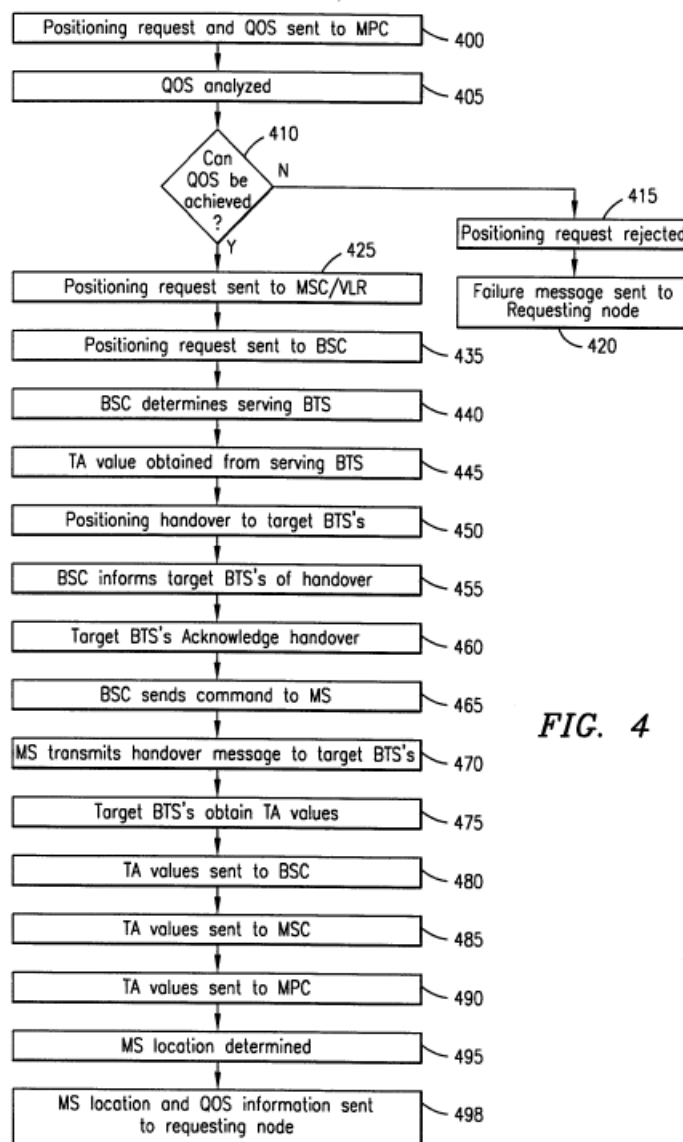


FIG. 4

Id. at 5:24–25. Figure 4 of Kingdon, above, illustrates steps in a sample positioning process which uses quality of service information. *Id.* As illustrated in Figures 3 and 4 above, at step 400, the positioning request and desired QOS is sent to Mobile Positioning Center (MPC) 336 within cellular network 305 serving the area that MS 300 is in. *Id.* at 9:14–17. MPC 336 checks QOS 350 (step 405) and determines whether the positioning can be performed (step 410). *Id.* at 9:17–19. If MPC 336 cannot provide positioning of MS 300 with the requested QOS (step 410), MPC 336 will reject the positioning request (step 415) and inform requesting application 340 that positioning cannot be performed (step 420). *Id.* at 9:19–22. However, if MPC 336 can perform the positioning, a sequence of steps follow, leading to determining the location of MS 300 (step 495). *Id.* at 9:23–10:30. MPC 336 then sends the geographical position of MS 300 and the QOS information to requesting application 340 (step 498). *Id.* at 10:30–11:2.

Kingdon additionally discloses that “the location services can be used by applications located-in or connected-to the subscriber’s MS, by network applications or by external applications.” *Id.* at 11:19–21.

3. Analysis

a. Independent claim 1

i. Preamble

Petitioners contend that Camp discloses the preamble of claim 1— “[a] method implemented by a mobile terminal for determining the current position of a mobile terminal”—by, for example, disclosing that “[a] method is provided for determining the position of a user terminal utilizing global

positioning system (GPS) satellites,” Pet. 37 (quoting Ex. 1023, 4:6–7⁷) and further disclosing that “user terminal 10 may be any type of mobile communications device,” *id.* (quoting Ex. 1023, 8:20–23). Petitioners further assert that, as illustrated in Figure 2 of Camp, “Camp teaches a location process that begins with a location-on-demand request (block 26) by the user pushing a button (*etc.*) of the user terminal, and concludes with user terminal calculating its location (block 48).” *Id.* (citing Ex. 1023, 9:17–14:29, Fig. 2; Ex. 1054 ¶ 201).

Patent Owner does not dispute Petitioners’ contentions that Camp discloses a mobile terminal or that Camp discloses that the mobile terminal determines its current position. *See* PO Resp. 20–21, 26–34. Patent Owner does argue that because Camp and Kingdon do not teach that the mobile terminal itself determines a desired quality of service, the references do not teach that the claimed method, which includes the step of determining a desired quality of service, is “implemented by a mobile terminal.” *Id.* at 26–28.

We agree with Petitioners’ analysis of the preamble (Pet. 37) and adopt it as our own. We also agree with Petitioners’ analysis of the “determining a desired quality of service” step as discussed in Section II.D.3.iii below. Accordingly, we determine that Petitioners have shown that Camp discloses a method implemented by a mobile terminal for determining the current position of a mobile terminal.

⁷ Petitioners’ cites to Camp are to pages of the Camp PCT application rather than to the exhibit page numbers added by Petitioners.

ii. Receiving a request

Petitioners assert that Camp discloses the next limitation of claim 1—“receiving a request for said current position of said mobile terminal”—by disclosing, for example, that “[o]nce a location on-demand request is initiated . . . at the user terminal 10 by pushing a button, executing a command, etc., the method of Fig. 2 proceeds.” Pet. 37 (quoting Ex. 1023, 9:17–23).

Patent Owner does not dispute Petitioners’ contentions that Camp discloses the receiving step of claim 1. See PO Resp. 20–21, 26–34.

We agree with Petitioners’ analysis (Pet. 37) and adopt it as our own. We determine that Petitioners have shown that Camp discloses receiving a request for said current position of said mobile terminal.

iii. Determining a desired quality of service

Claim 1 next recites “determining a desired quality of service.” We determine above that the broadest reasonable construction of “quality of service” is “an indication of grade or level of performance associated with a computed position estimate.” See *supra* Section II.C.

Petitioners contend that the combination of Camp and Kingdon discloses the claimed “determining a desired quality of service.” Pet. 37–39. Petitioners contend that Camp discloses determining whether the orbital ephemeris data and clock correction data stored in the user terminal are less than four hours old. Pet. 38. Petitioners also contend that quality of service is a function of the age of the stored aiding data, in that the older the ephemeris data is, the less accuracy any resulting position computations based on that data are. *Id.* Petitioners also contend that Kingdon expressly discloses a requesting application can indicate a desired quality of service of

the returned positioning information, and that once the MPC receives the positioning request, the MPC checks the desired quality of service. *Id.*

Petitioners assert that a person of ordinary skill in the art “would have been motivated to modify Camp with Kingdon’s teaching of indicating the desired QoS.” *Id.* According to Petitioner,

Camp discloses that a requesting application initiates the on-demand positioning process at step 26 of Fig. 2. Kingdon discloses a requesting application specifying a desired QoS. Thus, the combination of Camp and Kingdon would result in a requesting application specifying a desired QoS that is then analyzed/determined. Moreover, a [person of ordinary skill in the art] would have been motivated to use one or more of Kingdon’s QoS metrics—e.g., timeliness and/or accuracy—in determining whether to use stored aiding data or obtain additional aiding data to compute a position estimate, as disclosed by Camp. For example, modifying Camp in this fashion would reduce data charges by avoiding obtaining data from the network when the ephemeris data is sufficiently accurate (i.e., current enough) to satisfy the specified QoS.

