

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BJ'S WHOLESALE CLUB HOLDINGS, INC.,
Petitioner,

v.

WALMART APOLLO, LLC,
Patent Owner.

IPR2022-01563
Patent 10,803,435 B2

Before PATRICK R. SCANLON, NEIL T. POWELL, and
MITCHELL G. WEATHERLY, *Administrative Patent Judges*.

POWELL, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

A. BACKGROUND

BJ's Wholesale Club Holdings, Inc. ("Petitioner") filed a Petition for *inter partes* review of claims 1–14 of U.S. Patent No. 10,803,435 B2 (Ex. 1001, "the '435 patent"). Paper 2 ("Pet."). Walmart Apollo, LLC ("Patent Owner") filed a Preliminary Response. Paper 8 ("Prelim. Resp."). Because Petitioner filed multiple other petitions challenging claims of the '435 patent, Petitioner also filed a Notice of Ranking Petitions for *Inter Partes* Review of U.S. Patent No. 10,803,435. Paper 7 ("Not."). With the Board's authorization, Petitioner filed a Reply to Patent Owner Preliminary Response (Paper 9, "Reply to Prelim. Resp."), and Patent Owner filed a Preliminary Sur-reply (Paper 10, "Prelim. Sur-reply").

Pursuant to 35 U.S.C. § 314, we instituted an *inter partes* review of claims 1–14 of the '435 patent on all presented challenges. Paper 11 ("Institution Decision" or "Inst. Dec."). After institution, Patent Owner filed a Response (Paper 22, "PO Resp."), to which Petitioner filed a Reply (Paper 27 "Pet. Reply"), and Patent Owner thereafter filed a Sur-reply (Paper 29 "PO Sur-reply").

Additionally, with our authorization, Petitioner filed a Motion to Submit Supplemental Information. Paper 16 ("Mot." or "Motion to Submit Supplemental Information"). Patent Owner filed a Notice explaining that it did not oppose Petitioner's Motion. Paper 17, 2. We granted Petitioner's Motion. Paper 18, 3.

A consolidated oral hearing for this proceeding, IPR2022-01528, and IPR2022-01564 was held on January 11, 2024. Paper 36 ("Tr.").

We have jurisdiction under 35 U.S.C. § 6. This Decision is a final written decision under 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons below, we determine that Petitioner has shown by a preponderance of the evidence that claims 1–14 of the ’435 patent are unpatentable.

B. RELATED PROCEEDINGS

The parties note that the ’435 patent is involved in *Sam’s West, Inc. v. BJ’s Wholesale Club Holdings, Inc.*, No. 6:22-cv-00587 (M.D. Fla. Mar. 22, 2022). Pet. 1; Paper 3, 1–2.

Additionally, the parties note that the ’435 patent has also been challenged in other petitions for *inter partes* review. Pet. 1; Paper 3, 1. Petitioner filed a petition challenging claims 15–19 of the ’435 patent in IPR2022-01528 (the “1528 IPR”). IPR2022-01528, Paper 2. In that proceeding, we instituted *inter partes* review. IPR2022-01528, Paper 11. Petitioner also filed a petition challenging claims 1–14 of the ’435 patent in IPR2022-01561 (the “1561 IPR”). Ex. 3002. In that proceeding, we denied institution of *inter partes* review. Ex. 3001 (“1561 institution decision”). Additionally, Petitioner filed a petition challenging claims 1–14 of the ’435 patent in IPR2022-01564 (the “1564 IPR”). IPR2022-01564, Paper 2. We instituted *inter partes* review in that proceeding, also. IPR2022-01564, Paper 9.

The parties also note that the ’435 patent is related to U.S. Patent No. 10,121,133 B2, the claims of which have been challenged in IPR2022-01471. Pet. 1; Paper 3, 1. The parties also note that the ’435 patent is related to pending U.S. Patent Application No. 17/004,819. Pet. 1; Paper 3, 1.

C. THE '435 PATENT

The '435 patent is titled “Method for Self-Checkout with a Mobile Device” and relates to methods, systems, and computer program products for purchasing an item using a mobile device. Ex. 1001, code (54), 1:53–2:31. Figures 2A and 2B are illustrative and reproduced below.

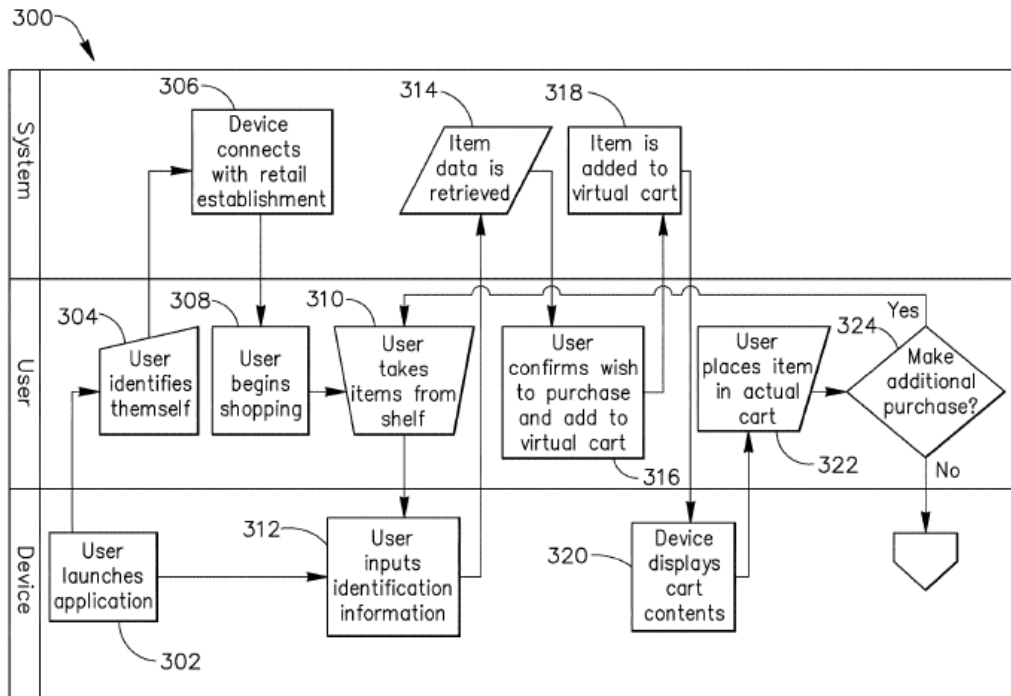


Fig.2A

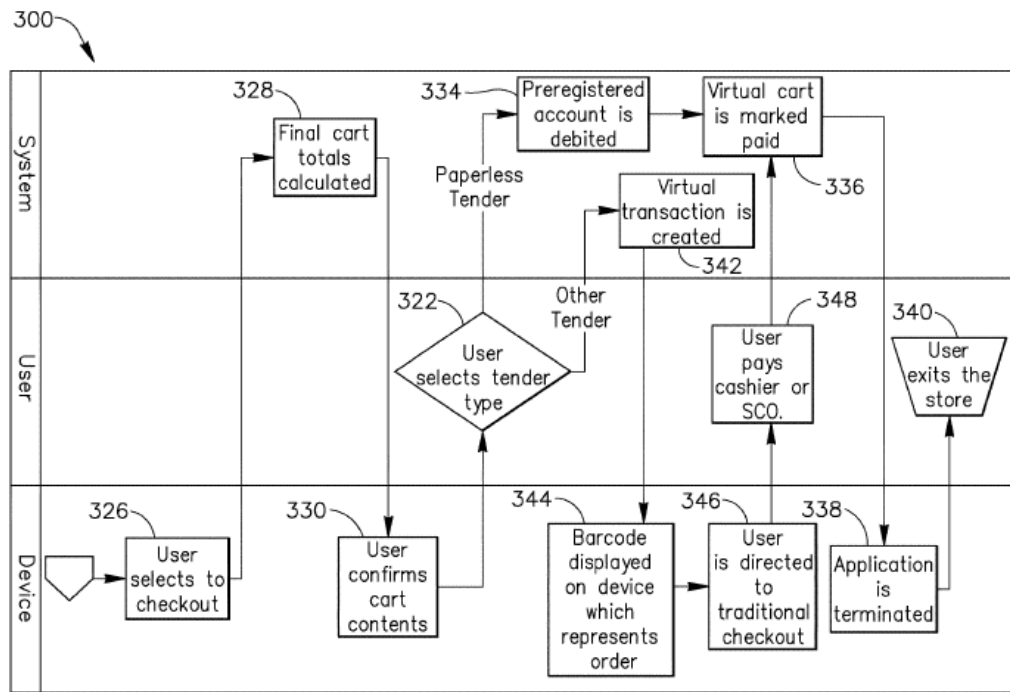


Fig.2B

Figures 2A and 2B of the '435 patent “depict flowchart illustrations of methods, apparatus (systems) and computer program products, in accordance with one embodiment.” *Id.* at 2:52–54, Figs 2A, 2B. As shown, Figures 2A and 2B depict method 300 including a series of steps for self-checkout with mobile device 200 that has been brought into a retail establishment. *Id.* at 5:58–61. For example, at block 302, mobile self-checkout application 400 may be launched within mobile device 200. *Id.* at 5:61–63. After identifying the user (block 304), mobile device 200 may be connected with remote server 240 at the retail establishment via network 226 (block 306). *Id.* at 6:15–18. The user may then begin to shop by walking around the retail establishment and looking for items 220 to purchase (block 308). *Id.* at 6:20–22. Within mobile application 400, home screen 402 may be presented to the user including begin shopping

button 406, which, upon selection, presents the user with shopping screen 418. *Id.* at 6:26–32, Figs. 3–4.

