

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC. and GOOGLE LLC,
Petitioner,

v.

SPACETIME3D, INC.,
Patent Owner.

IPR2023-00242
Patent 8,881,048 B2

Before DAVID C. McKONE, SHEILA F. McSHANE, and
FREDERICK C. LANEY, *Administrative Patent Judges*.

McKONE, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining Some Challenged Claims Unpatentable
Dismissing Patent Owner's Motion to Exclude
35 U.S.C. § 318(a)

I. INTRODUCTION

A. Background

Apple Inc. filed a Petition (Paper 2, “Pet.”) requesting *inter partes* review of claims 1–18 of U.S. Patent No. 8,881,048 B2 (Ex. 1001, “the ’048 patent”). SpaceTime3D, Inc. (“Patent Owner”) filed a Preliminary Response (Paper 6, “Prelim. Resp.”). Petitioner also filed a Preliminary Reply (Paper 7) and Patent Owner filed a Preliminary Sur-reply (Paper 8).

The Board instituted an *inter partes* review of the challenged claims pursuant to 35 U.S.C. § 314. Paper 11 (“Inst. Dec.”). We joined Google LLC as a party to the proceeding (collectively, with Apple Inc., “Petitioner”). Paper 14.

After institution, Patent Owner filed a Patent Owner Response (Paper 16, “PO Resp.”). Petitioner filed a Reply (Paper 26, “Reply”) and Patent Owner filed a Sur-reply (Paper 35, “Sur-reply”). The parties then presented oral arguments via a (video) Hearing (March 18, 2024), and the Board entered a Hearing transcript into the record (Paper 44).

Patent Owner filed a Motion to Exclude Evidence (Paper 34), Petitioner responded to that motion (Paper 36) and Patent Owner filed a reply (Paper 38).

For the reasons set forth in this Final Written Decision pursuant to 35 U.S.C. § 318(a), we determine that Petitioner has demonstrated, by a preponderance of the evidence, that claims 14–18 are unpatentable, but has not demonstrated that claims 1–13 are unpatentable. We dismiss Patent Owner’s Motion to Exclude as moot.

B. Related Proceedings

Petitioner indicates, and Patent Owner agrees, that the '048 patent is being asserted in *SpaceTime3D, Inc. v. LG Electronics Inc.*, No. 2:22-cv-00049 (E.D. Tex. 2022) and *SpaceTime3D, Inc. v. Apple Inc.*, No. 6:22-cv-00149 (W.D. Tex. 2022). Pet. 92; Paper 3.

Petitioner and Patent Owner also indicate that the '048 patent was involved in *SpaceTime3D, Inc. v. Samsung Electronics Co.*, No. 2:19-cv-00372 (E.D. Tex.) (“Samsung case”), which has terminated, and IPR2020-01417, in which the petition was dismissed prior to institution. Pet. 92; Paper 3.

The '048 patent is also subject to *ex parte* reexamination in 90/019,353. We stayed the reexamination pending the outcome of this proceeding. Paper 50.

C. The '048 patent (Ex. 1001)

The '048 patent relates to “a three-dimensional(‘3D’) interactive computing interface and sorting interface comprising information from real-time and static sources, including . . . meta search results from the Web.” Ex. 1001, code (54), 1:30–33.

The '048 patent addresses the problem of finite space on a computer’s desktop interface whereby “elements of the [Graphical User Interface (“GUI”)] (the windows) are typically drawn on top of each other such that the GUI components overlap one another.” *Id.* at 2:8–10. The '048 patent notes that “[w]e live in a 3D . . . world” and the “notion of expressing depth or time in a visual computer metaphor is important for the creation of a visual history of the end user’s computing sessions.” *Id.* at 2:14–20.

Accordingly, the '048 patent observes the potential to create “a virtual space that does not overlap or substitute what exists on the finite desktop,” and proposes “an improved graphical user interface that allows the user to efficiently navigate through a virtual space wherein groups of windows can be easily organized, stored, and retrieved.” *Id.* at 2:20–24, 2:40–43.

“The invention provides a Graphical User Interface (GUI) that uses the two-dimensional display of an end user’s computer to display information (e.g., webpages and other information mapped onto 3D objects) in a simulated real-time 3-D immersive Cartesian space.” Ex. 1001, 7:59–63. “The 3D GUI program creates the appearance of a 3-D space within a 2-D window on the desktop of a computer” *Id.* at 7:66–67. This is depicted in Figure 10, reproduced below.

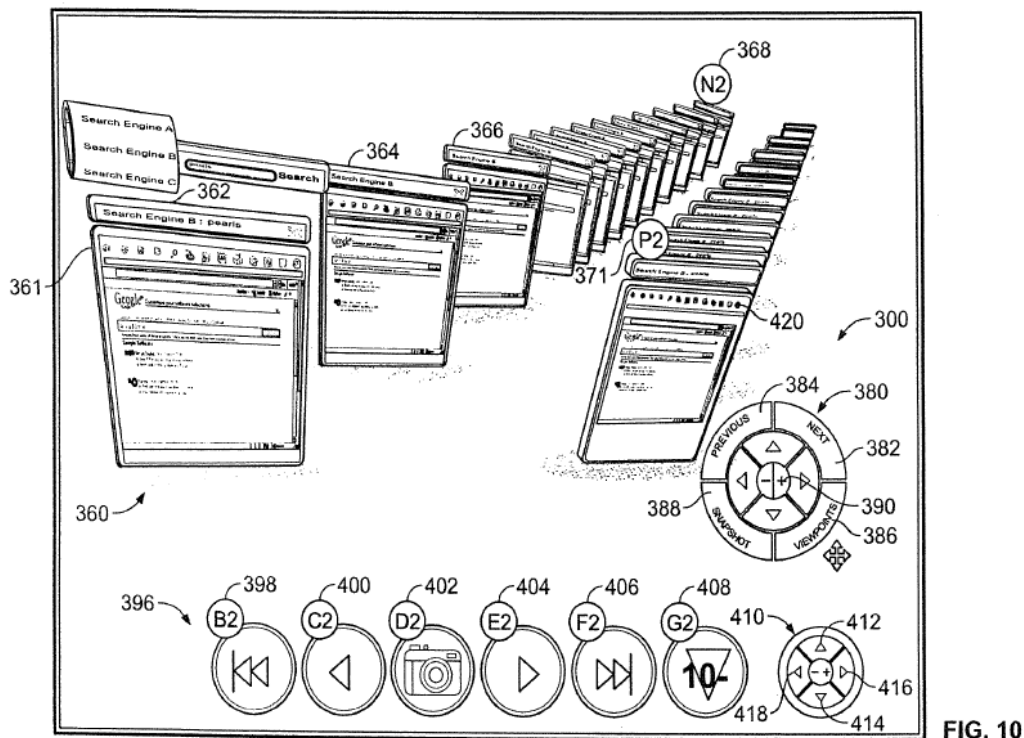


Figure 10 of the '048 patent is a drawing of simulated 3D virtual space 300 displayed within a 2D window. Ex. 1001, 6:30–31, 17:64. “The program

creates what seems to be an infinite simulated 3-D Cartesian space within the two-dimensional display . . . [and] creates interactivity of the simulated real-time 3-D immersive Cartesian space.” *Id.* at 8:6–20.

Figure 11 of the '048 patent is reproduced below:

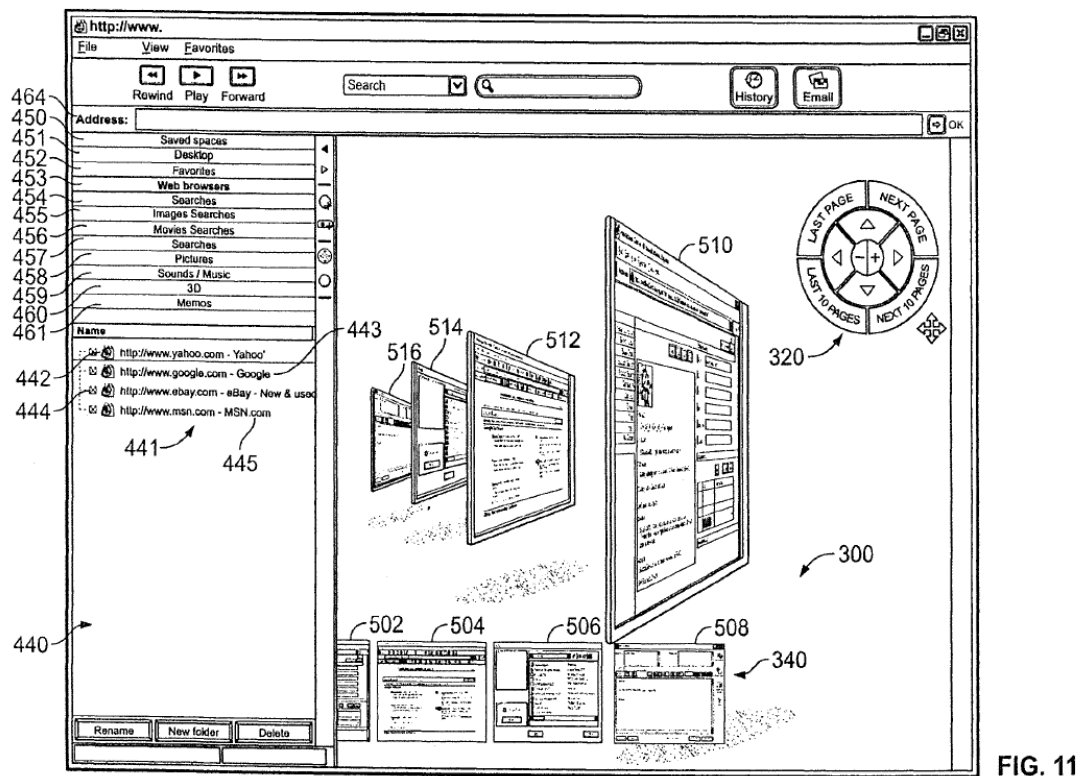


Figure 11 depicts “an embodiment of a 3D GUI application window with an opened database module.” *Id.* at 6:32–33. Figure 11 shows virtual space 300 along with interface 440 called a compass or database module. *Id.* at 9:66–10:4. Compass or database module 440 is “located to the left of the display of the virtual space 300.” *Id.* at 10:2–4. Compass 440 includes names of viewpoints in virtual space 300 where the “names constitute a map of the 3D space as well as a method to navigate the map.” *Id.* at 10:7–11. In the example shown in Figure 11, when a “tab called Web Browsers 453” is selected, compass 440 lists “the names of four viewpoints of the webpages

(shown in the main window or virtual space) . . . whose viewpoint names as they relate to the compass (and are listed as such) are ‘http://www.yahoo.com—Yahoo!’ 442, ‘http://www.google.com—Google’ 443, ‘http://www.ebay.com—ebay’ 444 and ‘http://www.msn.com—MSN’ 445.” *Id.* at 10:34–48. At the bottom of the virtual space in Figure 11 “there is provided a linear map, called a timeline 340, having a plurality of icons (502, 504, 506, 508),” which “represent viewpoints indexed in the compass 440 and correspond to the windows 510, 512, 514, 51[6], respectively.” *Id.* at 10:11–16. Windows 510, 512, 514, and 516 are displayed three-dimensionally above the timeline icons. “[E]ach 3D icon (502, 504, 506, 508) is a hyperlink or graphic that jumps to a new location or viewpoint (when clicked).” *Id.* at 11:47–49.

