

**United States Court of Appeals  
for the Federal Circuit**

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**UBER TECHNOLOGIES, INC.,**  
*Appellant*

v.

**X ONE, INC.,**  
*Appellee*

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2019-1164

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Appeal from the United States Patent and Trademark Office, Patent Trial and Appeal Board in No. IPR2017-01255.

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Decided: May 5, 2020

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CHRISTOPHER DRYER, Fish & Richardson PC, Washington, DC, argued for appellant. Also represented by LAUREN ANN DEGNAN, MICHAEL JOHN BALLANCO, WALTER KARL RENNER.

DORIS JOHNSON HINES, Finnegan, Henderson, Farabow, Garrett & Dunner, LLP, Washington, DC, argued for appellee. Also represented by JEFFREY CURTISS TOTTEN; KEVIN D. RODKEY, Atlanta, GA; JACOB ADAM SCHROEDER, Palo Alto, CA.

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Before PROST, *Chief Judge*, DYK and WALLACH,  
*Circuit Judges*.

PROST, *Chief Judge*.

Uber Technologies, Inc. (“Uber”) appeals from a final written decision of the Patent Trial and Appeal Board (“Board”) finding claims 1, 2, 5, 6, 9, and 19 of U.S. Patent No. 8,798,593 (“the ’593 patent”) not unpatentable as obvious. *Uber Techs., Inc. v. X One, Inc.*, No. IPR2017-01255, Paper No. 41 (PTAB Oct. 12, 2018) (“*Final Written Decision*”). The Board’s conclusion was based on its determination that the asserted prior art does not render obvious the limitation “software . . . to transmit the map with plotted locations to the first individual.” Because the Board’s decision incorrectly applied the relevant legal principles, we reverse the Board’s non-obviousness determination as to this limitation, and remand for the Board to analyze the remaining limitations of the challenged claims in the first instance.

## I

X One, Inc. (“X One”) owns the ’593 patent, which is generally directed towards exchanging location information between mobile devices. The ’593 patent describes a “Buddy Watch application” that allows a mobile device user to add other mobile device users to her “Buddy List.” ’593 patent Abstract, col. 2 ll. 51–66. The user can share her location with her Buddies through the application and then press a “Mapit” button to see the locations of all of her buddies displayed on a map. *Id.* at col. 6 ll. 29–38, col. 9 ll. 39–57. Alternatively, a user may set up “instant buddies” on a temporary basis. *Id.* at col. 1 ll. 63–67; *see id.* at col. 3 ll. 20–25. For example, a stranded motorist may wish to be instant buddies with the driver of a tow truck, allowing each phone to “show the location of the other phone on its moving map. This allows the tow truck driver to find

the user tow truck customer and the user customer to know where the tow truck driver is.” *Id.* at col. 15 ll. 26–38. The purported novelty of the ’593 patent lies in this “two way position information sharing,” *id.* at col. 1 ll. 30–31, the creation of such location sharing “groups,” *id.* at col. 1 ll. 62–63, and “temporary location sharing” that “automatically expires,” *id.* at col. 1 ll. 63–66.

Claim 1, which is representative for the purposes of this appeal, recites:

1. An apparatus, comprising:

a server;

a database representing an account for a first individual, the account having an associated buddy list that identifies multiple users; and

software responsive to a request from the first individual to obtain a map, to obtain a last known position for multiple users identified by the buddy list, and to plot the last known location of at least two of the multiple users on the map, and *to transmit the map with plotted locations to the first individual;*

where the software is to request and store position information associated with cell phones of plural ones of the multiple users and where the software is to permit the first individual to change geography represented by the map and to transmit to the first individual a map representing the changed geography with plotted position of at least one of the multiple users, each in a manner not requiring concurrent voice communications; and

wherein the software to obtain the map is to obtain the map in a manner having a default geographic resolution.