Figures 4 and 5 of the '435 patent are illustrative of shopping screen 418 and scan items screen 420, respectively, and are reproduced below.

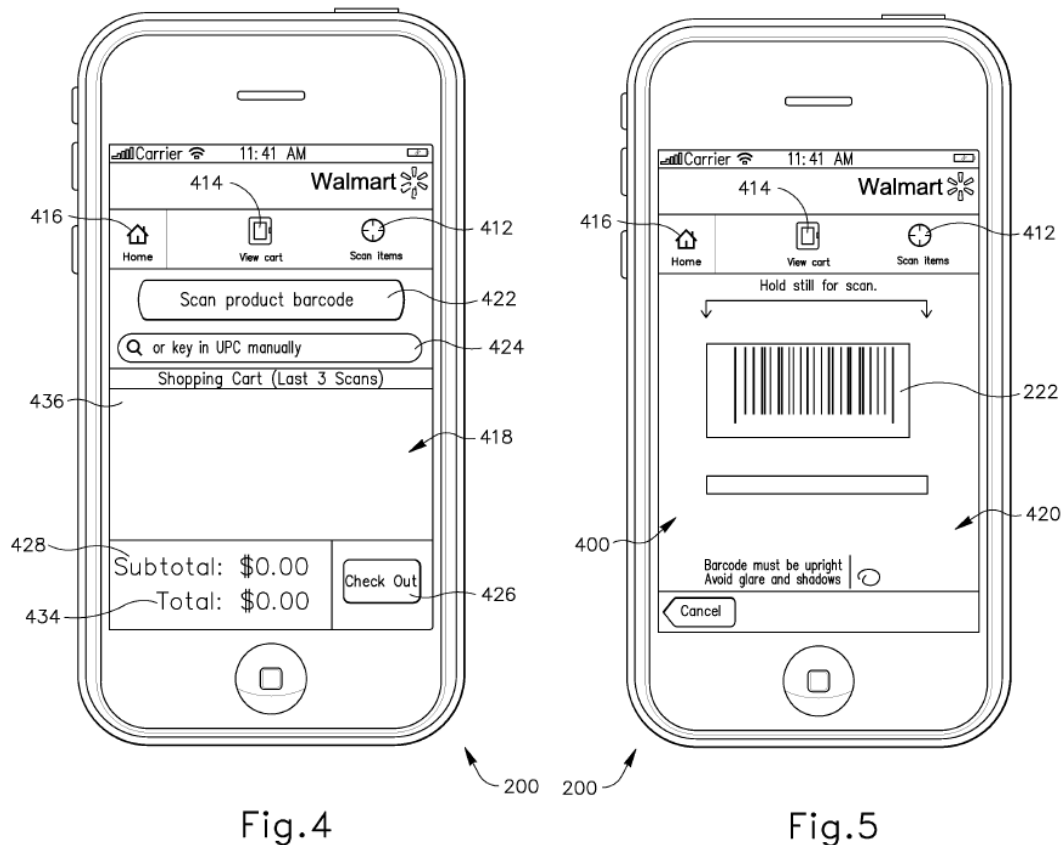


Figure 4 (left) of the '435 patent depicts shopping screen 418 on mobile self-checkout application 400 of mobile device 200, and Figure 5 (right) depicts scan items screen 420. Ex. 1001, 7:17–26. Returning to Figure 2A, upon spotting an item to purchase, the user removes item 220 from a shelf or stand within the retail establishment (block 310) and “inputs identification information 222 into the mobile device 200 which identifies the item 220 for purchase” (block 312). *Id.* at 7:48–53. For example, the user can press the shopping screen’s scan items button 412 or scan product code button 422

shown in Figure 4, either of which activates scanning module 202 and presents the user with scan items screen 420, as shown in Figure 5.

Id. at 7:59–64; *see also id.* at 7:23–26. “At scan items screen 420, the user initiates scanning module 202 which then receives identification information 222 from an item 220 and converts the identification information 222 into a format” readable and processable by processor 201, such as a digital image. *Id.* at 7:64–8:2; *see also id.* at 4:61–64. “Upon inputting identification information 222 into the mobile device 200, the identification information 222 is transmitted to the remote server 240 via communications device 208 and received by the remote server 240” (Fig. 2A, block 314), which retrieves item information 432 representing the item 220 using the identification information 222 received from the mobile device 200. Ex. 1001, 8:7–14; *see also id.* at 7:30–35. “[T]he remote server 240 may then transmit the retrieved item information 432 to the mobile device” for presentation to the user on item information screen 440. *Id.* at 8:20–22, Fig. 6. The user may then be prompted to confirm his or her intent to purchase the item 220 identified by item identification information 222, for example, with add to shopping cart button 442. *Id.* at 8:27–30, Figs. 2A (block 316), 6 (button 442).

“If the user confirms his/her intent to purchase item [220], a virtual shopping cart 433 containing item information 432 representing the item 220” may then be generated by mobile device 200 and transmitted to remote server 240 (Fig. 2A, block 318). Ex. 1001, 8:63–9:1. A user can view the contents of virtual shopping cart 433 on shopping cart screen 430 by selecting view cart button 414. *Id.* at 6:58–62, Fig. 8 (button 414, screen 430). A user can check out by selecting check out button 426 on the

display screen, in response to which the user is presented with checkout screen 450 comprising the total contents of virtual shopping cart 433 and an option to confirm the user's intent to purchase those contents.

Id. at 7:36–40, Figs. 2B (block 326), 4 (button 426), 9 (screen 450); *see also id.* at 10:25–56 (describing alternate check out button 439 and confirm button 454), Figs. 8 (button 439), 9 (button 454).

“Upon selecting the option to checkout, a total amount for all the contents of the virtual shopping cart 433 is calculated and an order 452 is generated for the item 220 identified by the identification information 222, listed in the virtual shopping cart 433.” Ex. 1001, 10:37–41, Fig. 2B, (block 328). “The user . . . has the choice of payment method, either transmitting payment via the mobile device 200 using mobile self-checkout application 400 or providing payment at either a traditional cashier or self-checkout station.” Ex. 1001, 10:67–11:4, Fig. 2B (blocks 322, 334, 342, 346, 348). “If the user decides to provide payment for order 452 using a traditional cashier or self-checkout station, . . . then a virtual transaction is created . . . and an optical machine-readable representation 460 of the order 452 . . . is generated and displayed on the display 206 of the mobile device 200.” *Id.* at 11:5–11, Fig. 2B (blocks 342, 344). According to the '435 patent, optical machine-readable representation 460 “encodes identifying information or a unique identifier 462” and “is encoded in such a manner as to allow an optical scanning machine 500, such as barcode reader, to read” it. *Id.* at 11:24–25, 11:40–43.

Figure 10 of the '435 patent is reproduced below.



Fig.10

Figure 10 of the '435 patent depicts one representation of the mobile device 200 running the mobile self-checkout application 400 during the checkout process. Ex. 1001, 2:55–58, 11:58–61. As shown, “upon generating the optical machine-readable representation 460 of the order 452,” mobile self-checkout application 400 generates machine-readable representation screen 458, which “includes an order number 463 along with the optical machine-readable representation 460 of the order 452, a total payment amount 464 for all the items 220 ordered, and a total amount 466 of items 220 sold.” *Id.* at 11:58–66. The user may present machine readable representation 460 to a cashier to scan, or go to “a self-checkout station and present[] the optical machine-readable

representation 460 to an optical scanning machine 500[,] which reads the optical machine-readable representation 460, and specifically the unique identifier 462.” *Id.* at 11:66–12:3, 12:12–18, Fig. 2B (block 346). The user is then prompted to tender payment by either the traditional cashier or the self-checkout station, whereupon the user can then tender total payment amount 464. *Id.* at 12:24–29, Fig. 2B (block 348).

Lastly, “an acknowledgment that payment has been received,” such as a digital receipt, “is sent to the mobile device 200 from the remote server 240 and displayed to the user.” Ex. 1001, 12:38–49.