Figure 13B of the '048 patent is reproduced below:

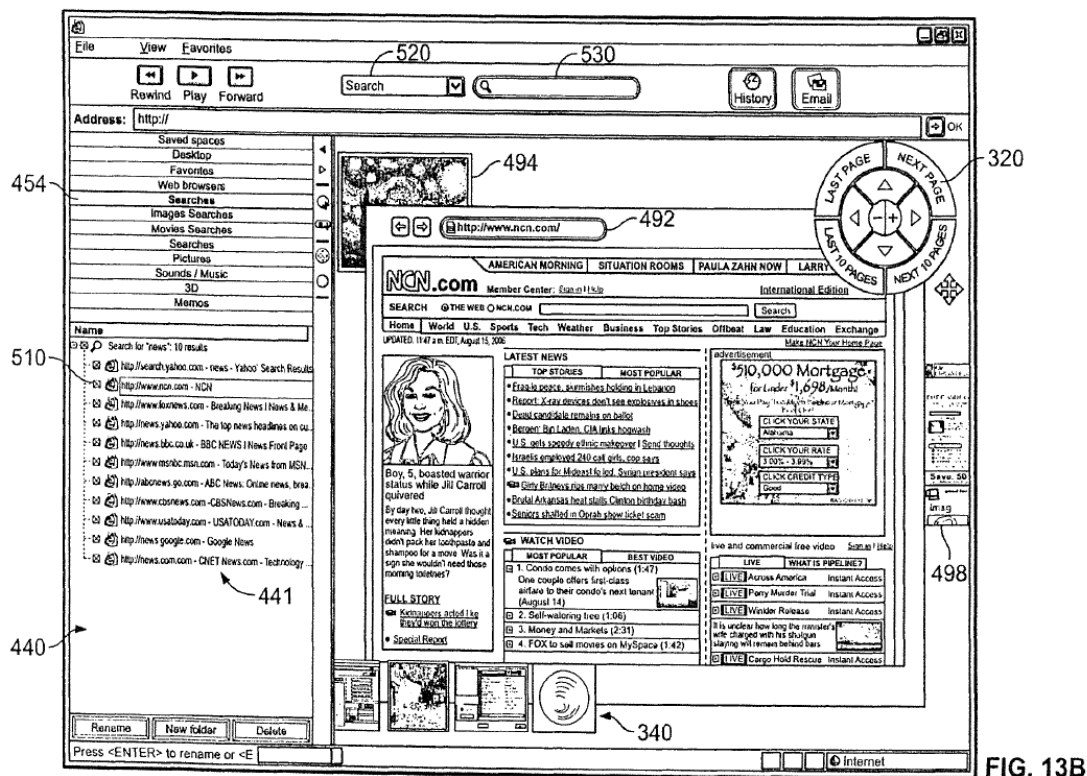


Figure 13B depicts a 3D-GUI application window with an opened database module. *Id.* at 6:37–38. Figure 13B shows an example of clicking a name in compass 440 to present a favorable viewpoint of a webpage in the virtual space. *See id.* at 21:5–19. As shown in Figure 13B, in which search tab 454 is selected, clicking on one of the “indexed names (viewpoints)” in explorer pane 441 “brings a favorable viewpoint/perspective of the output for this particular webpage in the 3D virtual space to the end user’s view.” *Id.* at 21:5–12. In this way,

each name indexed in the explorer pane of the window (compass or data base module 440) . . . serves both as an index of the search results . . . as well as a hyperlink or trigger to a favorable viewpoint within the 3D virtual space of each webpage within the search results.

Id. at 21:12–19.

The ’048 patent notes, however, that an end user may “occupy[] an unfavorable viewpoint in the virtual space where objects are drawn in skew,” therefore making it “difficult to interact with a file.” *Id.* at 21:20–24. In this case, a “heads-up display” feature allows for clicking an icon to “trigger[] a change to the viewpoint of the end user within the virtual space . . . thereby making it easier to interact with.” *Id.* at 21:29, 21:39–45. This may be “accomplished by revealing the 2D version of the webpage that was initially hidden or drawn off screen and positioning it in a layer that is in front of the 3D virtual space such that the end user can interact with this layer in 2D.” *Id.* at 21:45–49. Further, “an end user can toggle or switch between 2D and 3D for any selectively captured computing output and information . . . that was drawn within a 3D virtual space.” *Id.* at 21:54–58.

Claims 1 and 14 are illustrative and are reproduced below, with bracketing similar to Petitioner’s annotations (Pet. i–ii):

1. [1pre] A method for providing a three-dimensional (3D) graphical user interface, comprising:

[1a] receiving at least first and second inputs from an end user;

[1b] receiving first and second webpages from at least one server in response to said first and second inputs, wherein the first and second inputs are website addresses corresponding to said first and second webpages, respectively;

[1c] displaying at least a portion of the first webpage on a first object within a 3D space, and at least a portion of the second webpage on a second object within the 3D space, comprising;

[1ci] rendering the first and second webpages;

[1cii] capturing first and second images of the at least a portion of the first webpage and the at least a portion of the second webpage, respectively; and

[1ciii] texturing the first image on the first object and the second image on the second object, the first object being displayed in a foreground of the 3D space and the second object being displayed in a background of the 3D space; and

[1d] displaying additional information, comprising:

[1di] receiving an interaction by the end user on the first image;

[1dii] replacing the first and second objects within the 3D space with a window within a two-dimensional (2D) space in response to receiving the interaction, wherein the window includes the rendered first webpage;

[1diii] receiving an interaction by the end user on a link provided in the rendered first webpage,

the link corresponding to the additional information;

[1div] rendering the additional information; and

[1dv] displaying the rendered additional information in said window within the 2D space.

14. [14pre] A method for providing a three-dimensional (3D) graphical user interface, comprising:

[14a] receiving at least first and second website addresses from an end user;

[14b] using said first and second website addresses to retrieve first and second webpages from at least one source in response to said first and second inputs;

[14c] displaying at least a portion of the first webpage within a 3D space, and at least a portion of the second webpage within the 3D space, comprising;

[14ci] generating first and second images of the at least a portion of the first webpage and the at least a portion of the second webpage, respectively; and

[14cii] displaying the first image and the second image in the 3D space, the first image being displayed in a foreground of the 3D space and the second image being displayed in a background of the 3D space; and

[14d] displaying additional information to said end user, comprising:

[14di] receiving an interaction from the end user with the first image;

[14dii] replacing the first and second images within the 3D space with a window within a two-dimensional (2D) space in response to receiving the interaction, wherein the window includes the first webpage;

[14diii] receiving an interaction by the end user on a link provided in the first webpage, the link corresponding to the additional information; and

[14div] displaying the additional information to the user.

D. Asserted References and Testimonial Evidence

Petitioner relies on the following references:

Name	Reference	Date	Exhibit No.
Gettman	US 2005/0086612 A1	Apr. 21, 2005	1006
Gralla	PRESTON GRALLA, HOW THE INTERNET WORKS (6th ed.)	2002	1005
Robertson	US 6,414,677 B1	July 2, 2002	1004
Sauve	US 2006/0230356 A1	Pub. Oct. 12, 2006 (filed Apr. 7, 2005)	1007
Tsuda	US 6,577,330 B1	June 10, 2003	1008

Petitioner also relies on the Declaration of Dr. Henry Fuchs (Ex. 1003) and the Supplemental Declaration of Dr. Henry Fuchs (Ex. 1060).

Patent Owner relies on the Declaration of Dr. Eddie Bakhsh (Ex. 2001) and the Declaration of Scott Shaefer (Ex. 2014).

E. Instituted Grounds

We instituted a trial under the following grounds:

Ground	Claims Challenged	35 U.S.C. §	Reference(s)/Basis
I	1–18	§ 103(a) ¹	Robertson, Gralla, Gettman
II	1–18	§ 103(a)	Sauve, Tsuda

II. ANALYSIS

A. Claim Construction

We construe claims “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b), including construing the claim in accordance with the ordinary and customary meaning of such 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) (2019); *see also Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc).

1. “3D space” and “two-dimensional (2D) space”

As we stated in the Institution Decision, at page 20, the parties agree that the claim terms “3D space” and “two-dimensional (2D) space” recited

¹ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. § 103. Because the challenged claims of the ’048 patent have an effective filing date before the effective date of the applicable AIA amendments, we refer to the pre-AIA version of 35 U.S.C. § 103 throughout this Decision.

in claims 1, 8, and 14 should be construed as “a virtual space defined by a three-dimensional coordinate system” and “a finite graphical area defined by a two-dimensional coordinate system,” respectively. Pet. 13–14; PO Resp. 19–20 (citing Ex. 2010, 16–17). Here, the parties’ agreement stems from the constructions given by the District Court in the Samsung case. Ex. 2010, 19.

Despite this agreement, Patent Owner contends that “these constructions should be viewed in light of the [Samsung] Court’s attendant reasoning.” PO Resp. 20. Patent Owner argues that “a 2D browser can exist in 3D space” and also that, “[w]hile a 2D browser may constitute ‘a window,’ it does not define the space in which the window exists.” *Id.* Patent Owner appears to glean this distinction from the District Court’s observation that “objects” are recited separately from “spaces” in the challenged claims. *Id.* (citing Ex. 2010, 16–17). Patent Owner does not explain persuasively why this distinction would lead a skilled artisan to conclude that a 2D browser does not define the space in which a window exists. To the extent Patent Owner is arguing that a 2D space is a virtual space into which a window (such as a browser window) may be placed, the District Court made clear that a 2D space is not a virtual space:

Defendants also argue that the “3D space” and “2D space” are both virtual spaces. This argument is not consistent with use of the term “virtual” in the intrinsic evidence. The specification describes the 3D space as a “seemingly unlimited space” that creates the “illusion of infinite space in three dimensions.” In contrast, the specification describes the 2D space as the “finite working graphical area” of the desktop, and not as a virtual space.

Ex. 2010, 17 (citing Ex. 1001, 2:4–10, 4:62–63, 21:59–60). A browser defines a finite working 2D graphical area of the desktop and includes a window that displays a 2D webpage. Ex. 1003 ¶ 125; Ex. 1005, 134–135.

Patent Owner appears to argue that a browser window is not a window within a 2D space. PO Resp. 3 (“[T]he ’048 Patent clearly provide that the terms 2D and 3D define the space—not the objects presented therein. This is also consistent with the cited prior art itself, which provides that the conventional 2D browser is positioned *in the foreground of the 3D space*.”), 50 (“[W]hile a 2D browser may constitute ‘a window,’ it does not constitute ‘a window within a 2D space.’ In other words, the nature of the object (2D or 3D) does not define space.”), 51 (“[T]he mere existence of a 2D browser does not indicate the space with which it exists.”). Patent Owner does not clearly articulate the distinction it attempts to draw. However, as explained above, a browser defines a finite working 2D graphical area, and that area includes a window in which 2D webpages are displayed, which is all the Samsung court’s construction requires. Patent Owner does not explain persuasively, or support with evidence, that a browser with a 2D window, displaying a 2D webpage, does not define “a finite graphical area defined by a two-dimensional coordinate system,” as the District Court has construed the term. If it is Patent Owner’s position that a browser or a browser window is an object and not a 2D space (a position that Patent Owner has not made clear), Patent Owner has not supported that argument with persuasive evidence.