Id. at 39 (citations omitted).

We agree and adopt Petitioners’ analysis as our own. *See* Pet. 37–39. As Petitioners cite, Camp discloses determining whether stored aiding data is older than four hours. Ex. 1023, Fig. 2, 9:24–27. Camp also discloses that this determination is to test whether the data is “*sufficiently* current to be used for the location process.” *Id.* at 6:3–7 (emphasis added). Thus, the four-hour limit is an indication of grade or level of performance associated with a computed position estimate because the older the ephemeris data is, the less accurate the resulting position computation using that data may be. *See* Ex. 1054 ¶ 205. In addition, as Petitioners cite, Kingdon discloses an application indicating a desired quality of service. *See, e.g.*, Ex. 1025, 5:2–4, 6:4–7, 6:16–21. The desired quality of service may be accuracy or

timeliness. *Id.* at 6:16–21, 8:28–9:6. We find persuasive Petitioners’ evidence that an ordinarily skilled artisan would have been motivated to use one or more of Kingdon’s desired metrics, such as timeliness and/or accuracy—in determining whether to use stored aiding data or obtain additional aiding data. *See* Pet. 37–39.

Patent Owner argues that neither Camp nor Kingdon discloses the claimed “determining a desired quality of service.” PO Resp. 26–28. Specifically, Patent Owner argues that neither reference discloses *a mobile terminal* determining a desired quality of service. *Id.* With respect to Camp, Patent Owner asserts that any reduction in charges from reducing the sending and receiving of data over the network is “not the result of a user or positioning application selecting, for example, a QoS value such as ‘cheapest’ and the mobile terminal determining a resulting desired QoS.” *Id.* at 27. With respect to Kingdon, Patent Owner asserts that “[a]lthough Kingdon discloses a positioning application requesting a particular QoS, the QoS in Kingdon [is] used by the mobile positioning center (*i.e.*, the network) to determine a mobile terminal’s location.” *Id.* Patent Owner also argues that “even if Kingdon is considered to ‘determine a QoS,’ this process is *not implemented by the mobile terminal*.” *Id.* at 28 (bold emphasis omitted).

First, Patent Owner attempts to individually distinguish Camp and Kingdon, rather than address Petitioners’ contentions regarding the combined teachings of the references. PO Resp. 27–29. Each reference must be read, not in isolation, but for what it fairly teaches in combination with the prior art as a whole. *See In re Keller*, 642 F.2d 413, 425 (CCPA 1981) (“The test for obviousness is not . . . that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is

what the combined teachings of the references would have suggested to those of ordinary skill in the art.”). In *KSR*, the Supreme Court criticized a rigid approach to determining obviousness based on the disclosures of individual prior art references, with little recourse to the knowledge, creativity, and common sense that a skilled artisan would have brought to bear when considering combinations or modifications. *See KSR*, 550 U.S. at 415–422; *see also Randall Mfg. v. Rea*, 733 F.3d 1355, 1362 (Fed. Cir. 2013). Patent Owner states that the combination of the references fails to disclose the limitation, but provides no explanation why. PO Resp. 26–28. Patent Owner’s distinctions are based on each individual reference and fail to address Petitioners’ contention regarding the combined teachings of the references. *Id.* at 26–28.

Moreover, Patent Owner’s arguments are premised on a faulty claim construction and an improper attempt to read an embodiment from the specification into the claim. Patent Owner asserts that Camp does not disclose a user or positioning application “selecting” a QoS value and that “in Camp there is no user or positioning-application selectable input.” *Id.* at 27. However, as explained in the claim construction section above, Patent Owner’s proposal to limit “determining a desired quality of service” to “ascertaining a quality of service associated with a computed position estimate as a function of *any user- or position application-selectable input* related to quality of service” unreasonably limits the claim to one embodiment in the specification. *See supra* Section II.C. The disputed limitation merely recites “determining a desired quality of service” without specifying that a user or application select an input. Although one embodiment in the ’815 patent specification is providing a user with the

ability to select from a number of options, claim 1 is not specific to that embodiment. Indeed, as explained above, claim 1 at least encompasses the subject matter of dependent claims 8, 9, and 10, and only claim 10 is directed to prompting a user to input the desired quality of service. And, claim 10 is not limited to a “selectable input.”

In addition, Patent Owner’s argument that, in Kingdon, any determining of a quality of service is not implemented by the mobile terminal is not persuasive. First, as explained above, Camp discloses the mobile terminal itself using a quality of service parameter—an age limit for the stored ephemeris data (e.g., four hours). Ex. 1023, Fig. 2, 6:3–7, 9:19–21, 9:24–27. And Camp discloses an application indicating a desired quality of service. Ex. 1025, 5:2–4, 6:4–7, 6:16–21. As explained in the claim construction section above, “determining a desired quality of service” encompasses a mobile terminal receiving a desired quality of service from an application. *See supra* Section II.C. Patent Owner’s claim construction argument that the desired QoS is not sent from the cellular network to the mobile terminal is unreasonably narrow in light of express disclosures in the ’815 patent specification that determining a desired quality of service includes receiving a specified quality of service from an application external to the mobile terminal. *See id.*

Thus, even Patent Owner’s distinctions of Kingdon and Camp individually are based on an unreasonably narrow reading of “determining a desired quality of service.” Accordingly, for the above reasons, we determine that Petitioners have shown that the combination of Camp and Kingdon teaches “determining a desired quality of service,” as recited in claim 1.

*iv. Determining whether aiding data stored
in said mobile terminal is sufficient*

Claim 1 of the '815 patent next recites “determining whether aiding data stored in said mobile terminal is sufficient to compute an estimate of said current position meeting said desired quality of service.” Petitioners contend that either Camp alone or Camp as modified by Kingdon discloses this limitation. Pet. 39–40 (citing, e.g., Ex. 1023, 9:24–27, 18:7–8; Ex. 1054 ¶¶ 209–211). We agree with Petitioners’ analysis and adopt it as our own. Camp discloses testing whether orbital data and clock correction data retained at the user terminal is “sufficiently current” to be used for the location process. Ex. 1023, 6:3–7. Specifically, as Petitioners contend, Camp discloses determining “if the orbital ephemeris data and clock correction data for the satellites in view, which have been stored in the user terminal 10 from a prior communication, are less than four (4) hours old.” *Id.* at 9:24–27; *see also id.* at Fig. 2. Also, Petitioners persuasively show that Camp teaches ascertaining whether the stored aiding data is sufficient to obtain a rapid location fix. Pet. 40 (citing Ex. 1023, 18:7–8; Ex. 1054 ¶ 210). We also agree that Kingdon discloses determining whether a positioning satisfying a desired quality of service can be performed. Ex. 1025, 9:17–19.