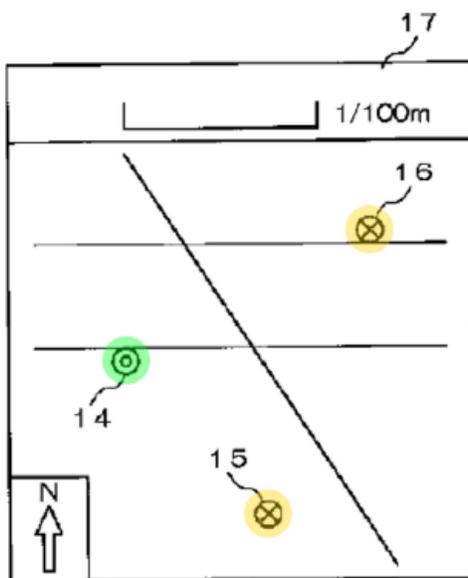
*Id.* at claim 1 (emphasis added).

Uber filed a petition for inter partes review asserting that claims 1, 2, 5, 9, and 19 of the '593 patent were obvious in view of Japanese Unexamined Patent Application Publication No. 2002-10321 ("Okubo") in combination with Japanese Unexamined Patent Application Publication No. 2002-352388 ("Konishi"). In a second ground, Uber also asserted that claims 1, 2, 5, 6, and 9 were obvious in view of Okubo, Konishi, and U.S. Patent No. 6,636,803 ("Hartz").<sup>1</sup>

Like the '593 patent, these pieces of prior art generally describe transmitting location information between mobile devices, including embodiments that can be used to show the locations of friends or vehicles. For example, Okubo describes a two-way "mobile terminal position information communication system" which "enable[s] acquisition of the position information for group members belonging to the same group." J.A. 1142 (English translation of Okubo). Mobile device users can form "groups" which allow each group member to see the locations of all other group members, and themselves, plotted on a map. J.A. 1142-43. Figure 3 depicts an exemplary plotted map that a user may see, showing the user's own location (14, annotated in green) as well as the locations of other group members (15 and 16, annotated in yellow):

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<sup>1</sup> Uber's petition included two additional grounds of obviousness based on Japanese Unexamined Patent Application Publication No. 2002-199433 ("Makoto"), alone or in combination with Hartz. However, Uber has elected not to appeal the Board's decision with respect to those grounds. Appellant's Br. 18 n.3.



Appellant's Br. 10 (annotating Okubo Fig. 3, J.A. 1145); see J.A. 1142, 1144.

Konishi discloses a “vehicle allocation system” in which a “customer” can reserve a vehicle using their “mobile telephone set.” J.A. 1214–16. When “a customer searches for available vehicles” (i.e., taxis for hire), the system plots “the current positions of the customer and available vehicles” on a map and “transmits the map to an information terminal of the customer.” J.A. 1214. Once the customer reserves a vehicle, the user’s map also shows the location of that reserved vehicle, in addition to the locations of the user and other available vehicles. J.A. 1214–15.

The Board instituted review but concluded in its final written decision that Uber had failed to demonstrate that independent claim 1 was unpatentable as obvious. The Board concluded that the combination of Okubo and Konishi failed to render obvious the claim limitation “software . . . to transmit the map with plotted locations to the first individual.” *Final Written Decision*, at 24. Because this limitation is also present in independent claim 19, and because all other challenged claims depend from independent

claim 1, the Board found all challenged claims not unpatentable. The Board reached the same conclusion with respect to the second obviousness ground consisting of Okubo, Konishi, and Hartz, as Uber did not rely on Hartz for any teachings related to this limitation. *Id.* Accordingly, the Board did not analyze the remaining limitations of claims 1 or 19, nor did it analyze the challenged dependent claims.

Uber timely appealed. We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(4)(A).

## II

“We review the Board’s factual findings for substantial evidence and review its legal conclusions de novo.” *In re Cuozzo Speed Techs., LLC*, 793 F.3d 1268, 1280 (Fed. Cir. 2015). The Board’s ultimate determination on obviousness is a legal determination that we review de novo, although we review any underlying factual findings for substantial evidence. *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015).