D. ILLUSTRATIVE CLAIM

Of the challenged claims, claims 1 and 10 are independent. Each of claims 2–9, and 11–14 depends, directly or indirectly, from one of independent claims 1 and 10. Claim 1 is illustrative and is reproduced below with certain reformatting:¹

1. [1p] A method of converting a mobile phone into a mobile point-of-sale device, the method comprising:
 - [1a] executing a mobile self-checkout application on the mobile phone, the mobile self-checkout application allowing a user of the mobile phone to select items in a store and tender payment for the selected items via a user interface rendered by the mobile self-checkout application on a display of the mobile phone;
 - [1b] initiating a session between the mobile phone and a server, the session managed by a session manager;
 - [1c] rendering the user interface on a display of the mobile device by the mobile self-checkout application;

¹ We have added the same labels that Petitioner applies to different portions of claim 1. *See* Pet. 13–26.

- [1d] in response to selection of a scanning function via the user interface, activating an imaging device of the mobile phone to capture identification information associated with a physical object;
- [1e] activating a radio transmitter of the mobile phone to transmit the captured identification information associated with the physical object to the server executing a virtual terminal sales application;
- [1f] receiving, by the mobile phone, item information associated with the physical object from the server;
- [1g] generating, by the mobile phone, a virtual shopping cart to save the item information associated with the physical object;
- [1h] adding the item information of the physical object to the virtual shopping cart to maintain the order;
- [1i] receiving instructions via the user interface of the mobile self-checkout application to check out, receiving, by the server, payment information to complete a transaction for the order in response to selection of a checkout function via the user interface;
- [1j] completing, by the server, the transaction for the order based on the payment information; and
- [1k] transmitting, by the server, receipt information to the mobile phone in response to completion of payment for the order;
- [1l] rendering, by the mobile phone on the display, the receipt information in a machine-readable element; and
- [1m] optically scanning the machine-readable element rendered on the display of the mobile phone, by an optical scanning machine in communication with the server, to confirm completion of payment for the order.

Ex. 1001, 21:19–61.

E. EVIDENCE

Petitioner relies on the following evidence:

(1) Korean Patent Publication No. 10-2007-087811, published Aug. 29, 2007 (Ex. 1009, “Yong,” with translation at Exs. 1010, 1021).

(2) U.S. Patent Application Publication No. 2009/0094100 A1, published Apr. 9, 2009 (Ex. 1011, “Xavier”).

(3) Declaration of Michael I. Shamos, Ph.D. (Ex. 1002).

F. ASSERTED GROUND OF UNPATENTABILITY

Petitioner challenges the patentability of claims 1–14 of the ’435 patent on the following ground (Pet. 13–14):

Claims Challenged	35 U.S.C. §	References
1–14	103	Yong, Xavier

II. ANALYSIS

A. LEVEL OF ORDINARY SKILL

Petitioner contends that a person of ordinary skill in the art “would have had a Bachelor’s degree in computer science, computer engineering, electrical engineering, or a related field or equivalent coursework or experience, and one to two years of experience with mobile device applications and retail POS systems,” also noting that “[m]ore education can supplement practical experience and vice versa.” Pet. 10 (citing Ex. 1002 ¶ 33). “For purposes of the IPR proceedings related to the ’435 Patent only, [Patent Owner] does not dispute this definition.” PO Resp. 8.

For the purposes of this Decision, we apply Petitioner’s proffered level of skill in the art because it appears consistent with the problems addressed in the ’435 patent and the prior art.

B. DR. WILLIAMS’S RETAIL TECHNOLOGY KNOWLEDGE AND EXPERIENCE

Petitioner argues that Dr. Williams “has limited knowledge of retail technologies, [and he admits] that his only retail technology experience is limited to MBA case studies from the early 1990s.” Pet. Reply 3 (citing Ex. 1022, 15:20–22, 16:3–7, 17:22–23; Ex. 2010). Based on this, Petitioner advances that we “should afford little weight to Dr. Williams’ testimony.” *Id.*

Patent Owner counters that we should afford full weight to Dr. Williams’s testimony. PO Sur-reply 2. Patent Owner contends that Dr. Williams meets Petitioner’s definition of a person of ordinary skill in the art. *Id.* According to Patent Owner, “Dr. Williams surpasses the education requirement” and meets the experience requirements. *Id.* Addressing Petitioner’s concerns about retail technology experience, Patent Owner asserts that “Dr. Williams testified that his MBA curriculum contained coursework that included study of POS systems, particularly though case studies.” *Id.* at 3 (citing Ex. 2009 ¶ 3; Ex. 1022 16:3–7). “This is precisely the ‘more education in the [person of ordinary skill in the art] definition that can ‘supplement practical experience,’” Patent Owner argues. *Id.* (citing Pet. 12).

Patent Owner persuades us that Petitioner’s concerns regarding Dr. Williams’s retail technology and knowledge and experience are not a basis for affording less weight to Dr. Williams’s testimony.

C. CLAIM CONSTRUCTION

In an *inter partes* review proceeding, a claim of a patent is construed using the same standard used in federal district court, including construing

the claim in accordance with the ordinary and customary meaning of the claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent. 37 C.F.R. § 42.100(b) (2020). According to the applicable standard, claim terms “are generally given their ordinary and customary meaning” as understood by a person of ordinary skill in the art in question at the time of the invention. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc) (citations omitted). Only those terms that are in controversy need be construed, and only to the extent necessary to resolve the controversy. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (citing *Vivid Techs., Inc. v. America Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

In view of the parties’ patentability disputes, we observe one claim-construction subject warranting discussion. Specifically, the parties’ disputes warrant discussion of the claims’ repeated recitations of “the server.” *E.g.*, Pet. 17–26, 38–42; PO Resp. 5–6, 29–40; Pet. Reply 3–4; PO Sur-reply 5–15.

In the challenged claims, there are multiple recitations of “the server.” For example, independent claim 1 recites “the server” in limitations 1e, 1f, 1i, 1j, 1k, and 1m. Ex. 1001, 21:37, 21:40, 21:48, 21:51, 21:60. The parties agree that every recitation of “the server” in challenged claims 1, 3, 5, and 7 refers to the same server. PO Resp. 5–6; Pet. Reply 3–4. The parties also agree that every recitation of “the server” in challenged claims 10, 12, and 14 refers to the same server. PO Resp. 5–6; Pet. Reply 3–4.

We agree with the parties’ claim construction. Grammatically, within each of claims 1, 3, 5, and 7, each recitation of “the server” refers to the same “server.” Thus, according to these claims’ plain meaning, each and

every recitation of “the server” refers to the same server. *See Salazar v. AT&T Mobility LLC*, 64 F.4th 1311, 1315–16 (Fed. Cir. 2023) (explaining claim language reciting element with definite article refers to same element previously recited) (citing *Baldwin Graphic Sys., Inc. v. Siebert, Inc.*, 512 F.3d 1338, 1342–43 (Fed. Cir. 2008); *Harari v. Lee*, 655 F.3d 1331, 1341 (Fed. Cir. 2011)). Likewise, according to the plain meaning of claims 10, 12, and 14, each and every recitation of “the server” in these claims refers to the same server. We construe every recitation of “the server” in claims 1, 3, 5, and 7 as referring to the same server. And we construe every recitation of “the server” in claims 10, 12, and 14 as referring to the same server.

D. YONG TRANSLATION DISPUTE

In its Preliminary Response, Patent Owner alleged that Petitioner’s translation of Yong had certain flaws. Prelim. Resp. 24–30. Having fully considered those alleged flaws, we determined that the Petition had demonstrated a reasonable likelihood of prevailing on its patentability challenges based on Yong, and we instituted an *inter partes* review. Inst. Dec. 13–24.

As noted above, following institution of *inter partes* review, we granted Petitioner’s Motion to Submit Supplemental Information, which sought to enter supplemental information related to the translation of Yong. Mot. 1; Paper 18, 3. Given this, Petitioner entered certain additional exhibits related to the translation of Yong, specifically Exhibits 1027–1030 (“supplemental exhibits”).

At this stage, Petitioner has entered multiple exhibits containing translations of Yong. With the Petition, Petitioner entered (1) Exhibit 1010, which is a translation of Yong’s text, including the text of Yong’s drawings

(without the illustrations of Yong's drawings) and (2) Exhibit 1021, which includes the schematics of Yong's drawings, along with translation of the text in Yong's drawings. Hereafter, we refer to Exhibits 1010 and 1021 as "initial Yong translation materials." The supplemental exhibits also include a translation of Yong, specifically in Exhibit 1028 ("second Yong translation").

Following Petitioner's entry of the supplemental exhibits, Patent Owner contends that Petitioner's translation of Yong remains flawed, arguing that "Yong should be disregarded in its entirety."² PO Sur-reply 23. In support of this position, Patent Owner identifies certain differences between the second Yong translation and the initial Yong translation materials. PO Resp. 45–50. For example, Patent Owner identifies certain differences between (1) Figure 2 in the second Yong translation and (2) Figure 2 in Exhibit 1021 of the initial Yong translation materials. PO Resp. 45–47. Additionally Patent Owner identifies certain differences between (1) Figure 11 in the second Yong translation and (2) Figure 11 in Exhibit 1021 of the initial Yong translation materials. *Id.* at 47–50. Based on these observations, Patent Owner contends that the initial Yong translation materials and the second Yong translation are "conflicting on important points." *Id.* at 50.