Petitioner responds that the embodiment described in the ’048 patent includes a 2D browser window within a virtual 3D space. Reply 3 (citing Ex. 1001, 21:45–47, 21:53–58). In this example,

the 3D GUI system utilizes the Bind to the HUD feature whereby clicking an icon or bottom (analogous to the minimize in windows operating system environment) triggers a change to the viewpoint of the end user within the virtual space so that the webpage is directly in an end user’s visual field, thereby

making it easier to interact with. *In one embodiment, this is accomplished by revealing the 2D version of the webpage that was initially hidden or drawn off screen and positioning it in a layer that is in front of the 3D virtual space such that the end user can interact with this layer in 2D.* Furthermore, the end user has the freedom to unbind to the hud or hide the 2D webpage again that was initially hidden or drawn off screen by clicking the appropriate button (again, analogous to the minimize button in the windows operating system environment). As such, an end user can toggle or switch between 2D and 3D for any selectively captured computing output and information (webpages, applications, documents, desktops or anything that can be visualized on a computer) that was drawn within a 3D virtual space at will by using this technique.

Ex. 1001, 21:39–58; *see also* Ex. 2010, 13 (citing Ex. 1001, 21:54–58). We agree with Petitioner that this example describes a 2D space (here, a browser window in front of the 3D virtual space that allows the user to interact with a 2D version of a webpage, which corresponds to “a finite graphical area defined by a two-dimensional coordinate system”) displayed within a 3D space (here, the 3D virtual space, which corresponds to “a virtual space defined by a three-dimensional coordinate system”). To the extent Patent Owner asks us to construe “2D space” to exclude a 2D browser window presented in front of a 3D virtual space, that argument is unpersuasive. *See Sequoia Tech., LLC v. Dell, Inc.*, 66 F.4th 1317, 1327 (Fed. Cir. 2023) (“The Federal Circuit “recognize[s] that ‘[a] claim construction exclud[ing] a preferred embodiment is rarely, if ever correct.’” (quoting *Kaufman v. Microsoft Corp.*, 34 F.4th 1360, 1372 (Fed. Cir. 2022) (second and third alterations in original)).

The District Court’s constructions of “3D space” and “two-dimensional (2D) space” are supported by the language of the claims and the

description in the specification. Accordingly, we accept the parties’ agreement and adopt the District Court’s constructions of these terms. The District Court’s construction of “two-dimensional (2D) space” does not exclude a conventional web browser displaying a 2D webpage in its window, and we see no sound basis to import such a limitation into the term. We reject Patent Owner’s attempt to further construe “2D space” or exclude embodiments from the District Court’s construction of that term.

We note that, prior to institution, Patent Owner argued that “replacing the first and second objects within the 3D space with a window within a two-dimensional (2D) space” requires “switching from a 3D environment, where only images are presented, to a 2D environment, where only one active application is presented for interaction.” Prelim. Resp. 42. We understood Patent Owner’s argument to be that claim limitation 1dii requires replacing the 3D space with a 2D space in its entirety. Inst. Dec. 42. We rejected that argument and explained that, according to the plain language of this limitation, “[o]nly the *objects* in the 3D space are required to be replaced and only by a *window* within a 2D space.” *Id.* Thus,

The claim does not appear to require replacement of the entire 3D environment with a 2D space, and Patent Owner does not explain why such a replacement is required. As long as first/second images within the 3D space are replaced by a window within a 2D space (e.g., a webpage), the limitation would appear to be met.

Id. We do not understand Patent Owner to be maintaining its argument that claim 1 requires entirely replacing the 3D space with a 2D space. Sur-reply 20 (“PO does not argue that the claims require ‘replacing’ a 3D space with a 2D space (Reply at 2) but ***replacing images (textured on objects) within 3D***”).

space with a window (including the rendered first webpage) within 2D space.”). In any case, the record does not support such an argument.

2. *Alleged chronological order*

Claim 1 recites “receiving at least first and second inputs from an end user,” “receiving first and second webpages from at least one server in response to said first and second inputs,” “rendering the first and second webpages,” “capturing first and second images,” and “texturing the first image on the first object and the second image on the second object, the first object being displayed in a foreground of the 3D space and the second object being displayed in a background of the 3D space.” Independent claims 8 and 14 include similar recitations.

Patent Owner argues that “in the claimed GUI, images are not just placed in 3D space but arranged in a particular, chronological order. The claims specify that this is done by arranging the images *in the order in which the webpages were requested by the user.*” PO Resp. 3; *see also id.* at 40 (“This is done by arranging the images *in the order in which the webpages were requested by the user.*”). According to Patent Owner,

This can be seen in Claim 1 where, in response to receiving a *first input* (or first website address) from the user, a *first webpage* is received and rendered, from which a *first image* is captured and textured onto a *first object*, which is presented in a *foreground of the 3D space*. In response to a *second input* (or second website address) from the user, a *second webpage* is received and rendered, from which a *second image* is captured and textured onto a *second object*, which is displayed in a *background of the 3D space*.

Id. at 40 (internal citations omitted). In the Sur-reply, Patent Owner argues that “[t]he Challenged Claims recite a specific order in which objects are

presented in 3D space.” Sur-reply 2–3. For example, “[a]ll of the claims . . . recite the terms ‘first’ and ‘second’ and antecedent bases.” *Id.* at 5.

According to Patent Owner, a person of ordinary skill in the art “would have understood that this claim language recites a specific arrangement where the first requested webpage (or image thereof) is displayed in the foreground and the second requested webpage (or image thereof) is displayed in the background.” *Id.*

Petitioner points out that “the numerical terms ‘first’ and ‘second’ used throughout the claims ‘should not in and of itself impose a serial or temporal limitation.’” Reply 9 (quoting *3M Innovative Props. Co. v. Avery Dennison Corp.*, 350 F.3d 1365, 1371 (Fed. Cir. 2003)). We agree with Petitioner and find that the plain language of claim 1 does not suggest that “first” and “second” establish a chronological order. “First” and “second” are used throughout claim 1 as identifiers to distinguish one from another, and the claim itself does not specify the points in time at which inputs are received relative to others or when images are rendered, captured, and textured relative to others. And aside from stating that the first object is displayed in the foreground while the second object is displayed in the background, the claim does not limit the form of visual presentation. The plain language of the claim does not specify whether the “first” object displayed in the foreground was rendered, captured, and/or textured before other objects displayed in the background.

According to the Federal Circuit,

As a general rule, “[u]nless the steps of a method [claim] actually recite an order, the steps are not ordinarily construed to require one.” *Interactive Gift Express, Inc. v. Compuserve Inc.*, 256 F.3d 1323, 1342 (Fed. Cir. 2001) (citation omitted).
However, a claim “requires an ordering of steps when the claim

language, as a matter of logic or grammar, requires that the steps be performed in the order written, or the specification directly or implicitly requires” an order of steps. *TALtech Ltd. v. Esquel Apparel, Inc.*, 279 Fed. Appx. 974, 978 (Fed. Cir. 2008)

Mformation Techs., Inc. v. Research in Motion Ltd., 764 F.3d 1392, 1398–99 (Fed. Cir. 2014). In one example, “[a]s a matter of logic, a mailbox must be established before the contents of said mailbox can be transmitted.” *Id.* at 1400. In this case, the “rendering” step of claim 1 must occur after the “receiving” inputs and “receiving” webpages, for example, as there must be something to render. However, nothing in the language of the claims suggests that the first webpage must be rendered before the second webpage, as the rendering of the second webpage does not rely on the first webpage having been already rendered.

Patent Owner argues that claim 6 confirms the specific chronological order it wishes to impose on the claims, because the third webpage is displayed on a third object in a further background of the 3D space, behind the second object. Sur-reply 5–6. Claim 6 recites no more than the visual position of the third object relative to the first and second objects. It says nothing about when the third webpage was received, rendered, textured, etc., relative to the first and second webpages. Thus, claim 6 does not support importing Patent Owner’s proposed chronological order into the claims.

Patent Owner points to examples in the ’048 patent where HTML pages entered by a user are represented by a 3D stack, which Patent Owner argues represents a visual chronological history of the user’s computing session. PO Resp. 7–10 (citing Ex. 1001, 2:14–20, 2:62–63, 5:6–13, 17:45–54, 20:15–32, 22:15–16, 25:55–59, 29:23–38, Fig. 11); Sur-reply 3–4 (citing Ex. 1001, 5:6–13, 29:23–38, Fig. 11). According to Patent Owner, “[t]he

claimed order is not only consistent with the specification but required to create a ‘3D GUI [that] can function as a visual chronological history of the user’s computing session.’” Sur-reply 6 (citing Ex. 1001, 5:6–21, 29:23–38, Figs 11, 4B (items 202, 206); Ex. 2014 ¶¶ 37–40). For example, the ’048 patent explains:

The system as a default draws each new webpage in what we call a “3D stack” (i.e., a stack visualized in 3D, sometimes referred to as a 3D stack) as shown where each new webpage occupies an x,y,z coordinate similar to the position of the existing webpage; except it is drawn further into the distance along the z axis (where it appears smaller from the given perspective) and is translated on the x or y or both x, y axis to allow the end user to see multiple webpages from any given perspective.

Ex. 1001, 17:45–54. However, the ’048 patent describes this feature in terms of embodiments and examples, and Patent Owner does not point to any indication that the claims should be limited to these examples. *See Best Med. Int’l, Inc. v. Elekta Inc.*, 46 F.4th 1346, 1355 (Fed. Cir. 2022) (“While [the patent owner] cites to a passage from the written description describing a specific embodiment that supports its proposed construction, we do not ‘limit[] claims to a preferred embodiment.’” (quoting *Comaper Corp. v. Antec, Inc.*, 596 F.3d 1343, 1348 (Fed. Cir. 2010))).

In sum, we do not find sufficient support within the intrinsic record to justify imposing an additional chronological or temporal limitation into the claims based on the terms “first” and “second” in claim 1 (and similar instances in claims 8 and 14); rather, those terms are used as identifiers to distinguish between similar things (e.g., webpages).

3. “*the rendered first webpage*”

Claim limitation 1dii recites “replacing the first and second objects within the 3D space with a window within a two-dimensional (2D) space in response to receiving the interaction, wherein the window includes *the rendered first webpage*.” Petitioner does not propose a construction for the term “the rendered first webpage” in the Petition. Pet. 13–14. Nevertheless, Patent Owner contends in the Patent Owner Response that “‘the rendered first webpage’ is the webpage that was requested by the user via the ‘first input’ from which the ‘first image’ was captured.” PO Resp. 13. As Petitioner summarizes, “[a]ccording to Patent Owner, ‘the rendered first webpage’ presented in 2D space ‘is the version that was previously received and rendered (e.g., stored in memory) from which the first image was captured. It is not a ‘live’ webpage from the Internet.’” Reply 6. Despite not proposing a construction in the Petition, Petitioner, in the Reply, asks us to construe “the rendered first webpage” to include either the previously received and rendered first webpage or a new (so called “live”) version of the first webpage rendered in response to receiving the user interaction of claim limitation 1dii. Reply 6–7.