The parties’ dispute arises from the claim limitation “software responsive to a request from the first individual to obtain a map, to obtain a last known position for multiple users identified by the buddy list, and to plot the last known location of at least two of the multiple users on the map, *and to transmit the map with plotted locations to the first individual.*” ’593 patent claim 1 (emphasis added). This limitation requires a server to first plot certain known locations on a map, and then, only after plotting, to “transmit the map with plotted locations” to a user’s mobile device. It is undisputed that Konishi discloses such “server-side” plotting. Appellant’s Br. 2; Appellee’s Br. 19.

Okubo, in contrast, does *not* expressly disclose server-side plotting. Rather, as the Board found, Okubo discloses “terminal-side” plotting, wherein the user’s mobile device first receives a map and only then, on the mobile device,

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are the locations of other users plotted on the map. *Final Written Decision*, at 22.

In its final written decision, the Board concluded that the combination of Okubo's system and Konishi's server-side plotting does not render obvious the server-side plotting limitation of claim 1 because such a combination "represents impermissible hindsight," or would be a "wholesale modification to Okubo." *Id.* at 23. The Board also concluded that, because Okubo "sufficiently teaches the implementation of plotting the locations of group members on a map on its mobile terminal," it was "not persuaded by [Uber's] assertions that one of ordinary skill would seek out a design choice for combination with Okubo." *Id.*

On appeal, Uber argues that these conclusions were legal error. It argues that the Board misapplied the law of obviousness under *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398 (2007), because server-side plotting and terminal-side plotting were both well-known design choices in the prior art, and therefore it would have been obvious to substitute one for another. It also argues that the Board committed legal error by refusing to consider Okubo in combination with other prior art on the basis that Okubo was "successful" in and of itself.

#### A

The Supreme Court has "set forth an expansive and flexible approach" to "the question of obviousness" under 35 U.S.C. § 103. *KSR*, 550 U.S. at 415. The Court's discussion of design choices and predictable variations is instructive here.

When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a

technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.

*Id.* at 417. Moreover,

[w]hen there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. In that instance the fact that a combination was obvious to try might show that it was obvious under § 103.

*Id.* at 421.

As explained by Uber’s expert, and repeated in its petition, Okubo, Konishi, and the ’593 patent all attempt to solve the same problem—“helping one user view and track the location of other users.” J.A. 161, 1061. The ’593 patent itself identifies this same design need as existing in the field of mobile location tracking at the time of its invention. “One of the needs business, families, and individuals have is the need to know where their employees, children and friends are.” ’593 patent col. 1 ll. 27–29. According to Uber’s expert, Okubo “states that it addresses the problem of ‘enable[ing] recognition of the mutual current positions of multiple mobile terminals,” J.A. 1061 (quoting Okubo at Abstract), and Konishi addresses “the problem of enabling the recognition of the mutual current positions of multiple terminals in the context of a user ordering a taxi service, letting the user see and track the location of multiple taxi vehicles.” J.A. 1061 (citing Konishi at Abstract). Likewise, as the ’593 patent notes, “[i]t is useful to be able to share locations among multiple cell phones” and to “have a map

display on cell phones which are picture enabled and to plot the locations on the map of persons in a group.” ’593 patent col. 2 ll. 3–15.

The record reflects only two possible methods of achieving this: server-side plotting and terminal-side plotting. Both were undisputedly known in the prior art. As the Board found, Konishi expressly discloses server-side plotting and Okubo discloses terminal-side plotting. *Final Written Decision*, at 15–16; see J.A. 1144. And as Uber argues, a person of ordinary skill in the art would have recognized server-side plotting and terminal-side plotting as the two available methods for displaying a map with plotted locations. J.A. 2751–52; see J.A. 1068–69.<sup>2</sup> The parties have identified only these two methods of transmitting location information to a mobile device. See Appellant’s Br. 32; Appellee’s Br. 28; J.A. 2751–52; J.A. 2278–93. Accordingly, server-side plotting and terminal-side plotting represent “a finite number of identified, predictable solutions” to a design need that existed at the relevant time, which a person of ordinary skill in the art “ha[d] good reason to pursue.” *KSR*, 550 U.S. at 421.