Patent Owner does not challenge Petitioners’ contention that Camp alone or the combination of Camp and Kingdon discloses “determining whether aiding data stored in said mobile terminal is sufficient to compute an estimate of said current position meeting said desired quality of service,” other than arguing that, because Camp and Kingdon fail to teach a mobile terminal determining a desired quality of service, Camp and Kingdon necessarily fail to teach this limitation. PO Resp. 28.

Because we agree with Petitioners’ analysis of the evidence, as discussed above, we determine that Petitioners have shown that Camp alone or Camp as modified by Kingdon discloses “determining whether aiding data stored in said mobile terminal is sufficient to compute an estimate of said current position meeting said desired quality of service.”

v. Obtaining additional aiding data

Claim 1 next recites “obtaining additional aiding data from a remote source if said stored aiding data is insufficient to compute said estimate of said current position meeting said desired quality of service.” Petitioners contend that the combination of Camp and Kingdon discloses this limitation. Pet. 40–42 (citing, e.g., Ex. 1023, 6:3–9, 8:27–9:3, 9:27–10:2; Ex. 1054 ¶¶ 212–217). We agree with Petitioners’ analysis and adopt it as our own. As Petitioners argue, Camp discloses receiving additional aiding data (e.g., current ephemeris data) from a remote source (e.g., an auxiliary communications system) if the aiding data stored in the mobile terminal is not less than four hours old. See Pet. 41; Ex. 1023, Figs. 1, 2, 8:27–9:3, 9:27–10:2; Ex. 1054 ¶¶ 213–214, 216. We also are persuaded by Petitioners’ evidence that while Camp does not explicitly disclose obtaining additional data pursuant to a determination that a desired quality of service cannot be met, it would have been obvious for an ordinarily skilled artisan to have done so in view of Kingdon, which teaches determining whether a desired quality of service can be achieved. See Pet. 41; Ex. 1025, Fig. 4, 9:14–22; Ex. 1054 ¶¶ 211, 215. As Petitioners assert, Camp teaches that if the orbital and clock correction data is not sufficiently current, then the user terminal requests a central server via a communications link for more current data. Ex. 1023, 6:3–9.

Patent Owner argues that Camp and Kingdon together do not teach “obtaining additional aiding data from a remote source if said stored aiding data is insufficient to compute said estimate of said current position meeting said desired quality of service” for two reasons. PO Resp. 28–29. First, Patent Owner argues that because Camp and Kingdon fail to teach a mobile terminal determining a desired quality of service, Camp and Kingdon necessarily fail to teach this limitation. PO Resp. 28. For the reasons discussed above in connection with the “determining a desired quality of service” step, this argument lacks merit. Patent Owner also asserts that Kingdon explicitly teaches away from the claim limitation because if the requested quality of service cannot be met, a failure message is sent. *Id.* at 29 (citing Ex. 1025, 9:14–22; Ex. 2005 ¶ 93). We do not agree with Patent Owner that Kingdon teaches away from Petitioners’ proposed combination. Kingdon discloses that a positioning request will not be performed if the requested quality of service cannot be met, but Kingdon does not criticize, discredit, or otherwise discourage obtaining additional aiding data instead. *See In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004).

Because we agree with Petitioners’ analysis of the evidence, as discussed above, we determine that Petitioners have shown that the combination of Camp and Kingdon teaches “obtaining additional aiding data from a remote source if said stored aiding data is insufficient to compute said estimate of said current position meeting said desired quality of service.”

vi. Motivation to combine

We also determine that Petitioners, with support of Dr. Goldberg, provide persuasive articulated reasoning with rational underpinning for its

proposed combination to support the legal conclusion of obviousness. Pet. 31–36 (citing, e.g., Ex. 1054 ¶¶ 189–198); *see KSR*, 550 U.S. at 418. Petitioners persuasively show that an ordinarily skilled artisan would have been motivated to modify Camp’s initiation of the on-demand positioning process to include the requesting application specifying a desired quality of services as taught in Kingdon to allow estimating the position of the mobile terminal using older or newer ephemeris data as desired. Pet. 35–36. As Petitioners explain, and as disclosed in Kingdon, a desired quality of service may vary depending on the application. Pet. 36; Ex. 1025, 8:28–13; *see also* Ex. 1054 ¶¶ 195–198. Petitioners also contend, and we agree, that both Camp and Kingdon teach a mobile device obtaining location-related data over a network while seeking to minimize the associated cost and network usage and the time it takes to calculate the device’s location. Pet. 31–33 (citing Ex. 1023, 3:23–4:4, 4:7–19, 6:3–9, 7:21–23, 9:24–10:2; Ex. 1025, Abstract, 3:6–8, 6:4–7, 9:9–13; Ex. 1054 ¶¶ 189–191). Petitioners also persuasively contend Kingdon teaches—and a person of ordinary skill in the art would have recognized—that specifying a desired quality of service would have benefitted many applications requesting positioning information on a cell phone. *Id.* at 33 (citing, e.g., Ex. 1025, 2:23–31, 4:16–20, 7:26–9:13; Ex. 1023, 10:7–19; Ex. 1054 ¶¶ 192–194).

Patent Owner argues against the combination for three reasons: (1) a person of ordinary skill in the art would not have been motivated to include the quality of service of Kingdon in Camp to use ephemeris data older or newer than four hours; (2) Petitioners’ proposed modification would render Camp’s system inoperable for achieving its intended purpose; and (3) there

would have been no benefit in modifying Camp with Kingdon. PO Resp. 29–34. Each of these arguments lack merit.

First, Patent Owner asserts that an ordinarily skilled artisan would not have modified Camp’s system to allow it to use ephemeris data that is older than four hours “because doing so would render the location attempt effectively nonfunctional.” *Id.* at 29–30 (citing Ex. 2005 ¶¶ 94–96). Patent Owner also asserts that a skilled artisan would not have modified Camp’s system to use data that is newer than four hours old because ephemeris data in the range of zero to four hours old has substantially the same accuracy. *Id.* at 30–31 (citing Ex. 2005 ¶¶ 97, 98; Ex. 2002, 41:13–42:5). This argument lacks merit. First, Petitioners’ reasons for combining the teachings of Camp and Kingdon are not limited to changing the ephemeris age parameter. As Petitioners explain, Kingdon teaches the concept of using a desired quality of service, which can include accuracy, timeliness, network impact, or other factors. *See* Pet. 31–33; Ex. 1025, 6:16–21, 8:28–9:13. We are persuaded that a skilled artisan would have been motivated to use a desired quality of service as taught in Kingdon to determine whether the stored data is sufficient. Second, the cited declaration testimony of Mr. Blackburn that using data older than four hours renders the location attempt nonfunctional is inconsistent with the ’815 patent, which discloses an embodiment in which aged ephemeris data (data older than four hours) could still be used to “acquire and measure satellite signals and compute an approximate position which does not necessarily meet the final accuracy QoS.” Ex. 1001, 6:59–7:13; *see also* Pet. Reply 17–18.