Petitioner counters that Patent Owner identifies only insignificant wording differences between the second Yong translation and the initial Yong translation materials. Pet. Reply 5. Petitioner further argues that the differences "do not undermine any of the unpatentability grounds based on

² Patent Owner did not file a motion to exclude Yong.

Yong,” after which Petitioner addresses each of the differences in greater detail. *Id.* at 5–7.

Petitioner has the better position. Pet. 8–9; PO Resp. 44–50; Pet. Reply 5–7; PO Sur-reply 21–23. Having carefully reviewed the identified differences and the parties’ arguments about them, we find the differences do not rise to a level that would justify disregarding Yong, as Patent Owner would have us do. PO Sur-reply 23. Indeed, Patent Owner does not persuasively explain why any of the differences would undermine Petitioner’s anticipation and/or obviousness challenges based on Yong. PO Resp. 44–50; PO Sur-reply 21–23. To the extent any of the differences identified by Patent Owner may affect any particular aspect of Petitioner’s challenges, we have factored that into our analysis of Petitioner’s anticipation and obviousness challenges based on Yong.

E. ALLEGED OBVIOUSNESS OVER YONG AND XAVIER

1. *Overview of Yong’s Disclosure*

Yong discloses “a commercial transaction system and a commercial transaction method using a mobile communication network in which a mobile communication terminal that has already been widely distributed to consumers may be linked to a conventional POS system of a retail store.” Ex. 1010, 3.³ Yong shows a commercial transaction system in Figure 1. *Id.* at 12. Figure 1 is reproduced below.

³ When discussing Yong’s disclosure, we cite to the translation in Exhibits 1010 and 1021.

FIG. 1

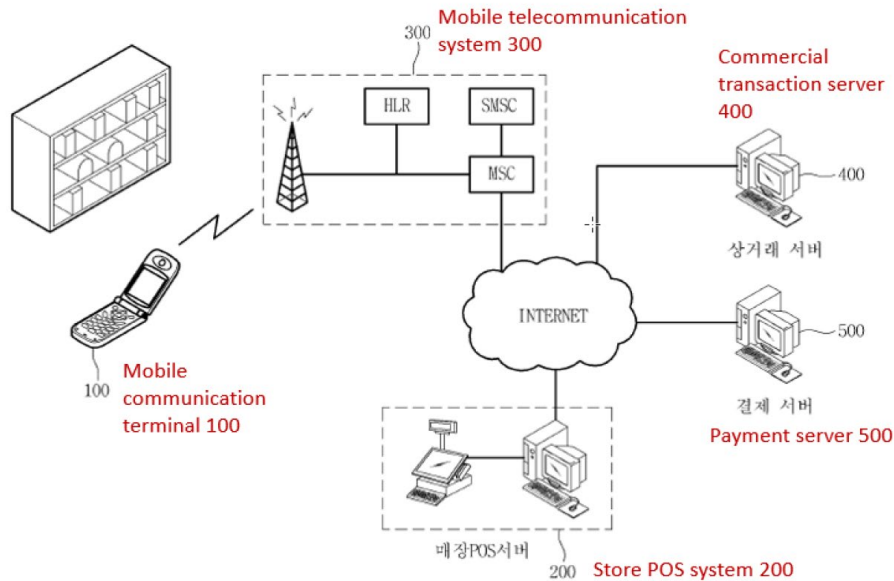


Figure 1 shows a commercial transaction system that includes “a mobile communication terminal 100, a store POS system 200, and a mobile telecommunication system 300.” Ex. 1010, 12; Ex. 1021, Fig. 1. “More preferably, a commercial transaction server 400 and a payment server 500 may be further included.” Ex. 1010, 12; Ex. 1021, Fig. 1.

Yong shows one embodiment of mobile communication terminal 100 in Figure 2. Ex. 1010, 12; Ex. 1021, Fig. 2. Figure 2 is reproduced below.

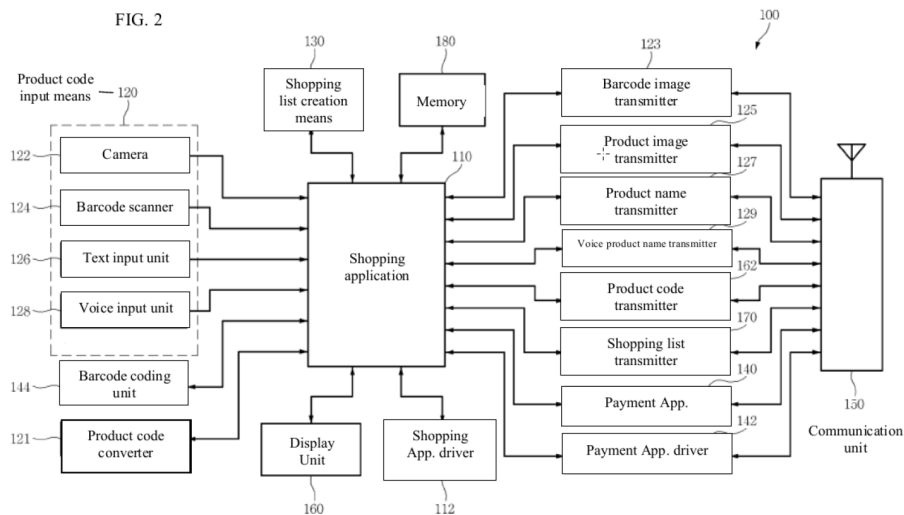


Figure 2 shows mobile communication terminal 100 having “a product code input means 120, a shopping list creation means 130, a shopping list transmitter 170, a shopping application 110, and a payment application 140.” Ex. 1010, 12; Ex. 1021, Fig. 2.

“[P]roduct code input means 120 serves a function of recognizing a product code (mc_code) of a product to be purchased.” Ex. 1010, 12. Product code input means 120 may use different approaches to extract the product code (mc_code), including the following:

in an embodiment where the product code (mc_code) is extracted by photographing a barcode image, the product code input means 120 is configured including the camera 122 for photographing a barcode image (b-code image) and a product code converter 121 for decoding the barcode image (b-code image) into a product code (mc_code).

Id. at 13.

“The shopping list creation means 130 serves a function of creating a shopping list by storing the product code (mc_code) input through the product code input means 120.” Ex. 1010, 17–18. “The shopping list is a table” that stores the product codes (mc_code) that have been selected in “a memory or the like.” *Id.* at 18.

Mobile communication terminal 100 preferably also includes display unit 160. Ex. 1010, 18; Ex. 1021, Fig. 2. Display unit 160 may show “a product name (mc_name: 164) corresponding to the product[] code (mc_code) input through the product code input means, and a product code (mc_code) included in the shopping list (shopping_list: 166).” Ex. 1010, 18. Along with the product name (mc_name), display unit 160 may show “a product price (mc_price) and an accumulated product price (mc_price: 168)

of the products included in the shopping list (shopping_list).” *Id.* To facilitate this, Yong discloses searching a database for product information:

[i]n order for the mobile communication terminal 100 to display the product name (mc_name) and the product price (mc_price), a product database 240, 440 including product names and product prices of products corresponding to the product codes (mc_code) should be searched. Three embodiments may be possible depending on the implementation location of the product database, for example, the mobile communication terminal 100, the commercial transaction server 400, and the store POS server 200.

Id. at 18–19. In one example, store POS server 200 stores product information:

in an embodiment in which the mobile communication terminal 100 retains the product information, the store POS server 200 further includes a product database 240 for storing product codes (mc_code) of products, including products being sold in the retail store, and product names (mc_name) and/or product prices (mc_price) corresponding thereto, and the mobile communication terminal 100 accesses the store POS server 200 through a communication network to receive product data including the product names (mc_name) and/or the product prices (mc_price), stores it in the memory 180, and displays a product name (mc_name) and/or a product price (mc_price) corresponding to the product code (mc_code) input through the product code input means 120 by retrieving the product name and the product code from the memory 180.

Id. at 19. In another example, commercial transaction server 400 stores product information:

in an embodiment in which the mobile communication terminal 100 retrieves the product information from the commercial transaction server 400, the mobile communication terminal 100 further includes a product code transmitter 162 for transmitting the product code input through the product code input means to the mobile communication network, and the

commercial transaction system further includes . . . a commercial transaction server 400 accessible to the mobile communication network 300 and including a product database 440 for storing the product codes (mc_code) of products, including products being sold in the retail store, and the product names (mc_name) and/or the product prices (mc_price) corresponding thereto; and a product retrieval unit 432 for transmitting, to the mobile communication terminal 100, a product name (mc_name) and/or a product price (mc_price) corresponding to the product code (mc_code) received from the mobile communication terminal 100 through the mobile communication network 300.

Id. at 19–20.

Mobile communication terminal 100 may retrieve product information from commercial transaction server 400 or from store POS server 200.