Importantly, the alleged novelty of the ’593 patent is not related to the differences between server-side or terminal-side plotting. ’593 patent col. 1 ll. 30–31 (identifying purported novelty as “two way position information sharing”). The specification of the ’593 patent is entirely silent on how

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<sup>2</sup> Uber argued before the Board that Okubo teaches displaying a map on the user’s device, but is silent on whether plotting occurs server-side or terminal-side. The Board disagreed and found that Okubo discloses terminal-side plotting. While Uber disagrees with that finding, it argues that the Board’s legal conclusion of non-obviousness cannot stand even if we credit its findings related to Okubo, as Konishi teaches the claimed server-side plotting. Appellant’s Br. 27 n.5. As discussed above, we agree.

to transmit user locations and maps from a server to a user's mobile device, suggesting that a person of ordinary skill in the art was more than capable of selecting between the known methods of accomplishing this. The '593 patent confirms that its invention, including any necessary plotting, "utilizes existing platforms and infrastructure" and does not "require development of new cell phone or PDA technology, nor do[es it] require development of new cellular communication infrastructure." *Id.* at col. 2 ll. 44–50.

Accordingly, we hold that the Board erred when it determined that a person of ordinary skill in the art would not have been motivated to combine the teachings of Okubo with Konishi's server-side plotting to render obvious the limitation "software . . . to transmit the map with plotted locations to the first individual." This combination does not represent "impermissible hindsight" or "wholesale modification," as the Board found. *Final Written Decision*, at 22. Rather, because Okubo's terminal-side plotting and Konishi's server-side plotting were both well known in the art, and were the only two identified, predictable solutions for transmitting a map and plotting locations, it would have been obvious to substitute server-side plotting for terminal-side plotting in a combination of Okubo and Konishi. *See KSR*, 550 U.S. at 421. The combination of Okubo with Konishi's known server-side plotting is obvious because it would have been a "predictable variation" of Okubo's system as written, using a technique that was known to one of ordinary skill in the art. *Id.* at 417.

Our prior decision in *CRFD Research, Inc. v. Matal*, 876 F.3d 1330 (Fed. Cir. 2017), reinforces this conclusion. In that case, the claim in question required "transmitting a session history . . . *after* said session is discontinued." *Id.* at 1334 (emphasis added). The petitioner argued that this was one of only two possible solutions: either the session history was transmitted *after* the session is discontinued, or was transmitted *before* the session is discontinued, and a person of ordinary skill would have understood that prior

art systems could perform either. *Id.* at 1346. As here, the Board in *CRFD* found that while the claim required one solution (transmitting after discontinuation), a prior art reference taught only the other solution (transmitting before discontinuation). *Id.* at 1344–45. The Board concluded that the petitioner had “failed to provide a sufficient reason for why” a person of ordinary skill would be motivated to modify the prior art to implement the second solution. *Id.* at 1345 (internal quotation marks and citation omitted). We reversed, explaining that “a person of ordinary skill would have two predictable choices for when the [prior art] would transmit browser information, providing a person of ordinary skill with a simple design choice” between the two options. *Id.* at 1347 (citing *KSR*, 550 U.S. at 421).

The same is true here. The difference between server-side plotting and terminal-side plotting amounts to a design choice between whether to plot locations *before* transmitting location information (server-side plotting) or *after* transmitting location information (terminal-side plotting). A person of ordinary skill would therefore have two predictable choices for when to perform plotting, providing them with a simple design choice as to whether to plot server-side or terminal-side. *Id.* Because a person of ordinary skill “has good reasons to pursue the known options within his or her technical grasp,” § 103 bars the patentability of such obvious variations. *KSR*, 550 U.S. at 417, 421; *see also ACCO Brands Corp. v. Fellowes, Inc.*, 813 F.3d 1361, 1367 (Fed. Cir. 2016) (explaining that where an “ordinary artisan would . . . be left with two design choices . . . [e]ach of these two design choices is an obvious combination”); *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1238 (Fed. Cir. 2010) (holding that a motivation to combine and a reasonable expectation of success exist when “it is simply a matter of common sense” to combine known elements of the prior art to solve a known problem).