The plain and ordinary meaning of claim 1 supports Patent Owner’s argument. “To begin with, the context in which a term is used in the asserted claim can be highly instructive.” *Phillips*, 415 F.3d at 1314 (“To take a simple example, the claim in this case refers to ‘steel baffles,’ which strongly implies that the term ‘baffles’ does not inherently mean objects made of steel.”). Here, claim 1 refers to replacing the first and second objects with “the rendered first webpage,” which implies that the objects are not replaced with just any version of the first webpage. “Rendered” is in the

past tense, suggesting a webpage that previously has been rendered. This is a clear reference to limitation 1ci, “rendering the first and second webpages.”

Dr. Fuchs’ testimony is instructive. According to Dr. Fuchs, a skilled artisan “would have known that webpage rendering was a ubiquitous process for converting raw HTML code received from a web server into visible content.” Ex. 1003 ¶ 104. According to Dr. Fuchs, “[w]ebpage rendering is a core functionality of virtually all web browsers, and it would have been obvious to a [person of ordinary skill in the art] that rendering is a prerequisite step to obtaining ‘screen snapshots of actual web pages,’ as explained in Robertson’s companion Data Mountain paper.” *Id.* ¶ 105 (citing Ex. 1030, 5). Dr. Fuchs testifies that a skilled artisan “would have understood that Robertson’s 3D-GUI *captures images* of the rendered (**first/second**) **webpages** to obtain the webpage images on the object thumbnails.” *Id.* ¶ 107. Similarly, Dr. Fuchs testifies that “Gettman’s technique involves ‘cach[ing]’ ‘bitmap screenshots’ (*captured first/second images*) of rendered (**first/second**) **webpages** in local memory.” *Id.* ¶ 108.

Here, as Dr. Fuchs reads claim limitations 1ci and 1cii, in step 1ci, a webpage is converted from raw HTML code into visible content, i.e., it is rendered. *Id.* ¶¶ 104–105. A portion of that rendered webpage, a particular version of that page previously processed and now in the form of visible content, is then captured in step 1cii to obtain an image (a thumbnail) to texture onto the first object. *Id.* ¶¶ 107–108. Petitioner argues that “the rendered first webpage” is simply a reference to “receiving first and second webpages,” “displaying at least a portion of the first webpage,” and “rendering the first and second webpages,” and that “[n]one of these recitations require different ‘versions’; just ‘the first webpage.’” Reply 6–7.

However, according to Dr. Fuchs’ testimony, the “capturing” and “texturing” steps of limitations 1cii and 1ciii do require the prerequisite step of rendering a particular version of the first webpage; thus, they require the version of the first webpage rendered in the “rendering” step of limitation 1ci. Thus, while we agree with Petitioner that claim 1 does not recite “the rendered ***old version of*** the first webpage,” the “rendered first webpage” is the “old version” of the first webpage rendered, captured, and textured in other steps of claim 1, and not the new “live” version. Moreover, if “the rendered first webpage” were simply a reference to the first webpage generally, “rendered” would be superfluous, as “the first webpage” would identify that webpage generally.

The specification of the ’048 patent is consistent with the ordinary meaning of claim 1. The specification describes an example in which the 3D GUI system utilizes the Bind to the HUD feature whereby clicking an icon or bottom (analogous to the minimize in windows operating system environment) triggers a change to the viewpoint of the end user within the virtual space so that the webpage is directly in an end user’s visual field, thereby making it easier to interact with. In one embodiment, *this is accomplished by revealing the 2D version of the webpage that was initially hidden or drawn off screen and positioning it in a layer that is in front of the 3D virtual space* such that the end user can interact with this layer in 2D.

Ex. 1001, 21:39–49 (emphasis added). Here, objects within the 3D space are replaced with “the 2D version of the webpage that was initially hidden or drawn off screen.” This is the “old” version, and not the “current” or “live” version of the webpage, to use Petitioner’s designations. PO Resp. 13 (citing Ex. 1001, 21:45–47). Petitioner argues that “the notion of different webpage ‘versions’” is “absent from the specification.” Reply 7. However, Petitioner does not address Patent Owner’s reference to the specification,

which does introduce the notion of different webpage versions. Ex. 1001, 21:39–49. Petitioner does not point to examples in the specification that support its position.

Upon consideration of the plain language of claim 1 and the description in the specification, we agree with Patent Owner that “the rendered first webpage,” as recited in claim 1, is “not referring to the webpage generally, but ***the rendered version from which the corresponding image was captured.***” Sur-reply 11.

4. Remaining claim terms

Based on the record before us, we do not find it necessary to provide express claim constructions for any other terms. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (noting that “we need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy’”) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

B. Obviousness over Robertson, Gralla, and Gettman

Petitioner argues that claims 1–18 would have been obvious over Robertson, Gralla, and Gettman. Pet. 3, 14–54.

A claim is unpatentable under pre-AIA 35 U.S.C. § 103(a) “if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” We resolve the question of obviousness on the basis of underlying factual determinations, including (1) the scope

and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) objective evidence of nonobviousness, i.e., secondary considerations. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

1. Level of Ordinary Skill in the Art

Petitioner contends that a skilled artisan would have had “a bachelor’s degree in computer science or a comparable field and at least two years of professional experience working with 2D and 3D graphical user interfaces,” and that “[a]dditional years of experience could substitute for an advanced-level degree (and vice versa).” Pet. 13 (citing Ex. 1003 ¶¶ 28–29) (citations omitted). Patent Owner “generally agrees” with this definition. PO Resp. 19.

Petitioner’s proposed definition is consistent with that reflected by the prior art of record and we adopt it for purposes of this Decision. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995); *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978).

2. Scope and Content of the Prior Art

a. Overview of Gettman (Ex. 1006)

Gettman relates to “a method of organizing and displaying a large volume of material content in a manner that can be easily browsed and accurately navigated by a viewer.” Ex. 1006 ¶ 44.

Figure 1 of Gettman is reproduced below:

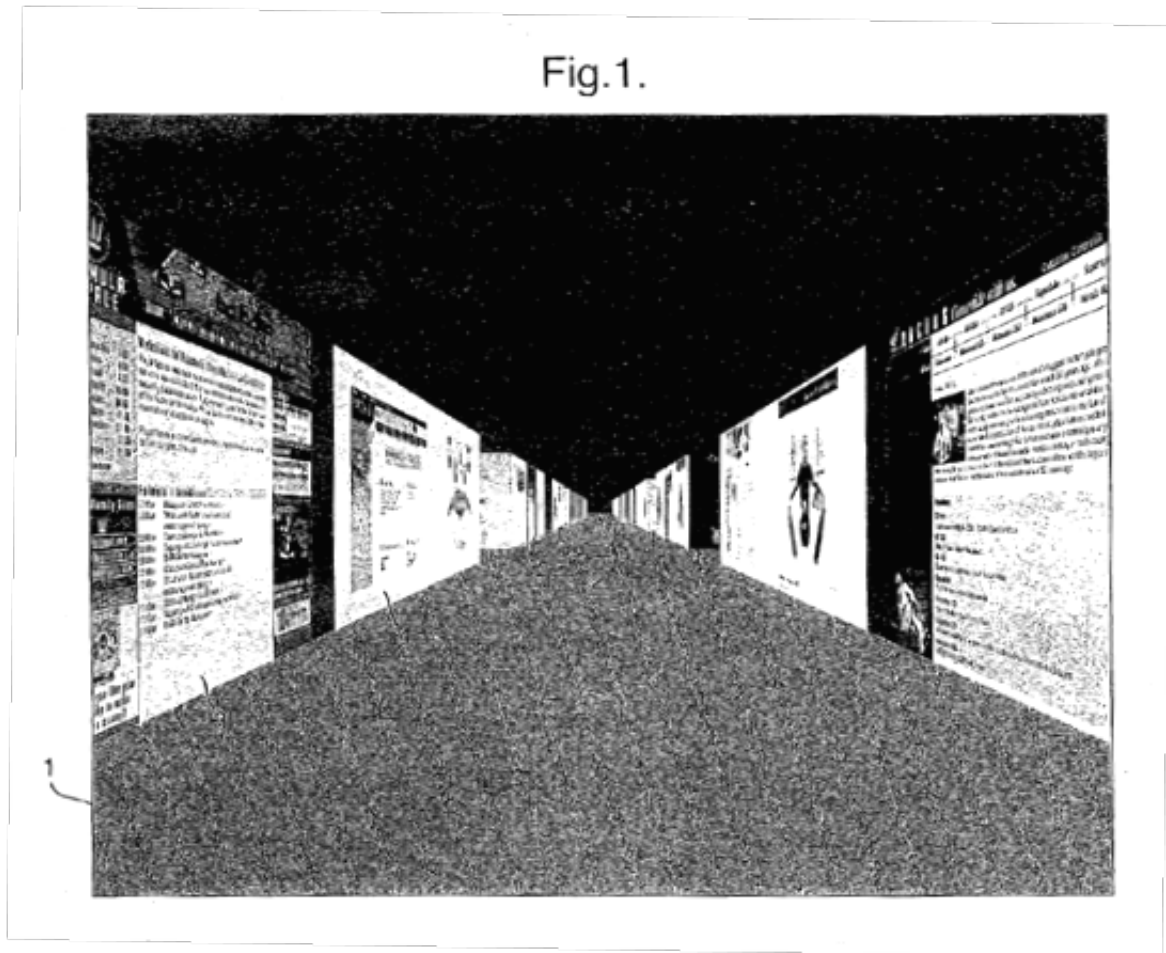


Figure 1 is a diagram of a screen. *Id.* ¶ 9. Figure 1 shows virtual street 2 with buildings 3 having virtual display windows 4.

Figure 1 shows “an image of a virtual street 2 seen in three-dimensional perspective from the middle of the street,” where “[b]uildings 3 are located on each side of the street 2, and each has one or more virtual display windows 4 facing the street 2.” *Id.* ¶ 76. Each window 4 may show content from “an Internet HTML page,” and “[t]hese may be the home pages of commercial concerns or pages specifically generated for display in this format.” *Id.* “As a viewer ‘moves’ along the street, distant windows come into view and close-by ones pass out of sight ‘behind’ the viewer,” with “the program carefully select[ing] the set of HTML pages to cache and store in

memory to ensure a smooth and fast appearance of rendered display windows.” *Id.* ¶ 84. However, in one example, a “page is not rendered dynamically until the viewer turns toward it (and ‘clicks’ on it or remains in that position for a set period of time), at which stage the dynamically cached page may be displayed in a two-dimensional, conventional-style browser display box.” *Id.* ¶ 83.

b. Overview of Gralla (Ex. 1005)

Gralla is a book titled “How the Internet Works,” and is aimed at professionals and novices alike. Ex. 1005, 12. In a section titled “How the World Wide Web Works,” Gralla explains the basics of how a Web browser sends a URL request in order to retrieve a page, document, or object from a Web server. *Id.* at 134.

c. Overview of Robertson (Ex. 1004)

Robertson relates to “[a] graphical user interface in which object thumbnails are rendered on a simulated three-dimensional surface which (i) exploits spatial memory and (ii) allows more objects to be rendered on a given screen.” Ex. 1004, code (57).