Ex. 1010, 20–21. For example, mobile communication terminal 100 may use the following process to retrieve product information from commercial transaction server 400:

the mobile communication terminal 100 may transmit the store ID (mart_ID) together with the product code when the product code (mc_code) is transmitted, and the product retrieval unit 432 of the commercial transaction server 400 may select the product database (441, 442, 443) corresponding to the transmitted store ID (mart_ID) to retrieve the product name (mc_name) and/or the product price (mc_price).

Id. at 20–21. As another example, mobile communication terminal 100 may use the following process when retrieving product information from store POS server 200:

in an embodiment in which the mobile communication terminal 100 retrieves the product information from the store POS server 200, the mobile communication terminal 100 further includes a product code transmitter 162 for transmitting the product code (mc_code) input through the product code input means 120 to the store POS server 200, and the store POS server 200 further includes a product database 240 for storing the

product codes (mc_code) of products, including products being sold in the retail store, and the product names (mc_name) and/or the product prices (mc_price) corresponding thereto; and a product retrieval unit 232 for transmitting, to the mobile communication terminal 100, a product name (mc_name) and/or a product price (mc_price) corresponding to the product code (mc_code) received from the mobile communication terminal 100.

Id. at 21.

Mobile communication terminal 100's shopping list transmitter 170 "serves a function of transmitting the shopping list (shopping_list) created by the shopping list creation means 130 to the store POS server 200."

Ex. 1010, 23. "[S]hopping list transmitter 170 may transmit the shopping list (shopping_list) through any one of the mobile communication network 300, WiBro, wireless LAN, Bluetooth, ZigBee, IrDA, and the like, or a data cable." *Id.*

"[P]ayment application 140 serves a function of making a payment according to the shopping list (shopping_list) using the mobile communication network 300." Ex. 1010, 25. "[P]ayment application 140 accesses a payment server 500 used for normal mobile payment through a communication network to perform payment." *Id.* at 26. When payment has occurred, a payment approval result may be transmitted directly or indirectly from payment server 500 to store POS server 200. *Id.* at 26–27. Payment server 500 may transmit the payment approval result to mobile application terminal 100. *Id.* at 28. Such an embodiment may include certain provisions for mobile communication terminal 100 and store POS server 200 to interact with one another regarding the payment approval result:

further includes a barcode coding unit 144 for coding the payment approval result into a predetermined barcode, the

display unit 160 displays the payment approval result barcode, and the store POS server 200 further includes a barcode recognizer 270 for recognizing the payment approval result barcode, or that the mobile communication terminal 100 further includes a payment approval result transmitter to transmit the payment approval result to the store POS server 200.

Id.

2. Discussion

In asserting obviousness of claims 1–14 over Yong and Xavier, Petitioner argues that Yong discloses many of the challenged claims’ limitations. Pet. 13–43. For example, Petitioner relies primarily on Yong as allegedly disclosing claim 1’s limitations. *Id.* at 13–26. Petitioner relies on Xavier as “teach[ing] the use of a session between a mobile phone and se[r]ver in a self-checkout system.” *Id.* at 15. Petitioner argues that “[h]aving reviewed Xavier, a [person of ordinary skill in the art] would have been motivated to add the session handling of Xavier to Yong.” *Id.* According to Petitioner, “[a person of ordinary skill in the art] would have understood that a session manager would have been necessary to manage the communications between the mobile communication terminal 100 and the store POS server 200, the commercial transaction server 400 and the payment server 500.” *Id.*

In its Response, Patent Owner argues that “Petitioner’s Yong-Xavier ground fails” for a number of reasons. PO Resp. 28. Patent Owner faults Petitioner’s translation of Yong. *Id.* at 29. Patent Owner also faults certain other aspects of Petitioner’s challenge of claim claims 1–14 as allegedly obvious over Yong and Xavier. For example, Patent Owner argues that, contrary to Petitioner’s assertions, it would not have been obvious to combine functions of Yong’s servers. PO Resp. 29–40. Additionally,

Patent Owner argues that, when addressing limitations 1m and 10k, Petitioner “cites to a barcode scanner that its construction of [virtual terminal sales application] forbids.” *Id.* at 42. Patent Owner also argues that Petitioner has shown claim 5 would have been obvious over Yong and Xavier. *Id.* at 50–55.

Having reviewed all of the parties’ arguments and evidence, we find that Petitioner demonstrates by a preponderance of the evidence that claims 1–14 would have been obvious over Yong and Xavier. Pet. 8–10, 13–44; PO Resp. 5–55; Pet. Reply 3–22; PO Sur-reply 3–23.

Regarding the quality of Petitioner’s Yong translation, as discussed above in Section II.D, we do not agree with Patent Owner’s argument that we should disregard Yong entirely. PO Sur-reply 23. Also, having carefully reviewed the specific translation issues raised by Patent Owner, we find none of the translation issues materially undermines Petitioner’s arguments and evidence that claims 1–14 would have been obvious over Yong and Xavier. Pet. 8–10, 13–42; PO Resp. 22–55; Pet. Reply 5–22; PO Sur-reply 3–23.

We turn now to detailed discussions of the parties’ other disputes regarding the challenge of claims 1–14 over Yong and Xavier.

- a) Alleged obviousness of same server in Yong*
 - (1) the parties’ arguments and evidence*
 - (a) Petition*

Petitioner argues that if “the server” is the same server throughout the claims, (1) “Yong teaches that” and (2) “a [person of ordinary skill in the art] would find it obvious to combine functions of any [of] its servers 200, 400 or 500 into the same server.” Pet. 18. In connection with these

assertions, the Petition notes that “Yong teaches the communication extends from store POS server 200 to the payment server 500 through direct connection (‘the store POS server 200 may directly connect to the payment server 500’ (Ex. 1010 26:19- 21)) or as part of a common commercial transaction system.” *Id.* Petitioner adds that “servers 200, 400 or 500 can be part of a common system 100.” *Id.* at 22. Also, stating that “[i]t was well-understood in the art at the time of the Critical Date that functionality of different servers can be combined in the same server,” the Petition argues that combining functionality of Yong’s store POS server 200, commercial transaction server 400, and payment server 500 would have been obvious because of considerations relevant to “software implementations and combining functionality of components.”⁴ *Id.* at 18–19.

(b) Patent Owner’s Response

In its Response, Patent Owner counters that Petitioner does not support its positions regarding Yong’s system with respect to the “same server” of the claims. PO Resp. 29–40. Patent Owner argues that “Petitioner’s ground fails to show why a [person of ordinary skill in the art] would have been motivated to combine the functionality of three different Yong entities loosely connected through the internet (*see* Figure 1) to implement the ‘same server.’” *Id.* at 30. According to Patent Owner, Petitioner’s observation that store POS server 200, commercial transaction server 400, and payment server 500 communicate with one another does not support Petitioner’s position. *Id.* at 34–35.

⁴ There is a dispute regarding whether the Petition included Yong’s barcode recognizer as part of this combination. We address that dispute in Section II.E.2.b) below.

Patent Owner contends that “Yong’s system is intentionally designed with distinct components.” *Id.* at 36. Patent Owner argues that “Yong’s POS system 200 is in store,” whereas “Yong’s payment server is controlled by a third-party separated from the store merchant.” *Id.* at 37. According to Patent Owner, Petitioner does not demonstrate that it would have been obvious to a person of ordinary skill in the art “to combine Yong’s merchant-controlled, in-store POS system with a third-party payment server that is ‘outside the store system.’” *Id.* In sum, Patent Owner argues that “Petitioner fails to prove the obviousness of the ‘same server’ based on Yong just as it did in its IPR2022-01561 Petition with Fletchall.” *Id.* at 29.

(c) Petitioner’s Reply

In its Reply, Petitioner maintains that it would have been obvious to combine functionalities of Yong’s servers. Pet. Reply 7–12. Petitioner argues that Patent Owner “is mistaken that Yong’s system was ‘intentionally designed with distinct components.’” *Id.* at 10. Asserting that Patent Owner “relies on selective testimony from Dr. Shamos,” Petitioner argues that “a complete review of Dr. Shamos’s testimony reveals what a [person of ordinary skill in the art] would have recognized: that the servers in Yong, such as the payment server 500, could be under the control of a single merchant.” *Id.* Petitioner maintains that Yong’s disclosure of the servers communicating with one another as part of a common system would have provided a reason to combine the server’s functionalities, asserting that “Yong also describes an embodiment where POS server 200 and payment server 500 are directly connected, making the combination of their functionality even more obvious.” *Id.* at 8. Citing evidence of known latency when servers communicate, Petitioner asserts that combining server

functions into the same server would reduce communication latency.

Id. at 10–12.