X One attempts to distinguish *CRFD* on the ground that the patent owner in that case “admitted that design choices were ‘equally likely’” while, here, the “proposed alteration would result in a ‘wholesale modification’ of Okubo.” Appellee’s Br. 38 (quoting *Final Written Decision*, at 23). We find this argument circular. The Board’s conclusion that the proposed combination would be a “wholesale modification” of Okubo was based on failure to recognize that, under *KSR*, server-side and terminal-side plotting are two known, finite, predictable, solutions for solving the same problem. Conclusions based on that legal error cannot undermine our correct application of *KSR* and *CRFD*. Even if the two proposed solutions would have required different implementation, that does not negate the fact that server-side and terminal-side plotting are two known, finite, predictable solutions for solving the same problem which, consistent with precedent, renders obvious the challenged limitation.

We are also not persuaded by X One’s technical arguments attempting to distinguish the systems of Okubo and Konishi. X One argues that Okubo uses a “low-data-rate differential GPS (DGPS) system” while Konishi uses a “cellular” network. Appellee’s Br. 2. As an initial matter, X One wrongly asserts that the Board agreed with or adopted these factual contentions. It did not. The Board merely included this argument in its recitation of X One’s contentions. J.A. 18. It is not clear from the record that Okubo is necessarily limited to DGPS systems, as X One contends. For example, Uber’s expert testified that the “mobile terminals” used in Okubo “could be cell phones.” J.A. 1070. And X One’s expert testified that DGPS systems were not ordinarily capable of “two-way communication,” despite X One’s contention that Okubo disclosed a two-way communication system. J.A. 2915.

Ultimately, however, it does not matter whether Okubo teaches cellular transmission or merely DGPS transmission, because Konishi undisputedly discloses a cellular

network. “[I]t is not necessary that [two pieces of prior art] be physically combinable to render obvious” the asserted patent. *Allied Erecting and Dismantling Co., Inc. v. Genesis Attachments, LLC*, 825 F.3d 1373, 1381 (Fed. Cir. 2016) (quoting *In re Sneed*, 710 F.2d 1544, 1550 (Fed. Cir. 1983)). Rather, the question is “whether the claimed inventions are rendered obvious by the teachings of the prior art as a whole.” *In re Etter*, 756 F.2d 852, 859 (Fed. Cir. 1985) (noting that whether one prior art reference can be incorporated into another is “basically irrelevant.”) In evaluating the combination of Okubo and Konishi, the prior art undisputedly discloses cellular networks. The precise breadth of Okubo’s teachings on their own, whatever it may be, does not alter our conclusion that, viewing the prior art as a whole, server-side plotting and terminal-side plotting were two known, finite, predictable solutions for achieving the transmission of maps and plotted locations, including by cellular networks.

Accordingly, we find that the Board erred in determining that the combination of Okubo and Konishi does not render obvious the limitation “software . . . to transmit the map with plotted locations to the first individual.” Because terminal-side plotting (as described in Okubo) and server-side plotting (as described in Konishi and claimed in the ’593 patent) would have been two of a finite number of known, predictable solutions at the time of the invention of the ’593 patent, a person of ordinary skill would have faced a simple design choice between the two, and therefore would have been motivated to combine the teachings of Okubo and Konishi to achieve the limitation.

## B

Because we conclude that the limitation is obvious for the reasons discussed above, we do not reach Uber’s alternative argument that the Board erred by failing to consider Okubo in light of other prior art because it was “successful” on its own.

### III

For the reasons stated above, we reverse the Board's determination as to the obviousness of the limitation "software . . . to transmit the map with plotted locations to the first individual" in view of Okubo and Konishi. We therefore remand for the Board to evaluate in the first instance the remaining limitations of the claims challenged in grounds 1 and 2 of Uber's petition.

### **REVERSED AND REMANDED**

#### COSTS

The parties shall bear their own costs.