Patent Owner also argues that if Camp is modified to include the requesting application specifying a quality of service, Camp would no longer

operate as autonomously as possible and would incur more service charges, and thus would be rendered inoperable or unsatisfactory for its intended purpose. PO Resp. 31–33. Patent Owner also asserts that such a modification would change the basic principle of autonomous operation of Camp—in which approximate locations and a single base station are used—to using at least three base stations as required by Kingdon to process the desired quality of service. *Id.* at 32–33. We do not agree with Patent Owner. First, as explained above, Petitioners argue that the teaching of Kingdon to use with Camp is the use of a desired quality of service. As disclosed in Kingdon, a desired quality of service may result in less requests for data and lower service charges. Ex. 1025, 6:17–21, 8:28–9:13; *see also* Pet. 33–34. Second, Patent Owner’s characterization of Kingdon is too narrow. *See* PO Resp. 31–33. Kingdon is not limited to using three base stations and associated timing advance values because it explicitly states that other positioning methods may be used. Ex. 1025, 10:7–9; *see also* Pet. Reply 12–14, 19; Pet. 34; Ex. 1057 ¶¶ 26–28. We thus do not agree that using a desired quality of service as taught by Kingdon renders Camp inoperable for its intended purpose. *See In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984).

Third, Patent Owner argues that the proposed modification of Camp offers no benefits for reducing the initial search time and a skilled artisan would have been discouraged from modifying Camp in the proposed manner. PO Resp. 34 (citing, e.g., Ex. 2005 ¶¶ 105–106). Patent Owner’s argument lacks merit. We agree with Petitioners that modifying Camp to allow a specification of quality of service requirements allows positioning applications to vary quality of service requirements and allows a savings of

network resources by permitting less frequent aiding data updates. Pet. Reply 19–20; *see also* Ex. 1057 ¶ 46; Pet. 33–34; Ex. 1054 ¶¶ 192–193; Ex. 1025, 6:17–21, 8:28–9:13.

For the above reasons, we determine that Petitioners provide persuasive articulated reasoning with rational underpinning for combining the teachings of Camp and Kingdon.

vii. Conclusion

Having reviewed the parties’ arguments and supporting evidence, for the reasons explained above, we determine that Petitioners have shown by a preponderance of the evidence that claim 1 is unpatentable under 35 U.S.C. § 103 as obvious in view of Camp and Kingdon.

b. Independent claim 17

Petitioners contend that Camp in combination with Kingdon discloses each limitation of claim 17. Pet. 46–48. With respect to the preamble (“a mobile terminal”) and the first limitation (that the mobile terminal include “a positioning receiver”), Petitioners contend, and we agree, that Camp discloses a user terminal such as a cellular phone with a positioning receiver that receives navigation messages from GPS satellites. Pet. 46–47 (citing Ex. 1023, 8:14–16, 8:20–23, 10:20–11:12; Ex. 1054 ¶¶ 238–241). Patent Owner does not challenge Petitioners’ contention that Camp discloses a mobile terminal comprising a position receiver.

Claim 17 also recites that the mobile terminal includes “a processor for computing current position based on navigation signals received by said positioning receiver.” Petitioners contend, and we agree, that Camp teaches this limitation in that the user terminal in Camp performs a variety of processes, as illustrated in Figure 2 of Camp, including calculating the

location of a user terminal based on data from GPS satellite signals and that the user terminal necessarily includes some form of processor for performing the claimed computation. Pet. 47 (citing Ex. 1023, 9:17–15:8; Ex. 1054 ¶¶ 242–244). Patent Owner does not challenge Petitioners’ contention that Camp discloses this limitation.

Claim 17 next recites “said processor programmed to” perform three functions that are either identical or nearly identical to those recited in claim 1: determine a desired quality of service for the computation of current position, determine whether aiding data stored in said mobile terminal is sufficient to compute an estimate of said current position meeting said desired quality of service, and obtain additional aiding data from a remote source external to the mobile terminal if said stored aiding data is insufficient to compute said estimate of said current position meeting said desired quality of service. *Compare* Ex. 1001, 8:29–40, *with id.* at 7:35–43. With respect to each of these three limitations, Petitioners rely on their analysis of the corresponding limitation in claim 1. Pet. 47–48. For the reasons set forth above in connection with claim 1, we determine that Petitioners have shown that Camp in combination with Kingdon discloses each of these limitations of claim 17.

For claim 17, Petitioners rely on the same motivation to combine arguments and evidence discussed above in connection with claim 1. Pet. 31–36. Patent Owner does not raise any separate arguments in connection with claim 17 different from those addressed above in connection with claim 1. For the reasons explained above, we are persuaded by Petitioners’ reasoning for combining Camp and Kingdon.

Accordingly, having reviewed the parties' arguments and supporting evidence, for the reasons explained above, we determine that Petitioners have shown by a preponderance of the evidence that claim 17 is unpatentable under 35 U.S.C. § 103 as obvious in view of Camp and Kingdon.

c. Dependent claims 2, 3, 8, 9, 11, 12, 15, 18, and 19

As explained below, Petitioners contend that Camp in combination with Kingdon discloses each limitation of dependent claims 2, 3, 8, 9, 11, 12, 15, 18, and 19. Petitioners rely on the same motivation to combine arguments and evidence discussed above in connection with claim 1. Pet. 31–36. Patent Owner does not raise any arguments specific to dependent claims 2, 3, 8, 9, 11, 12, 15, 18, and 19 or challenge Petitioners' contentions that Camp in combination with Kingdon discloses the limitations added by these dependent claims. *See generally* PO Resp.

i. Claim 2

Claim 2 recites “[t]he method of claim 1 wherein obtaining additional aiding data from a remote source comprises obtaining additional aiding data from a mobile communication network.” Petitioners contend that Camp discloses the additional limitation of claim 2. Pet. 42 (citing, e.g., 1023, 8:27–9:3, 9:27–10:2; Ex. 1054 ¶¶ 216, 218–220).

We agree with and adopt Petitioners' analysis, *see* Pet. 42, and determine that Petitioners have shown by a preponderance of the evidence that claim 2 is unpatentable under 35 U.S.C. § 103 as obvious in view of Camp and Kingdon.

ii. Claim 3

Claim 3 recites “[t]he method of claim 1 wherein obtaining additional aiding data from a remote source comprises obtaining additional aiding data from at least one satellite.” Petitioners contend that Camp discloses the additional limitation of claim 3. Pet. 42–43 (citing, e.g., 1023, 8:14–18; Ex. 1054 ¶¶ 221–223).

We agree with and adopt Petitioners’ analysis, *see* Pet. 42–43, and determine that Petitioners have shown by a preponderance of the evidence that claim 3 is unpatentable under 35 U.S.C. § 103 as obvious in view of Camp and Kingdon.

iii. Claim 8

Claim 8 recites “[t]he method of claim 1 wherein determining a desired quality of service comprises receiving a specified quality of service from a requesting application.” Petitioners contend that Camp in combination with Kingdon discloses the additional limitation of claim 8. Pet. 43 (citing, e.g., Ex. 1054 ¶¶ 224–226); *see also* Ex. 1054 ¶ 224 (citing Ex. 1025, Abstract, 4:13–24; Ex. 1023, 6:3–9).