(d) *Patent Owner’s Sur-reply*

In its Sur-reply, Patent Owner maintains that it would not have been obvious to combine the functionalities of Yong’s servers. PO Sur-reply 1, 5–15. “Yong disclosed separate servers, in different locations, controlled by different parties intentionally,” Patent Owner asserts. *Id.* at 5. Patent Owner disputes Petitioner’s argument that Yong discloses directly connecting store POS server 200 and payment server 500. *Id.* at 8–11. Patent Owner asserts that Petitioner does not explain how servers controlled by different entities could have been combined. *Id.* at 11–12.

Patent Owner also argues that “Petitioner’s position directly contradicts this Panel’s finding in IPR2022-01561, and Petitioner fails to take this point head on.” *Id.* at 6. Patent Owner asserts that the idea of combining servers with a mobile communication device because those components communicate with one another in the same system “illustrates why Petitioner’s rationale for combining is plainly insufficient.” PO Resp. 7–8. Additionally, Patent Owner argues that Petitioner’s explanation and evidence of communication latency in the Reply are untimely and unavailing. *Id.* at 13–15. Patent Owner asserts that “[l]atency is not mentioned as a consideration in the Petition, and Dr. Shamos does not at any point back this argument.” *Id.* at 13. Furthermore, without disputing evidence of knowledge that consolidating servers to reduce latency sometimes makes sense, Patent Owner argues that it would not have made sense to consolidate intentionally separate servers controlled by different parties in different locations. *Id.* at 14.

(2) *Discussion*

As an initial matter, we will resolve some confusion regarding our 1561 institution decision. Patent Owner apparently reads the 1561 institution decision as explaining that Petitioner’s challenge of claim 1 over Fletchall and Xavier had argued but failed to show that it would have been obvious to combine functionalities of Fletchall’s servers. *See, e.g.,* Ex. 3001, 23–24; PO Resp. 28 (“Just like the Petition denied in IPR2022-01561, Petitioner fails to support why a [person of ordinary skill in the art] allegedly would have considered it obvious to combine the functionality of POS system 200, commercial transaction system 400, and payment server 500 to provide the ‘same server’ in view of the Panel’s claim construction.”). Patent Owner misapprehends the facts in the 1561 IPR, possibly due to potential ambiguity in our 1561 institution decision.

To clarify, unlike the Petition in this proceeding, the petition in the 1561 IPR did not argue that “a [person of ordinary skill in the art] would find it *obvious to combine functions*” of Yong’s servers when challenging claim 1 based on Fletchall and Xavier. Pet. 18 (emphasis added); Ex. 3002, 15–35; Ex. 3001, 23–24. Instead, when challenging claim 1 of the ’435 patent over Fletchall and Xavier, the petition in the 1561 IPR argued that “[e]ven if ‘the server’ in [step 1i] were construed by the Board to be limited to the same server as in antecedent steps 1e-1f, Fletchall *teaches* that also.” Ex. 3002, 30 (emphasis added).

The 1561 institution decision explained that Petitioner had not supported its position that Fletchall “teaches [using the same server].” Ex. 3001, 23–24. That does not contradict Petitioner’s arguments in this

proceeding that it would have been obvious to combine functionalities of Fletchall's servers, contrary to Patent Owner's arguments. PO Sur-reply 6.

Turning to the merits in this proceeding, having considered all of the parties' arguments and evidence, we determine that a preponderance of the evidence supports Petitioner's position that it would have been "obvious to combine functions of any [of] its servers 200, 400, 500 into the same server." *E.g.* Pet. 8–9, 18–19, 22–23, 25–26; PO Resp. 2–6, 22–25, 28–40; Pet. Reply 1–2, 7–12; PO Sur-reply 1–2, 5–15. It is undisputed that "[i]t was well-understood in the art at the time of the Critical Date that functionality of different servers can be combined in the same server." Pet. 18–19 (citing Ex. 1002 ¶ 413); *see generally* PO Resp.; PO Sur-reply.

The Petition persuades us that it would have been obvious to implement this known approach in Yong's system, notwithstanding Patent Owner's arguments about intentionally keeping servers separate. Pet. 8–9, 18–19, 22–23, 25–26; PO Resp. 2–6, 22–25, 28–40; Pet. Reply 1–2, 7–12; PO Sur-reply 1–2, 5–15. The Petition and its evidence demonstrate that a person of ordinary skill in the art would have recognized that modifying Yong's disclosure by combining the functionalities of the servers would have produced one logical variation on Yong's system. Pet. 8–9, 18–19, 22–23, 25–26; Ex. 1002 ¶¶ 112–132, 412–414, 436, 442, 452, 460. As the Petition and Dr. Shamos note, Yong's servers cooperatively perform functions of Yong's system by communicating with one another and other system components, such that consolidating the functionality into the same server would result in that server performing all of the same functions that Yong's servers do separately. Pet. 8–9, 18–19, 22–23, 25–26; Ex. 1002 ¶¶ 112–132, 412–414, 436, 442, 452, 460; *See KSR Int'l Co. v. Teleflex Inc.*,

550 U.S. 398, 418 (2007) (combination of known devices according to established functions normally obvious); *id.* at 417 (“[W]hen a patent ‘simply arranges old elements with each performing the same function it had been known to perform’ and yields no more than one would expect from such an arrangement, the combination is obvious”).

The Petition and its evidence also persuade us that such a modification would have been well within the ability of a person of ordinary skill in the art and there would have been a reasonable expectation of success. *E.g.*, Pet. 10, 18–19, 22–23, 25–26; Ex. 1002 ¶¶ 30–34, 38–42, 412, 414. As Dr. Shamos notes, Yong itself indicates that the system could use different components on its server side, disclosing that “[a] commercial transaction system (*e.g.*, a commerce system) according to the present invention is configured to include a mobile communication terminal 100, a store POS system 200, and a mobile telecommunication system 300. More preferably, a commercial transaction server 400 and a payment server 500 may be further included.” Ex. 1010, 12:9–13; Ex. 1002 ¶ 412. On the whole, the Petition persuades us that combining the functions of Yong’s servers would have involved no more than an obvious application of a known approach with predictable results. *See KSR*, 550 U.S. at 416 (“The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.”).

Additionally, Petitioner persuades us that Patent Owner overestimates certain alleged concerns driving the use of different servers by different business entities. Pet. Reply 10–12; PO Resp. 24–25, PO Sur-reply 1, 11–13. As Petitioner notes, Dr. Shamos explained that a person of ordinary skill in the art would have understood that all of the functions of Yong’s

servers, including payment server 500, could be owned by the merchant. Ex. 2011, 45:12–14; Pet. Reply 10. On the whole, Petitioner persuades us that it would have been straightforward to apply the known approach of combining server functions into the same server. Pet. 10, 18–19, 22–23, 25–26; Pet. Reply 1–2, 7–12.

Additionally, to the extent that Patent Owner and Dr. Williams are correct that Petitioner’s proposed modification may not have produced the most desirable system, that does not diminish Petitioner’s sound evidence that the proposed modification would have been obvious. Even if “better alternatives exist in the prior art,” that does not make Petitioner’s proposed combination “inapt for obviousness.” *In re Mouttet*, 686 F.3d 1322, 1334 (Fed. Cir. 2012) (citing *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994)). Moreover, in contrast to technological considerations, the business concerns alleged by Patent Owner have little or no bearing on § 103 obviousness. *Orthopedic Equip. Co., Inc. v. United States*, 702 F.2d 1005, 1013 (Fed. Cir. 1983); PO Resp. 36–38; Pet. Reply 1–2, 9–11; PO Sur-reply 10–13.

We do agree with Patent Owner that Yong’s disclosure of having store POS server 200, commercial transaction server 400, and payment server 500 communicate with one another as part of one system does not make store POS server 200, commercial transaction server 400, and payment server 500 part of the same server, much less make mobile communication terminal 100 part of the same server. PO Resp. 33–35; PO Sur-reply 7. But the salient question here is not whether separate components constitute part of the same server; it is whether it would have been obvious to combine the functionalities of store POS server 200, commercial transaction server 400, and payment server 500 into the same server.

For the foregoing reasons, we find that a preponderance of the evidence supports Petitioner's position that it would have been obvious to combine the functionalities of store POS server 200, commercial transaction server 400, and payment server 500 the same server. We reach this result even without factoring in the evidence and arguments in Petitioner's Reply regarding latency.

Furthermore, we do not agree with Patent Owner's suggestion that Petitioner's latency arguments and evidence are untimely. PO Sur-reply 13–15. To the contrary, Petitioner's latency arguments and evidence properly respond to Patent Owner's arguments by expanding on arguments and evidence entered with the Petition. Pet. 18–19, 22–23, 25–26; Pet. Reply 10–11. For example, in the Petition, Petitioner argues that combining the functions of Yong's communicatively linked servers would have been obvious due to design considerations for “software implementations and combining functionality of components,” among other things. Pet. 18–19. Petitioner's Reply properly elaborates on this position by providing greater detail regarding one such well-known design consideration: latency between communicatively linked components. Pet. Reply 10–11.

Additionally, the obviousness position presented in the Petition, which is persuasive on its own, is enhanced by the Reply's explanation and evidence regarding latency with Yong's communicatively linked servers. Petitioner persuades us that a person of ordinary skill in the art would have recognized that combining the functionalities of Yong's servers would have reduced communication latency. Pet. Reply 10–11.