Figure 8A of Robertson is reproduced below:

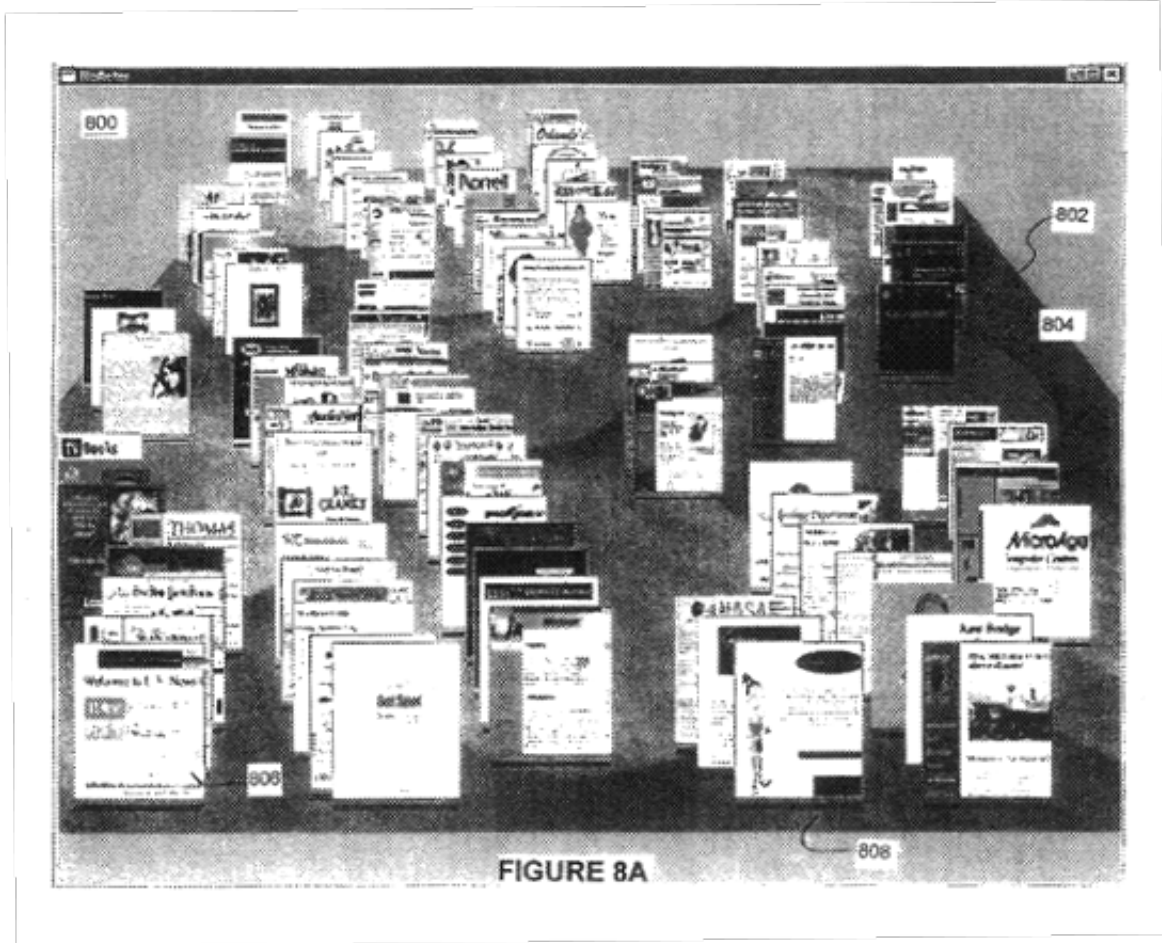


Figure 8A depicts a display of webpage thumbnails using a user interface. *Id.* at 8:4–5. Display 800 illustrates inclined plane 802 as having “low resolution images . . . or object thumbnails 806,” where “object thumbnails 806 represent web (or hypertext markup language or ‘HTML’) pages. *Id.* at 12:58–65.

Figure 9 is reproduced below:

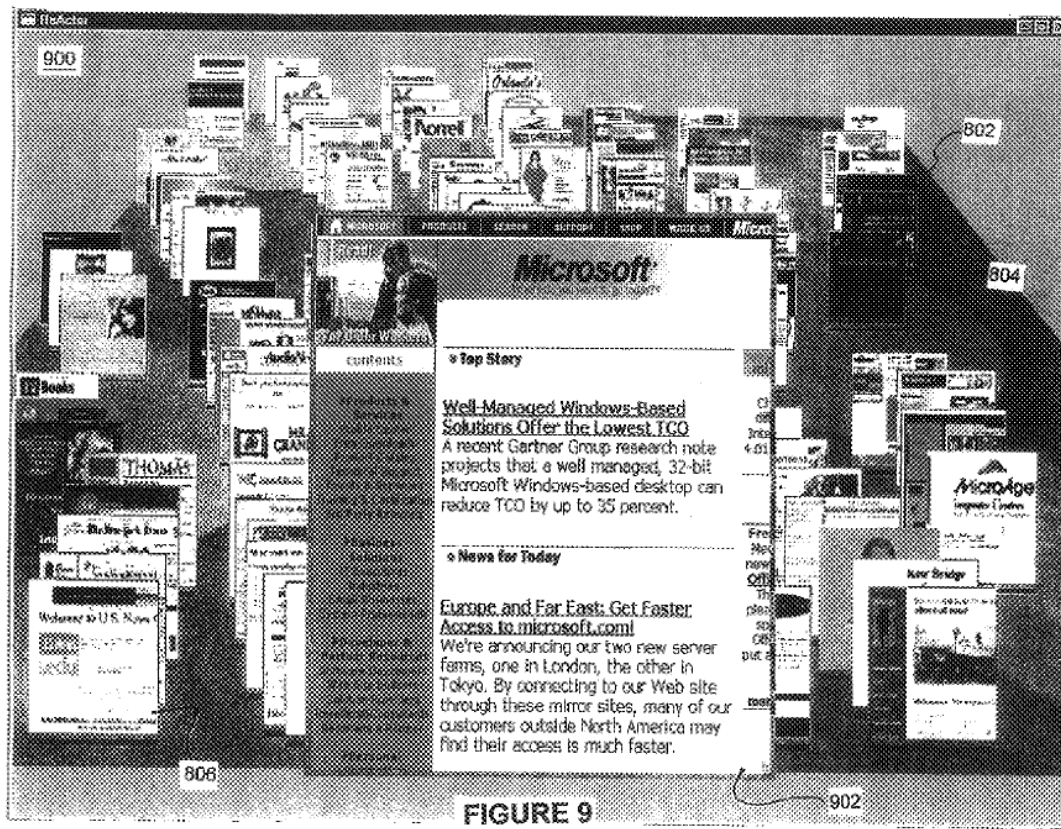


Figure 9 depicts a display showing a selected webpage using a user interface. *Id.* at 8:9–10.

Selected object thumbnail 902 in display 900 may be “displayed in a preferred viewing position, in this case, at the center foreground of the three-dimensional environment.” *Id.* at 13:58–62. Here, “selected object thumbnail 902 is a high resolution bit map,” which may be an instance of a browser application “rendering a web page, with the user interface of the present invention in the background.” *Id.* at 13:62–14:4.

3. *Claims 1–13*

Petitioner contends that the combination of Robertson, Gralla, and Gettman would have rendered claim 1 obvious. *See* Pet. 25–44.

Petitioner contends that, if the preamble of claim 1 is limiting², Robertson teaches providing a 3D-GUI. Pet. 25 (citing, *inter alia*, Ex. 1004, 6:30–31 (“The present invention provides a user interface, and in particular a graphical user interface . . . a simulated three-dimensional environment on the user’s video monitor.”)). We agree, and find that Robertson teaches the preamble of claim 1.

As to claim limitation 1a, Petitioner contends that Gralla shows a web browser receiving inputs from an end user when, for example, a “user ‘type[s] the URL for a location [they] want to visit’” in an address bar. *Id.* at 26–27 (citing Ex. 1005, 134; Ex. 1003 ¶ 93). Dr. Fuchs testifies that a person of ordinary skill in the art “would have understood and found it obvious that a user would visit multiple Internet locations (e.g., webpages and websites) during one or more browsing sessions and, accordingly, provide multiple (first/second) uniform resource locator (URL) inputs. Any person who has used the Internet can attest to this indisputable fact.” Ex. 1003 ¶ 93; Pet. 26–27. We agree, and find that Gralla teaches receiving at least first and second inputs from an end user.

As for a 3D-GUI “receiving at least first and second inputs from an end user,” Petitioner contends that a skilled artisan would have “integrate[d] Robertson’s 3D-GUI into the web browser described by Gralla as an

² For purposes of this Decision, we need not determine whether the preamble is limiting, as Petitioner’s evidence is sufficient to show that Robertson teaches the preamble if it is limiting.

upgrade to the conventional bookmark/favorites tools for revisiting webpages.” Pet. 18 (citing Ex. 1003 ¶¶ 71–21). Dr. Fuchs testifies that “extensive development on 3D-GUIs and webpage revisitation tools took place long before the ’048 patent, and those of skill in the art had already integrated these lines of development to create new and improved 3D-GUIs for web browsers.” Ex. 1003 ¶ 71. According to Dr. Fuchs, “the integration of Robertson and Gralla tracks the broad development trends in the prior art.” *Id.* Petitioner further argues that “Robertson makes clear that its 3D-GUI is an improvement over the ‘Favorites’ tool employed in Microsoft’s Internet Explorer, a featured web browser in Gralla.” Pet. 18–19 (citing Ex. 1004, 3:55–4:3; Ex. 1005, 133–34). According to Petitioner, Robertson notes downsides of the hierarchical lists used in this “Favorites” tool. *Id.* at 20 (referring to Ex. 1004, 3:55–4:3). To overcome this, Petitioner argues, Robertson “propos[es] its 3D-GUI as a needed improvement . . . expressly encourag[ing] the [person of ordinary skill in the art] to combine the teachings of Robertson and Gralla” and thereby arrive at a 3D-GUI “receiving at least first and second inputs from an end user,” as recited in limitation 1a. *Id.* (citing Ex. 1004, 6:15–67, 9:14–50; Ex. 1003 ¶¶ 74–76). Petitioner contends that a skilled artisan would have had a reasonable expectation of success in combining the teachings of Robertson and Gralla because GUIs, web browsers, and simulated 3D environments were all well-known technologies that had been successfully demonstrated in the real world. Pet. 25 (citing Ex. 1003 ¶ 90).

We credit Dr. Fuchs’ testimony and find that a skilled artisan would have had reasons, with rational underpinning, to combine the teachings of Robertson and Gralla, and would have had a reasonable expectation of success in doing so. Patent Owner argues generally that “in support of their

obviousness Grounds, Petitioners offered only vague and conclusory assertions concerning the alleged motivations to combine references and a person of ordinary skill in the art[’s] . . . reasonable expectation of success in doing so.” PO Resp. 4. However, Patent Owner does not present arguments specific to this ground and, instead, appears to limit this argument to the combination of Sauve and Tsuda (which we discuss below). *Id.* at 4–5. In any case, we do not find Petitioner’s proposed reasons to combine Robertson and Gralla vague and conclusory.