We agree with and adopt Petitioners’ analysis, *see* Pet. 43, and determine that Petitioners have shown by a preponderance of the evidence that claim 8 is unpatentable under 35 U.S.C. § 103 as obvious in view of Camp and Kingdon.

iv. Claim 9

Claim 9 recites “[t]he method of claim 1 wherein determining a desired quality of service comprises determining a default setting for said desired quality of service.” Petitioners contend that Camp in combination

with Kingdon discloses the additional limitation of claim 9. Pet. 43–44 (citing, e.g., Ex. 1023, 9:25–29; Ex. 1054 ¶¶ 227–229).

We agree with and adopt Petitioners’ analysis, *see* Pet. 43–44, and determine that Petitioners have shown by a preponderance of the evidence that claim 9 is unpatentable under 35 U.S.C. § 103 as obvious in view of Camp and Kingdon.

v. Claim 11

Claim 11 recites “[t]he method of claim 1 further comprising computing said current position of said mobile terminal.” Petitioners contend that Camp discloses the additional limitation of claim 11. Pet. 44–45 (citing, e.g., Ex. 1023, Fig. 2, 4:6–7; Ex. 1054 ¶¶ 230–231).

We agree with and adopt Petitioners’ analysis, *see* Pet. 44–45, and determine that Petitioners have shown by a preponderance of the evidence that claim 11 is unpatentable under 35 U.S.C. § 103 as obvious in view of Camp and Kingdon.

vi. Claim 12

Claim 12 recites “[t]he method of claim 11 wherein computing said current position of said mobile terminal comprises computing said current position of said mobile terminal based on said stored aiding data.” Petitioners contend that Camp discloses the additional limitation of claim 12. Pet. 45 (citing, e.g., Ex. 1023, Fig. 2, 9:17–10:19; Ex. 1054 ¶¶ 232–233).

We agree with and adopt Petitioners’ analysis, *see* Pet. 45, and determine that Petitioners have shown by a preponderance of the evidence that claim 12 is unpatentable under 35 U.S.C. § 103 as obvious in view of Camp and Kingdon.

vii. Claim 15

Claim 15 recites “[t]he method of claim 11 wherein computing said current position of said mobile terminal comprises computing said current position based on said additional aiding data obtained from said remote source.” Petitioners contend that Camp discloses the additional limitation of claim 15. Pet. 45–46 (citing, e.g., Ex. 1023, 8:27–9:3, 9:17–10:19; Ex. 1054 ¶¶ 234–236).

We agree with and adopt Petitioners’ analysis, *see* Pet. 45–46 (referring to Petitioners’ analysis of claims 1, 2, 3, and 11), and determine that Petitioners have shown by a preponderance of the evidence that claim 15 is unpatentable under 35 U.S.C. § 103 as obvious in view of Camp and Kingdon.

viii. Claim 18

Claim 18 recites “[t]he mobile terminal of claim 17 wherein the remote source is a network.” Petitioners contend that Camp discloses the additional limitation of claim 18. Pet. 48 (citing, e.g., Ex. 1054 ¶ 249).

We agree with and adopt Petitioners’ analysis, *see* Pet. 48 (referring to Petitioners’ analysis of claim 2), and determine that Petitioners have shown by a preponderance of the evidence that claim 18 is unpatentable under 35 U.S.C. § 103 as obvious in view of Camp and Kingdon.

ix. Claim 19

Claim 19 recites “[t]he mobile terminal of claim 17 wherein the remote source is a satellite.” Petitioners contend that Camp discloses the additional limitation of claim 19. Pet. 48 (citing, e.g., Ex. 1054 ¶ 250).

We agree with and adopt Petitioners’ analysis, *see* Pet. 48 (referring to Petitioners’ analysis of claim 3), and determine that Petitioners have shown

by a preponderance of the evidence that claim 19 is unpatentable under 35 U.S.C. § 103 as obvious in view of Camp and Kingdon.

E. Asserted Obviousness over Camp, Kingdon, and Gilbert (Claim 10)

Petitioners contend that claim 10 of the '815 patent is unpatentable under 35 U.S.C. § 103(a) as obvious over Camp, Kingdon, and Gilbert. Pet. 3, 48–54. Petitioners cite to the prior art references and rely on declaration testimony of Dr. Goldberg. *Id.* at 48–54 (citing Ex. 1054). Furthermore, Petitioners provide analysis purportedly explaining how the combination would have conveyed to one of ordinary skill in the art the claim limitations and provide reasons why one of ordinary skill in the art would have combined the teachings of the references. *Id.*

With support of the declaration of Mr. Blackburn (Ex. 2005), Patent Owner challenges Petitioners' contentions, arguing that a person of ordinary skill in the art would not have been motivated to combine the references in the manner proposed by Petitioner. PO Resp. 34–36. In reply, Petitioners maintain their position that claim 10 would have been obvious in view of the teachings of Camp, Kingdon, and Gilbert. Pet. Reply 20–21.

We have reviewed the Petition, Patent Owner's Response, and Petitioner's Reply, as well as the relevant evidence discussed in those papers. For the reasons that follow, we determine that Petitioners have shown by a preponderance of the evidence the subject matter of claim 10 would have been obvious in view of Camp, Kingdon, and Gilbert.

1. Summary of Gilbert

Gilbert is a U.S. patent titled "User Interface for Global Positioning System Receiver." Ex. 1022, [54]. Gilbert issued April 23, 2002 from an application filed February 12, 1999, and is prior art under 35 U.S.C. § 102(e)

to the '815 patent, which issued March 18, 2003 from an application filed December 22, 2000. *Compare* Ex. 1022, [22], *with* Ex. 1001, [22].

Gilbert discloses a GPS receiver that has a user interface for allowing a user to “specify[] a desired quality of position estimate to be provided by the receiver.” Ex. 1022, 2:36–47, 3:59–62; *see also id.* at Abstract. Figure 1A of Gilbert, shown below, illustrates the components of GPS receiver 10 having user interface 22:

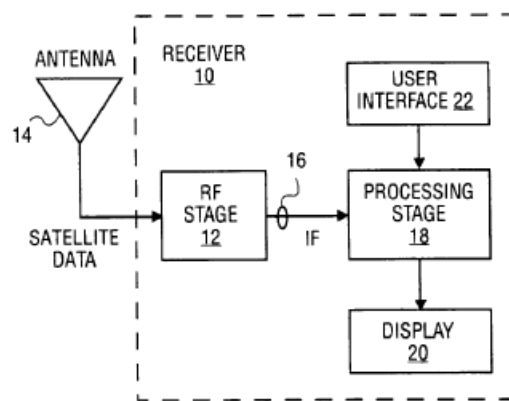


FIG. 1A

Id. at 3:1–3. As shown in Figure 1A above, GPS receiver 10 includes RF stage 12 which receives satellite data signals collected by antenna 14. *Id.* at 3:47–48. RF stage 12 produces intermediate frequency signals 16, which are provided to processing stage 18. *Id.* at 3:50–53. According to Gilbert, processing stage 18 operates on IF signals 16 to determine the position of receiver 10, and relies in part on user input received from user interface 22. *Id.* at 3:59–65.