Indeed, Patent Owner does not dispute that it was recognized in the art that combining server functions would reduce latency associated with separate, communicatively linked servers interacting. *See generally* PO Sur-reply. Rather, Patent Owner argues that this approach would have had drawbacks in some applications, such as systems with intentionally separated servers controlled by different business entities. PO Sur-reply 13–15.

Again, compared to Petitioner’s evidence that it was known and would have been straightforward and advantageous to combine server functions in Yong’s system, we find unpersuasive Patent Owner’s arguments and evidence about intentionally keeping servers separated. Pet. 18–19, 22–23, 25–26; PO Resp. 36–38; Pet. Reply 7–12; PO Sur-reply 5–15. Even if the proposed combination would not have produced the most desirable system, that does not negate Petitioner’s sound arguments and evidence that it would have been obvious to combine server functions in Yong’s system in view of certain recognized benefits of doing so. *Fulton*, 391 F.3d at 1202 (Fed. Cir. 2004) (The prior art need not “teach that a particular combination is preferred or ‘optimal,’ for the combination to be obvious.”).

b) VTSA/peripheral dispute

The parties dispute whether Petitioner’s arguments regarding limitations 1m and 10k comport with Petitioner’s construction of the claim language “virtual terminal sales application” (i.e., “VTSA”). Pet. 8–9, 11–12, 26, 42; PO Resp. 7, 22–25, 41–44; Pet. Reply 16–18; PO Sur-reply 15–19. In addressing limitation 1m’s recitation of “optically scanning the machine-readable element rendered on the display of the mobile phone, by an optical scanning machine in communication with the

server,” Petitioner argues that “Yong discloses optically scanning the displayed barcoded payment approval result with an optical scanning device (‘barcode recognizer’) in communication with the server (store POS server).” Pet. 26. In support of this, Petitioner cites, among other things, Yong’s disclosure that “the specific payment approval result may be decoded and displayed as a specific payment approval barcode, and a store POS server may check it using a conventional barcode recognizer.” Ex. 1010, 8:15–17; Pet. 26. Petitioner also cites Yong’s disclosure that “the store POS server 200 further includes a barcode recognizer 270 for recognizing the payment approval result barcode.” Ex. 1010, 28:9–11; Pet. 26. When addressing limitation 10k, Petitioner cites its arguments and evidence addressing limitation 1m. Pet. 42.

Patent Owner argues that “Petitioner’s mapping of Yong for claim 1 cites to a barcode scanner that its construction of [virtual terminal sales application] forbids.” PO Resp. 42. Patent Owner asserts that “Petitioner argues that Yong’s POS server 200’s barcode recognizer 270 is equivalent to the claimed ‘optical scanning machine’ in its analysis of elements [1m] and [10k].” *Id.* Patent Owner further argues that “Yong describes barcode recognizer 270, shown in [Figure] 3, as being part of the store POS system 200 (Ex. 1010, 28:9-11), which Petitioner also relies on, in part, as teaching the claimed ‘server.’” *Id.* at 43. Based on these assertions, Patent Owner contends that Petitioner’s position regarding limitations 1m and 10k “is plainly inconsistent with its construction of [virtual terminal sales application] as ‘an application running on the server which mirrors functions of a point-of-sale (POS) terminal *without the peripheral devices of a POS terminal.*’” *Id.* at 44.

In its Reply, Petitioner counters that “Petitioner’s [virtual terminal sales application] construction does not undermine Petitioner’s claim mapping with respect to Yong.” Pet. Reply 17–18. In support of this position, Petitioner argues that Yong’s barcode recognizer is in communication with its cash register, which is in communication with its server. *Id.* at 17. “This element separation, confirmed by PO’s expert . . . , results in the computer executing the [virtual terminal sales application] without any peripheral devices, such as [Yong’s] barcode recognizer 270, which is a peripheral of the cash register (traditional POS terminal) rather than a server,” Petitioner asserts. *Id.*

Patent Owner responds that Petitioner’s Reply presents a new argument by “mak[ing] a distinction that it is the cash register component that has a peripheral device of the barcode recognizer 270, such that there is no peripheral device within Yong’s POS system 200 that Petitioner cited,” “despite Petitioner’s expert clearly citing to the entirety of Yong’s ‘store POS system 200’ in his expert declaration.” PO Sur-reply 15–16. Patent Owner contends that “Petitioner’s new position that certain of the Petition’s citations were only to the ‘server portion’ of Yong reference 200 is not supported by the Petition, its own expert, or Yong’s disclosure and it should be disregarded.” *Id.* at 16. Patent Owner also argues that “Yong fails to support” Petitioner’s position. *Id.* at 17. In support of this contention, Patent Owner argues that Yong discloses barcode recognizer is part of “store POS server 200.” *Id.*

Weighing the parties’ arguments and evidence, we find Petitioner has the better position. Pet. 8–9, 11–12, 26, 42; PO Resp. 7, 22–25, 41–44; Pet. Reply 16–18; PO Sur-reply 15–18. As Petitioner notes, Dr. Shamos and Dr.

Williams agree that Yong's Figure 1 shows that the components identified with reference numeral 200 include both a computer and a cash register. Ex. 2011, 25:8–13; Ex. 1022, 60:17–18, 21–23; Pet. Reply 14–15. And Petitioner persuades us that a person of ordinary skill in the art would have understood that Yong's barcode recognizer 270 and cash register are peripheral devices separate from the computer, as Dr. Williams recognizes. Pet. Reply 13–16; Ex. 1022, 60:2–5, 60:17–18, 60: 21–23.

Additionally, contrary to Patent Owner's argument, the Reply is a persuasive, procedurally proper rebuttal of Patent Owner's argument that the Petition and Dr. Shamos cited either of Yong's cash register and barcode scanner 270 peripherals (as opposed to the computer in Figure 1) as part of "the server" in the challenged claims. PO Resp. 42–44; Pet. Reply 16–18; PO Sur-reply 15–17. Patent Owner's argument rests on a tortured interpretation of the Petition and Dr. Shamos's Declaration. PO Resp. 42–44; PO Sur-reply 15–17. The Petition and Dr. Shamos both take the position that Yong's barcode scanner 270 is "in communication with the server." *E.g.*, Pet. 26; Ex. 1002 ¶¶ 458–460. This conveys that Petitioner and Dr. Shamos do not cite barcode scanner 270 as part of "the server," as it would defy logic to suggest that barcode scanner is both (1) in communication with "the server" and (2) part of "the server." Thus, Petitioner's Reply properly responds to Patent Owner's arguments by confirming what was already clear from the Petition and Dr. Shamos's declaration: neither the Petition nor Dr. Shamos cites Yong's barcode scanner 270 as part of "the server." PO Resp. 42–44; Pet. Reply 16–18; PO Sur-reply 15–18. In sum, Petitioner persuades us that, contrary to Patent Owner's arguments, the Petition's arguments about Yong's barcode

scanner 270 and server comport with Petitioner's construction of "virtual terminal sales application."

c) Claim 5

Claim 5 depends from claim 1. Ex. 1001, 22:13. Adding to claim 1's recitation of "the server executing a virtual terminal sales application" (*id.* at 21:37–38), claim 5 recites "a plurality of virtual terminal sales applications executing on the server" (*id.* at 22:13–14).

Petitioner argues that "Yong discloses that the server executes a virtual terminal sales application" (Pet. 17), adding that "the Yong-Xavier combination discloses a VTSA executing on a server to process the payment for the transaction and which processes the payment for the transaction after the transaction is transferred to one of the plurality of virtual sales terminals from either the mobile phone (100) or another VTSA" (*id.* at 31–32). Explaining that "[t]he Yong-Xavier combination does not explicitly disclose using multiple simultaneous instances of the VTSA executing on a server which processes the payment," Petitioner asserts that "it would have been obvious to a POSITA to use the common technique of creating multiple instances of a VTSA on a server in the Yong-Xavier combination to improve throughput in transaction processing":

Having multiple shoppers contend for access to a single instance of a payment application would result in delays and customer dissatisfaction. (*Id.*) Yong and Xavier also would have suggested to a POSITA the use of multiple instances to improve throughput, because Yong and Xavier describe examples that suggest the importance of adding scalability to improve performance and throughput, such as, the desired goal to increase efficiency of data network communication (Exhibit 1010 6:20–22) and to have a stable server with an application program hosting a set of services (Ex. 1011 ¶ 33; Shamos ¶ 487).

Id.

Patent Owner argues that Petitioner's proposes an arrangement that "is certainly not obvious" and may be technically infeasible. PO Resp. 51. According to Patent Owner, "if [Petitioner's proposed modification] could be accomplished at all in Yong-Xavier, it would require immense processing resources and coordination" because Yong's server-side architecture has "three disparate entities." *Id.* at 52.