As to limitation 1b, Petitioner contends that Gralla teaches a user typing “URLs (website addresses corresponding to webpages) into the address bar of a web browser.” Pet. 27 (emphasis omitted) (citing Ex. 1005, 134, 163; Ex. 1003 ¶ 96). According to Petitioner, this satisfies the part of limitation 1b calling for “wherein the first and second inputs are website addresses corresponding to said first and second webpages.” *Id.* For “receiving first and second webpages from at least one server in response to said first and second inputs,” as recited in limitation 1b, Petitioner argues that the typical sending of a URL request to a server, whereupon the requested webpage is found and then sent to the browser, as taught by Gralla, satisfies the limitation. *Id.* at 27–28 (citing Ex. 1005 ¶¶ 134, 163; Ex. 1003 ¶¶ 96–97). We agree, and find that Gralla teaches claim limitation 1b.

As to claim limitation 1c, Petitioner contends that Robertson’s Figure 8A illustrates “displaying [via display 800] at least a portion of the first webpage on a first object within a 3D space, and at least a portion of the second webpage on a second object within the 3D space.” *Id.* at 29–30 (citing Ex. 1004, 12:54–63; Ex. 1003 ¶ 100). Petitioner argues that, in the combination of Gralla and Robertson, “the *first/second object* thumbnails of

Robertson represent the *first/second webpages* of Gralla (per Element [1.b]),” and that “Robertson evinces that the *object* thumbnails comprise visual representations—images (*displaying at least a portion*)—of the *webpages*.” *Id.* at 30 (citing Ex. 1004, 6:30–50, 9:10–35, 12:54–13:4, 18:1–5, 28:1–16, Figs. 2, 4, 8A–18; Ex. 1003 ¶¶ 101–102). We agree, and find that Gralla and Robertson teach claim limitation 1c.

As to claim limitation 1ci, “rendering the first and second webpages,” Petitioner contends that a skilled artisan “would have understood that Robertson’s 3D-GUI *renders the (first/second) webpages* to obtain the webpage images on the object thumbnails,” and that a skilled artisan “would have known that webpage *rendering* was a ubiquitous process for converting code received from a web server into visible content.” Pet. 31 (citing Ex. 1004, 6:30–50, 9:10–35, 12:54–13:4, 18:1–5, 28:1–16, Figures 2, 4, 8A–18; Ex. 1003 ¶¶ 104–105). Dr. Fuchs testifies that “[w]ebpage *rendering* is a core functionality of virtually all web browsers, and it would have been obvious to a [person of ordinary skill in the art] that rendering is a prerequisite step to obtaining ‘screen snapshots of actual web pages,’ as explained in Robertson’s companion Data Mountain paper.” Ex. 1003 ¶ 105 (quoting Ex. 1030).

Petitioner further argues that a skilled artisan would have applied “implementation details provided by Gettman for displaying webpages in a 3D-GUI” to Robertson’s disclosure of object thumbnails displaying webpage images. Pet. 31. Petitioner contends that “Gettman’s technique involves ‘cach[ing]’ ‘bitmap screenshots’ of *webpages* in local memory using a ‘HTML page-*rendering* engine’—a software application for *rendering (the first/second) webpages*.” *Id.* at 31–32 (citing Ex. 1006 ¶¶ 82, 108–121, Fig. 2; Ex. 1003 ¶ 106).

Relying on Dr. Fuchs’ testimony, Petitioner contends that a skilled artisan would have substituted Gettman’s browser-window technique for Robertson’s to obtain the predictable benefit of improved usability. *Id.* at 24 (citing Ex. 1003 ¶¶ 87–88). Petitioner further argues that this combination would have been the predictable substitution of one element known in the field for another. *Id.* (citing Ex. 1003 ¶ 89). Petitioner contends that a skilled artisan would have had a reasonable expectation of success in combining the teachings of Robertson, Gralla, and Gettman because GUIs, web browsers, and simulated 3D environments were all well-known technologies that had been successfully demonstrated in the real world. *Id.* at 25 (citing Ex. 1003 ¶ 90).

We credit Dr. Fuchs’ testimony and find that a skilled artisan would have had reasons, with rational underpinning, to combine the teachings of Robertson and Gralla with those of Gettman, and would have had a reasonable expectation of success in doing so. As noted above, Patent Owner does not present arguments specific to the reasons to combine Robertson, Gralla, and Gettman. PO Resp. 4–5.

As to claim limitation 1cii, Petitioner argues that a skilled artisan “would have understood that Robertson’s 3D-GUI *captures images* of the rendered (*first/second*) *webpages* to obtain the webpage images on the object thumbnails.” Pet. 32 (citing Ex. 1004, 6:30–50, 9:10–35, 12:54–13:4, 18:1–5, 28:1–16, Figs. 2, 4, 8A–18; Ex. 1003 ¶ 107). Petitioner further argues that “Gettman’s technique involves ‘cach[ing]’ ‘bitmap screenshots’ (*captured first/second images*) of rendered (*first/second*) *webpages* in local memory.” *Id.* at 33 (citing Ex. 1006 ¶¶ 82, 108–121; Ex. 1003 ¶ 108). We agree, and find that Robertson and Gettman teach claim limitation 1cii.

Regarding claim limitation 1ciii, Petitioner argues that “Robertson’s figures [8A and 15A] demonstrate how the webpage *images* are drawn/mapped based on the size and shape of the *object* thumbnail—e.g., larger in the foreground, smaller in the background, and optionally with a parallax effect.” Pet. 33–35 (citing Ex. 1004, 6:30–50, 9:10–35, 12:54–13:4, 14:61–63, 17:49–67, 18:1–13, 28:1–16, Figs. 2, 4, 8A–18; Ex. 1003 ¶¶ 110–113). Petitioner concedes that “Robertson does not use the exact term [‘texturing’],” but argues that Gettman “confirms that a [person of ordinary skill in the art] would have understood Robertson’s technique to use *texturing*.” *Id.* at 35–36 (citing Ex. 1006 ¶¶ 112–121, 163, Fig. 6C; Ex. 1003 ¶ 114). We agree, and find that Robertson and Gettman teach claim limitation 1ciii.

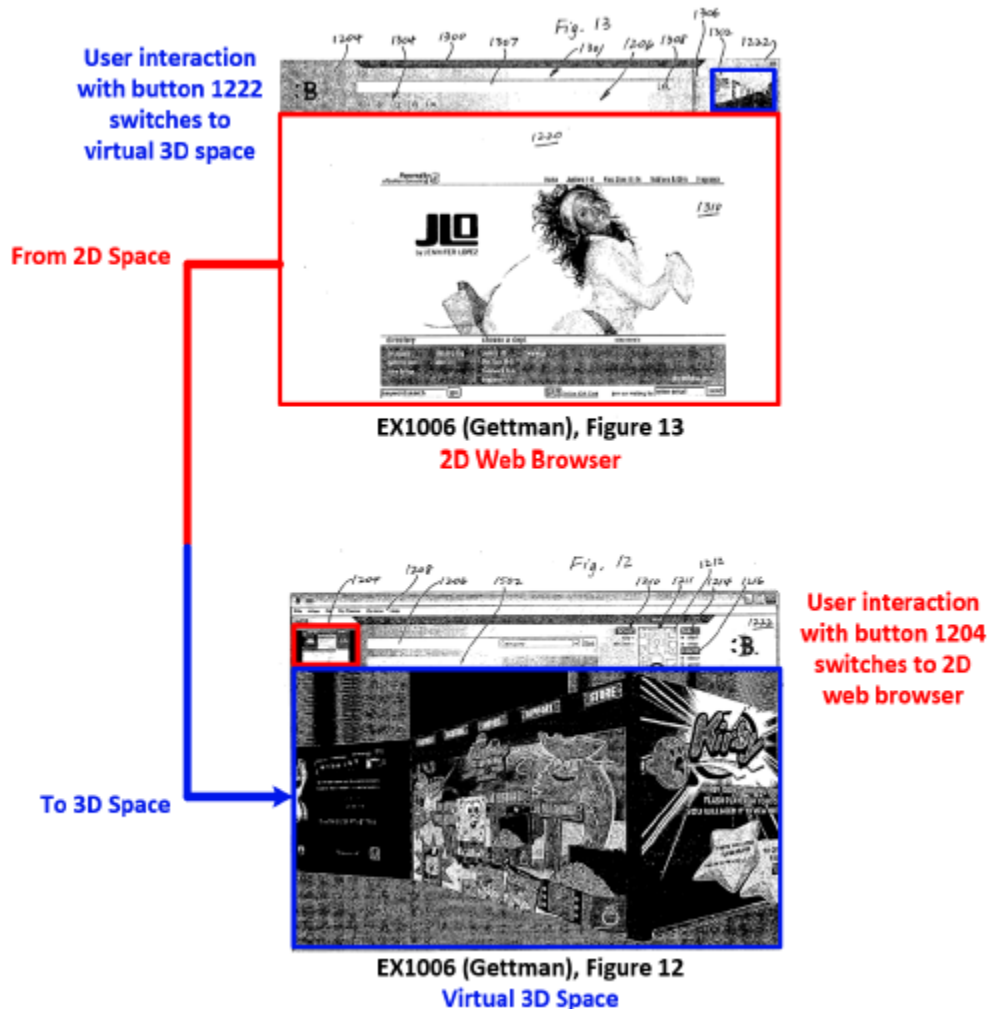
As to claim limitation 1di, Petitioner argues that, with Robertson’s 3D-GUI, an object is selected when an end user inputs, and the 3D-GUI receives, a predetermined interaction, such as a mouse click, on the first image of the object thumbnail. *Id.* at 39 (citing Ex. 1004, 13:55–14:21, 15:45–68, 16:3–17, Fig. 22; Ex. 1003 ¶ 122). We agree, and find that Robertson teaches claim limitation 1di.

Claim limitation 1dii recites “replacing the first and second objects within the 3D space with a window within a two-dimensional (2D) space in response to receiving the interaction, wherein the window includes the rendered first webpage.” The parties dispute several aspects of the applicability of the teachings of Robertson and Gettman to this limitation.

Petitioner contends that Robertson teaches this limitation because, when the user selects an object thumbnail, “Robertson’s 3D-GUI presents a “‘live’ object’ that is ‘in its associated application,’ such as ‘the Internet Explorer™ Internet browser . . . [for] rendering a [first] web page.’”

Pet. 39–40 (emphasis omitted) (quoting Ex. 1004, 13:55–14:14; citing Figure 9). According to Petitioner, in doing so, “the *(first/second) objects in the 3D space* of Robertson’s GUI are *replaced*—both from the user’s perspective of what content is viewable and the computer’s standpoint in terms of what content is being displayed—by a full-screen *window in the two-dimensional space* of a conventional Internet Explorer web browser.” *Id.* at 40 (citing Ex. 1003 ¶¶ 123–125).