Gilbert discloses that “user interface 22 provides means for setting parameters of receiver 10, those parameters specifying a qualitative or quantitative value such as desired quality of the position estimate [or] speed of acquisition.” *Id.* at 4:27–31. Gilbert also discloses that the user

application will dictate optimal performance. For example, according to Gilbert, “[i]n some instances a user requires fast acquisition of the signals needed to compute location. At other times, acquisition time is not as important as the accuracy or level of precision of the location determined.” *Id.* at 4:16–20. Gilbert discloses that the user interface may come in various forms, such as a slide bar control. *Id.* at Figs. 6, 7, 2:48–52, 3:30–42, 5:15–54. Figure 7, shown below, illustrates a slide bar control interface:

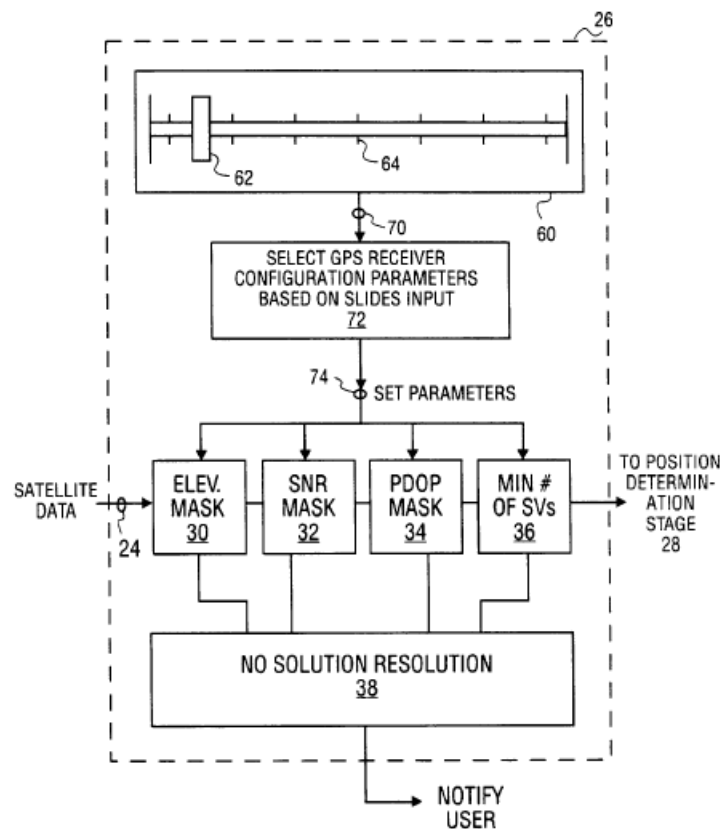


FIG. 7

Figure 7 of Gilbert, above, illustrates “an exemplary configuration of a complete slide bar interface 26 which provides means for setting configuration parameters for GPS receiver 10 in response to user input which specifies a desired quality of position estimate to be provided by

receiver 10.” *Id.* at 8:30–34. Gilbert explains that “user input may be received using a slide bar control,” as shown in Figure 7, that “may allow the user to choose from a number of predetermined settings . . . , each corresponding to a set of GPS receiver configuration parameters.” *Id.* at 8:35–41.

2. Analysis

Claim 10 recites “[t]he method of claim 1 wherein determining a desired quality of service comprises: prompting a user to input said desired quality of service; and receiving input from said user indicating said desired quality of service.”

Petitioners contend that the combination of Camp, Kingdon, and Gilbert discloses the limitations added by claim 10. Pet. 53–54 (citing Ex. 1022, Abstract, 2:44–47, 2:54–57; Ex. 1054 ¶¶ 271–274); *see also id.* at 48–51 (describing Gilbert). Specifically, Petitioners contend that Gilbert teaches presenting a user with a user interface configured to accept user input via a slider bar control interface, and that the user input accepted via the interface is a desired quality of service. *Id.* at 53–54 (citing, e.g., Ex. 1022, Abstract, 2:44–47, 2:54–57). Petitioners also articulate reasons why a person having ordinary skill in the art at the time of the invention would have been motivated to allow a user to input a desired quality of service in addition to or as an alternative to, for example, the requesting application specifying the desired quality of service. *Id.* at 51–53 (citing Ex. 1054 ¶¶ 262–270; Ex. 1022, 2:29–32, 2:44–47, 4:17–24; Ex. 1034, 15–16; Ex. 1020, 96).

Patent Owner argues that a skilled artisan would not have been motivated to combine Camp and Kingdon, as discussed above in connection

with claim 1, and further there would have been no motivation to combine Kingdon and Gilbert. PO Resp. 35. With respect to the latter, Patent Owner argues that Kingdon involves no GPS system and that Kingdon does not need to receive any data (e.g., ephemeris data) from GPS satellites, let alone process or filter any satellite data received. *Id.* Patent Owner argues that, in contrast, Gilbert's method is for an autonomous GPS receiver and applies user input to filter satellite data. *Id.* at 35–36. Patent Owner argues that modifying Kingdon with Gilbert would require substantial reconstruction and redesign of Kingdon and would change the principle of operation of Kingdon from a cellular network-based system to a GPS system. *Id.* at 36.

We determine that Petitioners have shown that the combination of Camp, Kingdon, and Gilbert teaches the limitations of claim 10. As explained above, we determine that Petitioners have shown that the combination of Camp and Kingdon discloses all of the limitations of claim 1, from which claim 10 depends. Moreover, we agree with Petitioners' analysis that Gilbert teaches prompting a user to input said desired quality of service and receiving input from said user indicating said desired quality of service. Pet. 53–54 (citing Ex. 1022, Abstract, 2:44–47, 2:54–57, Ex. 1054 ¶¶ 271–274); *see also id.* at 53–56 (describing Gilbert); Ex. 1022, Fig. 7, 2:36–47, 3:59–65, 4:16–20, 4:27–31, 8:30–41.

We also determine that Petitioners, with support of Dr. Goldberg, provide persuasive articulated reasoning with rational underpinning for its proposed combination to support the legal conclusion of obviousness. Pet. 51–53 (citing, e.g., Ex. 1054 ¶¶ 262–270); *see KSR*, 550 U.S. at 418. Petitioners contend, and we agree, that both Camp and Kingdon are directed to determining the location of a mobile terminal, that Camp is directed to

assisted GPS positioning, and that Gilbert is directed to a user interface implemented with a GPS receiver/device. *Id.* at 51. Petitioners also persuasively contend that a person of ordinary skill in the art would have been motivated to modify the combination of Camp and Kingdon to include a user interface taught by Gilbert to allow a user to input a desired quality of service in addition to or as an alternative to the requesting application specifying a desired quality of service. *Id.* at 51–52. We also agree with Petitioners that the combination of Camp, Kingdon, and Gilbert would implement quality of service for the same reasons—to allow control over desired accuracy, speed of GPS satellite acquisition, timeliness, and/or type of positioning application. *Id.* at 52 (citing 1054 ¶ 267). Petitioners further rely on Dr. Goldberg’s testimony that allowing a user to select a quality of service that directly affects the user experience (such as accuracy of a position estimate) would have been a natural and logical extension of application/mobile station-provided quality of service. *Id.* at 52 (citing Ex. 1054 ¶ 267). We credit and find persuasive the testimony of Dr. Goldberg, who provides sufficient explanation and factual corroboration to support his opinion.