Patent Owner argues that Dr. Shamos's testimony does not support Petitioner's position. *E.g.*, PO Resp. at 52–53. For example, Patent Owner argues that "Dr. Shamos suggests that '[h]aving multiple shoppers contend for access to a single instance of a payment application would result in delays and customer dissatisfaction,' but provides no support for this statement." *Id.* at 52. Regarding Dr. Shamos's testimony that Yong and Xavier evince advantages of scalability, Patent Owner argues that "neither Yong nor Xavier describes efficiency in the context of virtual architecture scalability (e.g., multiple VTSAs)." *Id.* at 53. Citing deposition testimony, Patent Owner contends that Dr. Shamos's "reliance on Yong's teaching that 'increasing efficiency of data network use of the mobile telecommunication service providers to improve the profitability through data communications' relates to the convenience provided by the customer using his mobile phone, not by any virtual architecture scalability provided by multiple VTSAs." *Id.*

Patent Owner also disputes Dr. Shamos's view that Xavier indicates advantages to scalability. *Id.* at 53–54. Asserting that Xavier focuses on stability, Patent Owner argues that "scalability can often disrupt performance and can render systems unstable." *Id.* at 54.

Patent Owner further argues that Petitioner impermissibly relies on Dr. Shamos's testimony to supply a claim limitation that the prior art does not disclose. *Id.* Patent Owner urges that “[t]he Board has recognized that it “is particularly problematic in cases where, like here, expert testimony is offered not simply to provide a motivation to combine prior-art teachings, but rather to supply a limitation missing from the prior art.” *Id.* (citing *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624 Paper No. 9 at 16 (PTAB Aug. 24, 2022); *Arendi S.A.R.L. v. Apply, Inc.*, 832 F.3d 1355, 1361–62 (Fed. Cir. 2016)).

Patent Owner argues that Xavier also fails to disclose “multiple applications on [its] server that process ‘the payment for the transaction after the transaction is transferred to one of the plurality of virtual sales terminals from either the mobile phone or from another virtual sales terminal application.’” *Id.* at 55. Indeed, Xavier does not “suggest to a [person of ordinary skill in the art] that this is a possibility in Xavier’s system,” Patent Owner argues. *Id.*

Weighing the parties’ arguments and evidence, we find Petitioner’s more persuasive. Pet. 8–10, 17–19, 30–33; PO Resp. 22–28, 50–55; Pet. Reply 18–20; PO Sur-reply 19–20. As an initial matter, contrary to certain Patent Owner arguments, in support of his testimony regarding claim 5, Dr. Shamos cites objective evidence, specifically disclosures of Yong and Xavier. PO Resp. 52; Ex. 1002 ¶¶ 485–489. Indeed, Dr. Shamos and Dr. Williams both support their opinions with citations to Yong and Xavier, and Dr. Williams’s testimony regarding claim 5 does not cite any supporting evidence other than Yong or Xavier. Ex. 1002 ¶¶ 485–489; Ex. 2009 ¶¶ 97–103. And, compared to the positions explained by Dr. Williams and

Patent Owner, the positions explained by Dr. Shamos and Petitioner persuade us that claim 5 would have been obvious in view of Yong and Xavier, as explained below. Pet. 17–19, 30–33; Ex. 1002 ¶¶ 485–489; PO Resp. 50–55; Ex. 2009 ¶¶ 97–103; Pet. Reply 18–20; PO Sur-reply 19–20.

Petitioner persuasively supports its assertion that Yong discloses server-side execution of a virtual terminal sales application. Pet. 17–19 (citing Ex. 1010, 12:9–13, 20:10–18, 26:19–21, Fig. 1; Ex. 1002 ¶¶ 407–415; Ex. 1001, 14:59–62, 15:30–53, 18:59–19:5, 19:36–38, 19:49–20:7, 20:33–36, Figs. 19–21). This showing is not undermined by Patent Owner’s suggestion that “coordinating *one* VTSA across Yong’-Xavier’s system would have been immensely complicated” (PO Resp. 52) because “Petitioner relies upon functionality across three disparate entities to allege that a single VTSA is taught by the Yong-Xavier combination” (*id.* at 50). As explained above in Section II.E.2.a), Petitioner persuades us that it would have been obvious to combine server-side functions in Yong’s system onto the same server. This addresses Patent Owner’s concerns that Yong’s “disparate entities” would have detracted from Yong’s disclosure of one instance of a virtual terminal sales application, or from the obviousness of replicating the disclosed virtual terminal sales application. PO Resp. 51–52; PO Sur-reply 20.

Additionally, Petitioner persuasively supports its position that it would have been obvious to replicate the virtual terminal sales application disclosed by Yong. Pet. 30–33; Pet. Reply 18–20. It is undisputed that the prior art suggests advantages to scalability, which would have provided a reason to implement multiple instances of the VTSA. Pet. 32; PO Resp. 50–55; Pet. Reply 18–20; PO Sur-reply 19–20. In view of this,

Petitioner persuades us that a person of ordinary skill in the art would have had reason to proliferate Yong’s virtual terminal sales application, for example to provide benefits related to improved efficiency and throughput. Pet. 32; Pet. Reply 18–20. Petitioner’s showing of a reason to replicate Yong’s virtual terminal sales application is not undermined by Patent Owner’s argument that the prior art’s discussion of scalability does not refer expressly to “virtual architecture scalability (e.g., multiple VTSAs).” PO Resp. 53; *KSR*, 550 U.S. at 417 (Obviousness analysis “need not seek out precise teachings directed to the specific subject matter of the challenged claim.”). And Patent Owner does not persuasively support its suggestion that the recognized advantages of scalability somehow only relate to the customer using a mobile phone, as opposed virtual architecture scalability. PO Resp. 53.

Furthermore, Petitioner’s arguments and evidence persuade us that, contrary to Patent Owner’s position, a person of ordinary skill in the art would have had a reasonable expectation of success and the skill to implement multiple instances of Yong’s virtual terminal sales application. Pet. 10, 17–19, 30–33; Ex. 1002 ¶¶ 485–489; PO Resp. 50–55; Ex. 2009 ¶¶ 97–103; Pet. Reply 18–20; PO Sur-reply 19–20. Again, Petitioner’s showing that it would have been obvious to combine server-side functions on the same server, as discussed above in Section II.E.2.a) renders moot Patent Owner’s argument about “*how* spawning multiple VTSA’s across Yong-Xavier’s three disparate entities might possibly be accomplished.” PO Resp. 52.

Petitioner’s evidence of benefits associated with scalability also persuades us that replicating Yong’s virtual terminal sales application would

have been obvious notwithstanding the stability issues alleged by Patent Owner. Pet. 30–33; PO Resp. 53–54; Pet. Reply 18–20; PO Sur-reply 19–20. In support of its suggestion that replicating Yong’s virtual terminal sales application might undermine stability, Patent Owner cites Dr. Williams’s testimony, which cites no objective support for the assertion that “scalability can often disrupt performance and render systems unstable.” PO Resp. 53–54; Ex. 2009 ¶ 101. Moreover, even if it was recognized that some reduction of stability would have resulted from replicating the virtual terminal sales application, we find Petitioner’s evidence of efficiency benefits resulting from scalability of the virtual terminal sales application support a conclusion of obviousness. Pet. 30–33; PO Resp. 53–54; *Winner Int’l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 n.8 (Fed. Cir. 2000) (explaining “[t]he fact that the motivating benefit comes at the expense of another benefit, . . . should not nullify its use as a basis to modify the disclosure.”).

Additionally, we do not agree with Patent Owner’s suggestion that Petitioner improperly relies on Dr. Shamos’s testimony to supply an element missing from the prior art. PO Resp. 54. Claims 1 and 5 require the “virtual terminal sales application” element in different numbers. Ex. 1001, 21:37–38, 22:13–14. After showing that the prior art discloses the claimed virtual terminal sales application element, Petitioner relies on Dr. Shamos’s testimony rooted in and supported by disclosures of the prior art when showing that it would have been obvious to use more than one of the disclosed element, even if Yong does not expressly discuss using more than one of the disclosed element. Pet. 17–19; 30–33; Ex. 1002 ¶¶ 407–415, 485–489.

In sum, having reviewed all of the parties' arguments and evidence, we find that Petitioner has demonstrated by a preponderance of the evidence that claim 5 would have been obvious over Yong and Xavier. Pet. 8–10, 17–19, 30–33; PO Resp. 22–28, 50–55; Pet. Reply 18–20; PO Sur-reply 19–20.

III. CONCLUSION

In summary:

Claims	35 U.S.C. §	References/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–14	103	Yong, Xavier	1–14	
Overall Outcome			1–14 ⁵	

IV. ORDER

In consideration of the foregoing, it is:

ORDERED that claims 1–14 of U.S. Patent No. 10,803,435 B2 have been shown, by a preponderance of the evidence, to be unpatentable; and

⁵ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding, 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. §§ 42.8(a)(3), (b)(2).

FURTHER ORDERED that, because this is a Final Written Decision, the 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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