Petitioner also relies on Gettman which, according to Petitioner, “describes an embodiment where ‘the result of the interaction [with a 3D display window in the virtual city] may cause the target [w]eb site to open in a conventional two-dimensional web browser.’” Pet. 40–41 (quoting Ex. 1006 ¶ 164; citing *id.* ¶¶ 200–201). Petitioner quotes Gettman as explaining that in this embodiment, “‘the user *switches* to an alternate two-dimensional view of the web page.’” *Id.* (Petitioner’s emphasis). Petitioner provides annotated versions of Gettman Figures 12 and 13, reproduced below, to illustrate that, when a user interacts with buttons, a 2D space (i.e., a 2D web browser (Fig. 13)) “switches” to a 3D space (i.e., a virtual 3D space (Fig. 12)). *Id.* at 41 (citing Ex. 1004 ¶ 200, Figs. 12, 13).



The figures above are Petitioner’s annotated versions of Gettman’s Figures 12 (bottom) and 13 (top) showing buttons 1204 and 1222, that, when interacted with, cause a 2D space (outlined in red) to switch to a 3D space (outlined in blue). According to Petitioner, a skilled artisan “would have been motivated to employ Gettman’s above-discussed teaching of toggling between ‘a virtual 3D space’ and ‘a two dimensional browser’ in response to an end user interacting with and selecting an object thumbnail.” Pet. 42 (citing Ex. 1003 ¶ 127).

Patent Owner argues that “the present invention requires both 2D and 3D space, where images of webpages are presented in 3D space and

replacing the images with a single, active webpage *in 2D space*, where the webpage is selected based on the user interacting with one of the images in 3D space.” PO Resp. 38. According to Patent Owner, this “**requir[es] both a 3D environment, where only images are presented, and a 2D environment, where only individual, active applications are presented for interaction.**” *Id.* at 39. Patent Owner argues that “[n]ot only does this require the user to go back-and-forth between 3D and 2D space, but it does so in way to (a) provide a visual chronological history of the user’s computing events and (b) present the webpage ***where the user last left off.***” *Id.* at 39–40.

As to a chronological order, Patent Owner argues that “images are not just arranged in 3D space but arranged in a particular order to provide ‘a visual chronological history of the user’s computing session.’ This is done by arranging the images *in the order in which the webpages were requested by the user.*” *Id.* at 40 (quoting Ex. 1001, 5:6–12). Patent Owner argues that “Robertson’s objects are not a ‘3D stack’ with a first image in the foreground, a second image in the background, etc., but arranged in ‘clusters’ where objects are arranged ‘relatively close to one another.’” *Id.* at 57 (quoting Ex. 1004, 7:24–33; citing Ex. 2014 ¶ 170).

Petitioner contends that Patent Owner’s arguments are moot because the claims do not require a 3D stack of objects arranged chronologically. Reply 19. We agree with Petitioner. As explained in the Claim Construction section above, the challenged claims do not require the chronological ordering proposed by Patent Owner. Accordingly, Patent Owner’s argument is not persuasive.

As to “replacing the first and second objects within the 3D space with a window within a two-dimensional (2D) space,” as recited in claim

limitation 1dii, Patent Owner argues that Robertson describes an example in which a user clicks on an object thumbnail presented in 3D space, and that object thumbnail is displayed in the foreground, still in 3D space. PO Resp. 42–43 (citing Ex. 1004, 13:55–14:10). However, Robertson describes another example in which, “rather than merely providing a high resolution object thumbnail, the actual object, in its associated application, may be presented.” Ex. 1004, 13:65–67. Patent Owner acknowledges that “Robertson provides that in one embodiment, the selected webpage may be presented in an Internet Explorer™ Internet browser in 3D space.” PO Resp. 43 (citing Ex. 1004, 13:64–14:10). Patent Owner argues that, even in this browser example, the browser “is still in 3D space,” as “supported by the fact that Robertson provides that when the browser is enlarged, the other objects (or images) are ‘in the background,’” and further supported by Robertson’s Figure 13B, “which provides that the selected object could be presented in the background (as opposed to the foreground) so as to not to occlude the other objects.” *Id.* at 43–44 (quoting Ex. 1004, 13:55–14:10; citing Ex. 1004, 22:39–43, Fig. 13B). According to Patent Owner, “[w]hile the ‘live’ object may appear as 2D in Figure 9, that is merely due to the user having a top-down viewpoint. If the user changes their viewpoint, the object appears more 3D.” *Id.* at 44–45 (citing Ex. 1004, 17:9–14, 22:39–43, Figs. 9, 13B; Ex. 2014 ¶ 83). Patent Owner appears to contend that Robertson’s browser window is a 2D object presented in a 3D space rather than a 2D space replacing objects within a 3D space. *Id.* at 45 (“However, whether the object is 2D or 3D is really a red herring as the challenged claims ***do not require a 2D object, but a 2D space.***”) (citing Ex. 2014 ¶ 83).

Robertson describes a user clicking on a thumbnail image and, in response, “rather than merely providing a high resolution object thumbnail,

the actual object, in its associated application, may be presented,” for example, “the Internet Explorer™ Internet browser . . . may be rendering a web page, with the user interface of the present invention in the background.” Ex. 1004, 13:58–14:4. We find that an Internet Explorer browser rendering a webpage in its window is “a finite graphical area defined by a two-dimensional coordinate system.” Thus, it is a 2D space, as we construe the term, as discussed above. It is not the “first object,” as recited in claim limitation 1c–1ciii (Robertson’s first object thumbnail, onto which an image of the first website is textured), as the object thumbnail is replaced with “the actual object, in its associated application,” such as the website rendered in a browser window. Patent Owner’s arguments to the contrary are not persuasive. Thus, we find that Robertson teaches “replacing the first . . . object[] within the 3D space with a window within a two-dimensional (2D) space,” as recited in claim limitation 1dii.

Patent Owner further argues that “Gettman is similar to Robertson in that objects are only presented in 3D space.” *Id.* at 47. Patent Owner acknowledges that, in one embodiment, Gettman’s “‘live’ webpage is presented in a conventional 2D browser, but it is still presented *in the 3D space*.” *Id.* (citing Ex. 1006 ¶¶ 83, 121, 128, 164). Gettman describes

When a window first becomes visible in the viewer’s screen, the corresponding cached HTML page is copied by the program from the internal memory and rendered in the window. The page is not rendered dynamically until the viewer turns toward it (and “clicks” on it or remains in that position for a set period of time), at which stage the dynamically cached page may be displayed in a two dimensional, conventional-style browser display box.

Ex. 1006 ¶ 83. In the example of Figure 6C, “the result of the interaction may cause the target Web site to open in a conventional two-dimensional

web browser which forms another ‘view’ within the virtual space browser[,]
ie.[,] [t]he content within the virtual space itself does not change as a result
of the interaction, but the user switches to an alternate two-dimensional view
of the web page.” *Id.* ¶ 164. These are examples of an image of a website
being textured on an object (display window 4, shown in Gettman’s Fig. 1;
display windows 644, 646 of Fig. 6C), and replaced with a browser
rendering the website corresponding to the image when the user selects
(clicks on a display window or “turns toward”) the object. We find that a
“two dimensional, conventional-style browser display box” rendering a
webpage is “a finite graphical area defined by a two-dimensional coordinate
system.” Thus, it is a 2D space, as we construe the term. As a result, we
find that Gettman teaches “replacing the first . . . object[] within the 3D
space with a window within a two-dimensional (2D) space,” as recited in
claim limitation 1dii.

As to “replacing the first and second objects,” as recited in claim
limitation 1dii, Patent Owner argues that Robertson’s browser window only
replaces the selected first object and not both the first and second objects.
PO Resp. 46 (citing Ex. 1004, 22:4–5; Ex. 2014 ¶ 86). Patent Owner
contends that Robertson teaches avoiding total preclusion of other objects
besides the first object being replaced. *Id.* at 46–47 (citing Ex. 1004, 9:65–
10:14, 17:39–40, 22:31–55, Figs. 13A–D; Ex. 2014 ¶ 88). Comparing
Robertson’s Figure 8 to Figure 9, however, clearly shows that multiple
objects are entirely occluded when an object is selected and window 902 is
invoked. Thus, we find that Robertson teaches replacing first and second
objects.

Moreover, Petitioner also cites Gettman as teaching replacing both the
first and second objects. Pet. 40–42; Reply 14–16. For example, in

Gettman’s example of Figure 6C, virtual display windows 644, 646 display textures rendered from webpages. Ex. 1006 ¶ 164. When a user interacts with a virtual display window, “the result of the interaction may cause the target Web site to open in a conventional two-dimensional web browser which forms another ‘view’ within the virtual space browser[,] ie.[,] [t]he content within the virtual space itself does not change as a result of the interaction, but the user switches to an alternate two-dimensional view of the web page.” *Id.* Gettman’s Figure 13 illustrates a “web view” that results when a hyperlink is selected by a user, causing the browser to display a view of a webpage in the main pane of the screen display area. *Id.* ¶ 200.

Patent Owner argues that Figure 13 is not the 2D browser that is presented when the user clicks on a window in 3D space and, instead, is a browser launched when a user clicks on the “web button area” of Figure 12. PO Resp. 48. To the extent Patent Owner is arguing that Gettman does not teach replacing all of the objects in a 3D space with a browser window rendering a selected webpage (which Patent Owner has not clearly articulated), we are not persuaded. Figure 13 is representative of a browser window that Gettman’s system invokes when a user clicks a hyperlink. Ex. 1006 ¶ 200. Clicking on a display window in Gettman’s Figure 1 or 6C invokes a 2D browser window. *Id.* ¶¶ 83, 164. We find that Figure 13’s example of a webpage rendered in a browser would also be applicable to the

examples of Figures 1 and 6C.³ Taken together, we agree with Petitioner, and find that Gettman teaches replacing the objects in a 3D space (Gettman’s virtual display windows in a virtual 3D street) with a browser window rendering the webpage selected by the user.

Patent Owner argues that “*Robertson’s use of a single 3D space actually teaches away from the claimed invention*, where the user goes back-and-forth between a plurality of images in 3D space and individual, active webpages in 2D spaces.” PO Resp. 49. “A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant.” *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994).

Specifically, Patent Owner argues that “Robertson is concerned with object occlusion, and how total preclusion of other objects presented in 3D space should be avoided.” PO Resp. 46–47 (citing Ex. 1004, 7:13–16, 9:65–10:14, 17:39–40, 22:31–55). Patent Owner argues that Robertson teaches that its 3D-GUI is advantageous in that it can present more objects at one time on a single display screen while preventing object occlusion. *Id.* at 48 (citing Ex. 1004, 5:62–67, 6:20–23, 6:65–67, 7:13–16, 22:20, 22:32–34, Figs. 20A–B; Ex. 2014 ¶ 87). Dr. Schaefer cites to further material in

³ The Preliminary Response contended that, in Gettman’s Figure 4 embodiment, “the ‘live’ webpage is presented in a conventional, 2D browser in 3D space.” Prelim. Resp. 46. To the extent that Patent Owner contends that Gettman’s Figure 4 illustrates selecting a virtual display window, but not entirely replacing the 3D space, we note that the 2D rendering of the webpage in the foreground of Figure 4 occludes more than one object and, thus, replaces at least first and second objects.