Patent Owner’s arguments lack merit because they do not address the specific feature of Gilbert on which Petitioners rely—the user interface. *See* Pet. 51–54. Petitioners do not rely on Gilbert for its teaching of filtering satellite data. *Id.* Petitioners sufficiently explain why an ordinarily skilled artisan would have combined Gilbert’s teaching of *a user interface* to prompt a user to input a desired quality of service and to receive input from the user indicating a desired quality of service with the teachings of Camp and Kingdon. Pet. 51–53. Moreover, Patent Owner’s arguments are without

merit because a determination of obviousness based on teachings from multiple references does not require an actual, physical substitution of elements. *In re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012). Rather, the relevant inquiry is what the combined teachings of the references would have suggested to one having ordinary skill in the art. *Id.* at 1333.

Moreover, for the reasons explained above in connection with claim 1, we are persuaded by Petitioners' evidence and arguments that an ordinarily skilled artisan would have been motivated to combine Camp and Kingdon as asserted.

For these reasons, we determine that Petitioners have provided persuasive motivation for combining Gilbert's teaching of a user interface to prompt a user to input a desired quality of service and receiving that input with the teachings of Camp and Kingdon.

Accordingly, we determine that Petitioners have shown by a preponderance of the evidence the subject matter of claim 10 would have been obvious in view of the teachings of Camp, Kingdon, and Gilbert.

F. Asserted Obviousness over Camp, Kingdon, and Kurby (Claim 16)

Petitioners contend that claim 16 of the '815 patent is unpatentable under 35 U.S.C. § 103(a) as obvious over Camp, Kingdon, and Kurby. Pet. 3, 54–60. Petitioners cite to the prior art references and rely on declaration testimony of Dr. Goldberg. *Id.* at 54–60 (citing Ex. 1054). Furthermore, Petitioners provide analysis purportedly explaining how the combination would have conveyed to one of ordinary skill in the art the claim limitations and provide reasons why one of ordinary skill in the art would have combined the teachings of the references. *Id.*

With support of the declaration of Mr. Blackburn (Ex. 2005), Patent Owner challenges Petitioners' contentions, arguing that a person of ordinary skill in the art would not have been motivated to combine the references in the manner proposed by Petitioner. PO Resp. 37–39. In reply, Petitioners maintain their position that claim 16 would have been obvious in view of the teachings of Camp, Kingdon, and Kurby. Pet. Reply 26–27.

We have reviewed the Petition, Patent Owner's Response, and Petitioner's Reply, as well as the relevant evidence discussed in those papers. For reasons that follow, we determine that Petitioners have shown by a preponderance of the evidence the subject matter of claim 16 would have been obvious in view of the teachings of Camp, Kingdon, and Kurby.

1. Summary of Kurby

Kurby is a U.S. Patent titled "Method and Apparatus for a Global Positioning Data Service." Ex. 1027, [54]. Kurby issued December 7, 1999 and is prior art under 35 U.S.C. § 102(b) to the '815 patent, which issued from an application filed December 22, 2000. *Compare* Ex. 1027, [45], *with* Ex. 1001, [22]. Kurby discloses a subscriber unit in a GPS system that determines accurate location data without consuming battery power. Ex. 1027, Abstract, 2:49–54, 3:22–29.

Figure 1 of Kurby is shown below:

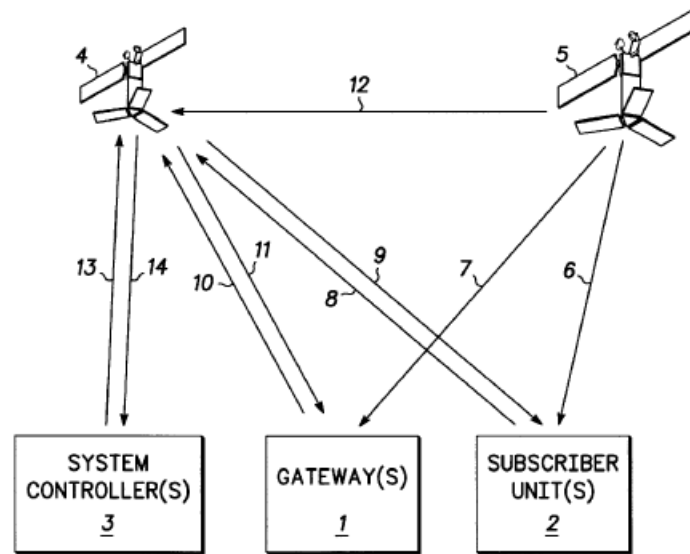


FIG. 1 ¹⁵

Figure 1 above illustrates a block diagram of a telecommunication system. *Id.* at 2:63–65. Kurby discloses that subscriber units 2 establish uplink 8 and downlink 9 with satellites 4 and establish link 6 to receive data from visible global positioning satellites 5. *Id.* at 4:20–23. According to Kurby, subscriber units 2 can obtain coarse estimates of their locations from information supplied on downlink 9 from satellites 4. *Id.* at 4:24–26. Kurby discloses that “subscriber units 2 also store their own current and past location data.” *Id.* at 4:26–28. Kurby also discloses that gateways 1 are equipped with GPS receivers and store and transmit almanac and ephemeris data for satellites 5. *Id.* at 4:43–46.

Figure 3 of Kurby illustrates a block diagram of a subscriber unit. *Id.* at 6:1–6. A subscriber unit includes a controller which “maintains records of the subscriber unit’s current location and update time, and records of coarse and accurate location data.” *Id.* at 7:1–3. Kurby discloses that a subscriber unit uses GPS to determine accurate location data. *Id.* at 7:12–16.

Figure 6 of Kurby is shown below:

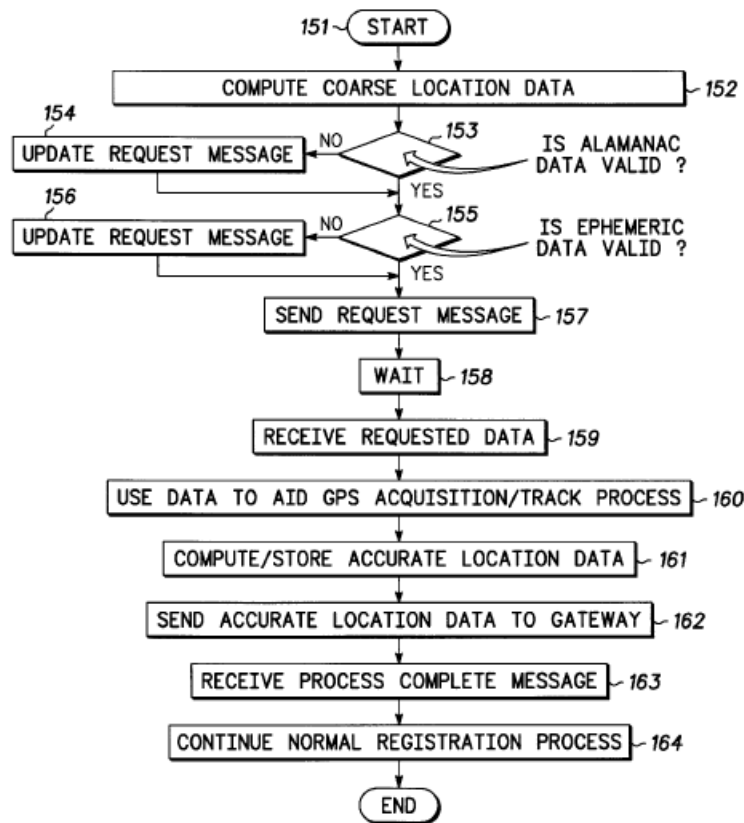


FIG. 6 150

Figure 6 above shows a flow chart of a global positioning data service procedure performed by a subscriber unit. *Id.* at 8:48–51. At step 152, the subscriber unit computes coarse location data. *Id.* at 8:57–60. Next, at step 153, the subscriber unit determines if it has valid GPS almanac data. *Id.* at 9:3–5. Kurby disclose that “[o]ne criteria for determining the validity of stored data is its age.” *Id.* at 9:5–6. Kurby discloses that a second criteria is location data. *Id.* at 9:7. According to Kurby, “[i]n this validity test, subscriber unit 2 (FIG. 1) determines if its current location is within a specified area with respect to its last stored location.” *Id.* at 9:7–10. If the subscriber unit determines the GPS almanac data is not valid, it updates a global positioning data service request in step 154, and proceeds to step 155.

Id. at 9:11–14. Kurby discloses that at step 155, the subscriber unit determines if it has valid ephemeris data, and if not, gets an update to the data. *Id.* at 9:15–20. Kurby describes the remaining steps of Figure 6 and states that even though subscriber units determine their current location on a regular schedule, they also can send location data messages to telecommunication system 15 when their current locations are outside of a particular threshold value with respect to their past location. *Id.* at 9:21–56.

2. Analysis

Claim 16 recites “[t]he method of claim 11 wherein computing said current position of said mobile terminal comprises computing said current position using a last known location of said mobile terminal.”

Petitioners contend that the combination of Camp, Kingdon, and Kurby discloses the limitation added by claim 16. Pet. 58–60 (citing Ex. 1027, 8:48–9:2; Ex. 1054 ¶¶ 289–297); *see also id.* at 54–56 (describing Kurby). Specifically, Petitioners contend that Kurby discloses using last stored location as a criterion for determining whether to obtain new aiding data for use in lieu of stored aiding data to acquire satellites and ultimately compute the current position of a subscriber terminal. *Id.* at 60. Petitioners also articulate reasons why a person having ordinary skill in the art at the time of the invention would have been motivated to combine Camp and Kingdon with Kurby. *Id.* at 56–58 (citing Ex. 1054 ¶¶ 286–288; Ex. 1023, 3:26–4:2, 6:3–9; Ex. 1027, Fig. 3, 9:5–10).

Patent Owner does not challenge Petitioners’ contention that Kurby discloses the limitation added by claim 16. *See* PO Resp. 37–39. Patent Owner argues that a skilled artisan would not have been motivated to combine Camp and Kingdon, as discussed above in connection with claim 1,

and further there would have been no motivation to combine Kingdon and Kurby. PO Resp. 37. With respect to the latter, Patent Owner argues that Kingdon involves no GPS system and that Kingdon does not need to receive any data (e.g., almanac data) from GPS satellites, let alone test satellite data stored for its validity. *Id.* Patent Owner also argues that modifying Kingdon to use the last known location of Kurby, which can be as old as one month and/or different from the current location by 310 to 621 miles would not serve the intended purpose of Kingdon, which is to support positioning requests from fast-moving subscribers and to provide quick response times. *Id.* at 38–39.

We determine that Petitioners have shown that the combination of Camp, Kingdon, and Kurby teaches the limitations of claim 16. As explained above, we determine that Petitioners have shown that the combination of Camp and Kingdon discloses all of the limitations of claims 1 and 11, from which claim 16 depends. Moreover, we agree with Petitioners’ analysis that Kurby teaches computing said current position of said mobile terminal comprises computing said current position using a last known location of said mobile terminal. Pet. 58–60 (citing Ex. 1027, 8:48–9:2, Ex. 1054 ¶¶ 289–297); *see also id.* at 54–56 (describing Kurby).

We also determine that Petitioners, with support of Dr. Goldberg, provide persuasive articulated reasoning with rational underpinning for its proposed combination to support the legal conclusion of obviousness. Pet. 56–58 (citing, e.g., Ex. 1054 ¶¶ 286–288); *see KSR*, 550 U.S. at 418. Petitioners contend, and we agree, that Camp, Kingdon, and Kurby are directed to positioning or location functionality in a mobile communications context and each explicitly recite the same or similar objectives of reducing

cost, time to achieve position fix, and/or reduce network resource usage. *Id.* at 56–57. Petitioners also persuasively contend that a person of ordinary skill in the art would have been motivated to modify the combination of Camp and Kingdon to use a last known location in computing a current position of a mobile terminal as additional criteria to determine whether aiding data is valid. *Id.* at 57–58.

Patent Owner’s arguments lack merit because they do not address the specific feature of Kurby on which Petitioners rely—using a last known location as part of the process of computing a current position taught by the combination of Camp and Kingdon. *See* Pet. 54–60. Patent Owner narrowly focuses on particular examples of Kingdon but fails to consider the teaching of Kingdon of providing a variety of preferences depending on the application. *See* Ex. 1057 ¶¶ 52–53; *see also* Ex. 1025, 6:16–21, 8:28–9:13; *see also* Pet. 33–34. Indeed, as Petitioners point out, Patent Owner mischaracterizes Kingdon in that Kingdon discloses that the fleet and taxi company would want to perform positioning on a “low priority basis.” Ex. 1025, 9:3–6. Moreover, Patent Owner’s arguments are without merit because a determination of obviousness based on teachings from multiple references does not require an actual, physical substitution of elements. *In re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012). Rather, the relevant inquiry is what the combined teachings of the references would have suggested to one having ordinary skill in the art. *Id.* at 1333. Moreover, for the reasons explained above in connection with claim 1, we are persuaded by Petitioners’ evidence and arguments that an ordinarily skilled artisan would have been motivated to combine Camp and Kingdon as asserted.

For these reasons, we determine that Petitioners have provided persuasive motivation for combining Kurby's teaching of using a last known location of a mobile terminal in computing a current position with the teachings of Camp and Kingdon.

Accordingly, we determine that Petitioners have shown by a preponderance of the evidence the subject matter of claim 16 would have been obvious in view of the teachings of Camp, Kingdon, and Kurby.

III. CONCLUSION

Based on the evidence and arguments, Petitioners have demonstrated by a preponderance of the evidence that (i) claims 1–3, 8, 9, 11, 12, 15, and 17–19 are unpatentable under 35 U.S.C. § 103(a) as obvious over Camp and Kingdon, (ii) claim 10 is unpatentable under 35 U.S.C. § 103(a) as obvious over Camp, Kingdon, and Gilbert, and (iii) claim 16 is unpatentable under 35 U.S.C. § 103(a) as obvious over Camp, Kingdon, and Kurby.

IV. ORDER

Accordingly, it is:

ORDERED that claims 1–3, 8–12, and 15–19 of U.S. Patent No. 6,535,815 have been shown to be unpatentable;

FURTHER ORDERED that, because this is a final written decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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Patent 6,535,815 B2

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