Robertson to show “that only the selected object is replaced” and “that Robertson discusses at length the issue of object occlusion, and how total preclusion of other objects presented in 3D space should be avoided.”

Ex. 1014 ¶ 87 (citing Ex. 1004, 5:47–49, 5:22–24, 7:13–17, 9:65–10:14, 17:39–40, 22:31–55, Figs. 13A–D, 23A–B). Thus, Patent Owner argues, a skilled artisan would not have modified Robertson to present a webpage in 2D space, “especially if doing so would result in the total occlusion of objects presented in 3D space.” *Id.* at 49–50.

Although Robertson states that it is advantageous to display more objects in a 3D landscape without one object thumbnail totally occluding another, and describes examples where selected objects do not occlude other objects, none of Patent Owner’s citations purports to discourage or lead in a direction divergent from a selected object replacing multiple objects. Moreover, as explained above, and contrary to Patent Owner’s arguments, Robertson depicts an example of occluding entirely objects displayed in Figure 8 when window 902 is invoked, as shown in Figure 9. Here, “the ‘mere disclosure of alternative designs does not teach away,’” and “just because better alternatives exist in the prior art does not mean that an inferior combination is inapt for obviousness purposes.” *In re Mouttet*, 686 F.3d 1322, 1334 (Fed. Cir. 2012) (quoting *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004); citing *Gurley*, 27 F.3d at 553). Thus, Robertson does not teach away from a combination with Gettman in which, when a user selects an object in a 3D space, a browser window is invoked, occluding multiple objects, or even the entire 3D space (and the first and second objects therein).

As to replacing the first and second objects within the 3D space with a window within a two-dimensional (2D) space “wherein the window includes

the rendered first webpage” of limitation 1dii, Patent Owner argues that both Robertson and Gettman teach that, when a user selects an object with an image of a webpage, and a web browser is invoked, the web browser renders the webpage anew and does not display the version of the webpage that was rendered previously in the step of claim limitation 1ci. PO Resp. 52–56.

We agree with Patent Owner’s characterization and find that it is correct. In Robertson, for example, “the Internet Explorer™ Internet browser . . . may be rendering a web page, with the user interface of the present invention in the background.” Ex. 1004, 13:55–14:4. Dr. Fuchs admits that Robertson operates in this manner:

when a user selects a thumbnail, “the Internet Explorer browser . . . render[s] [the corresponding] web page, with the [3D] user interface . . . in the background.” In other words, selecting the thumbnail causes Internet Explorer to retrieve, render, and display the webpage represented by thumbnail.

Ex. 1003 ¶ 65 (quoting Ex. 1004, 13:67–14:14). In Gettman,

When a window first becomes visible in the viewer’s screen, the corresponding cached HTML page is copied by the program from the internal memory and rendered in the window. The page is not rendered dynamically until the viewer turns toward it (and “clicks” on it or remains in that position for a set period of time), at which stage the dynamically cached page may be displayed in a two dimensional, conventional-style browser display box.

Ex. 1006 ¶ 83. Petitioner does not appear to dispute that this describes rendering the “current” or “live” webpage in response to the user’s selection. Reply 18–19.

Patent Owner contends that “wherein the window includes the rendered first webpage” “requires receiving a first input (or web address) from the user and, in response, receiv[ing] a first webpage, render[ing] the

first webpage, and captur[ing] a first image of the rendered first webpage, which is textured on a first object in 3D space.” PO Resp. 53. As explained in the Claim Construction section above, we agree with Patent Owner that “the rendered first webpage,” as recited in claim 1, is not referring to the webpage generally, but the rendered version from which the corresponding image was captured. Neither Robertson nor Gettman teaches “the window includes *the rendered first webpage*.”

Petitioner’s primary argument relies on us construing “wherein the window includes the rendered first page” to include the window presenting the “current” or “live” version of the webpage. Reply 6–8, 18. We reject that argument for the reasons given in the Claim Construction section, above.

Petitioner further argues that, if we adopt Patent Owner’s construction (which we do), that construction “reads on basic browser caching, a staple of the ‘conventional’ web browsers in the Robertson-Gettman combination.” *Id.* at 19. According to Petitioner, a skilled artisan “would have known [that] web browsers like Internet Explorer include a built-in browser cache that stores copies of previously retrieved webpages,” and the web browsers would have presented the stored copy to the user instead of retrieving a new copy. *Id.* (citing Ex. 1060 ¶¶ 78–80). Dr. Fuchs, in turn, relies on two new exhibits, Exhibits 1055 and 1056. Ex. 1060 ¶ 79.

First, to the extent Petitioner argues that this browser caching feature is present in the combination of Robertson, Gralla, and Gettman, Dr. Fuchs’ new testimony (Ex. 1060 ¶ 79), e.g., “[i]n some instances, such as when a webpage consists of static content that is ‘fresh’ (as opposed to ‘stale’), the browser presents the stored copy to the user without retrieving a new copy from the origin server,” is directly contradicted by the testimony he

submitted with the Petition (Ex. 1003 ¶ 65). Dr. Fuchs unequivocally testified that “selecting the thumbnail causes Internet Explorer to retrieve, render, and display the webpage represented by thumbnail.” Ex. 1003 ¶ 65. Thus, all of Dr. Fuchs’ testimony on this point, in both declarations, is inconsistent, unreliable, not credible, and entitled to little weight. Thus, Petitioner’s new theory is unsupported by evidence and not persuasive.

Even if we were to find Dr. Fuchs’ testimony credible, as Patent Owner observes (Sur-reply 11–12), Petitioner’s argument was not presented in the Petition and relies on new evidence (Exhibits 1055, 1056, and 1060 (new testimony from Dr. Fuchs)) that was not included in the Petition. This is contrary to our rules. *See* 37 C.F.R. § 42.23(b) (“A reply may only respond to arguments raised in the corresponding . . . patent owner response, or decision on institution.”). Specifically, “Petitioner may not submit new evidence or argument in reply that it could have presented earlier, e.g. to make out a *prima facie* case of unpatentability.” Consolidated Trial Practice Guide (“TPG”) at 73; *see also* 84 Fed. Reg. 64,280 (Nov. 21, 2019).

“Respond,” in the context of 37 C.F.R. § 42.23(b), does not mean proceed in a new direction with a new approach as compared to the positions taken in a prior filing. While replies and sur-replies can help crystalize issues for decision, a reply or sur-reply that raises a new issue or belatedly presents evidence may not be considered. The Board is not required to attempt to sort proper from improper portions of the reply or sur-reply.

Examples of indications that a new issue has been raised in a reply include new evidence necessary to make out a *prima facie* case for the patentability or unpatentability of an original or proposed substitute claim, such as newly raised rationale to combine the prior art references that was not expressed in the petition.

TPG 74. *See also Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F3d 1359, 1369 (Fed. Cir. 2016).

The Petition presented the theory that Robertson’s and Gettman’s descriptions of browser windows rendering webpages anew teach “wherein the window includes the rendered first webpage.” Pet. 39–42. The Petition did not argue that the browsers of Robertson and Gettman would, instead, present previously rendered and cached webpages in lieu of rendering those webpages. *Id.* Petitioner’s Reply argument is an attempt to present a new *prima facie* case of obviousness, i.e., that a skilled artisan would have known that web browsers such as those in Robertson and Gettman could present cached webpages and that it would have been obvious to do so when such pages are “fresh” and not “stale.” Reply 19. Tellingly, Petitioner does not cite to evidence presented with the Petition to support this new argument; rather, Petitioner introduces new expert testimony and supporting exhibits that supply the missing teachings of web browser caching. *Id.* (citing Ex. 1060 ¶ 79 (citing Exs. 1055, 1056)). Petitioner’s new argument and new testimony is improper, has been forfeited, and will not be considered.⁴

In sum, we find that neither Robertson nor Gettman teaches “replacing the first and second objects within the 3D space with a window within a two-dimensional (2D) space in response to receiving the interaction, wherein the window includes *the rendered first webpage*,” as recited in claim limitation 1dii.

⁴ Below, we address Patent Owner’s motion to exclude this new evidence, specifically Exhibit 1060 ¶ 79 and Exhibits 1055 and 1056, referenced therein, and find that motion moot.

This issue is dispositive for claim 1 and independent claim 8, which similarly recites “replacing the first and second objects within the 3D space with a window within a two-dimensional (2D) space on the display screen in response to receiving the interaction, wherein the window includes *the rendered first webpage*.” It also is dispositive for claims 2–7 and 9–13, which depend from claims 1 and 8, respectively. Nevertheless, we address the remaining limitations of claim 1, as it bears on the patentability of independent claim 14, as discussed in detail below.

As to claim limitation 1diii, Petitioner contends that Robertson “teach[es] the concept of launching a web browser (*e.g.*, Intern[et] Explorer or Mozilla) for the user to interact with in a conventional way—*i.e.*, in a 2D window instead of a virtual 3D space.” Pet. 42 (citing Ex. 1003 ¶ 128). Petitioner relies on Gralla for an explanation of the “conventional way”; that is, “the conventional functionalities of such a web browser involve ***receiving an interaction by the end user—a ‘click’—on a link provided in the rendered (first) webpage, the link corresponding to the additional information.***” *Id.* (citing Ex. 1005, 134). We agree with Petitioner that Robertson and Gralla teach receiving an interaction with a link, on a rendered webpage, to additional information. Thus, we find that Robertson and Gralla teach this aspect of claim limitation 1diii. However, as noted above for claim limitation 1dii, in Petitioner’s combination, the rendered webpage in the window within the 2D space is of the current or live version of the webpage, rather than the “rendered first webpage.” Thus, for the same reasons as given for claim limitation 1dii, the combination of Robertson, Gralla, and Gettman does not teach receiving an interaction on a link provided in “the rendered first webpage,” as recited in claim limitation 1diii.

As to claim limitations 1 div and 1 dv, Petitioner argues that Robertson “teach[es] the concept of launching a web browser (e.g., Intern[et] Explorer or Mozilla) for the user to interact with in a conventional way—i.e., in a 2D window instead of a virtual 3D space” and “Gralla explains that the conventional functionalities of such a web browser involve rendering and displaying the additional information.” *Id.* at 43–44 (emphasis omitted) (citing Ex. 1005, 142–43; Ex. 1003 ¶¶ 104–105, 129). We agree with Petitioner, and find that Robertson and Gralla teach claim limitations 1 div and 1 dv.

4. Claims 14–18

Independent claim 14 is similar in many respects to claim 1, and Petitioner and Patent Owner cite back to their arguments and evidence as to claim 1 for claim 14. Pet. 52–53; PO Resp. 57.

We agree with Petitioner (Pet. 52–53) that the evidence and argument Petitioner presents for claim limitations 1a–1 di and 1 div–1 dv are sufficient to show that Robertson, Gralla, and Gettman teach claim limitations 14a–14 di, and 14 div, for the reasons given above. Aside from arguing that the claims have a chronological order requirement, Patent Owner does not present separate arguments for these limitations. Like claim 1, claim 14 does not have Patent Owner’s proposed chronological order requirement. For the same reasons as given for claim 1, Patent Owner’s arguments on this point (PO Resp. 40–41, 56–58; Sur-reply 2–7) are not persuasive.

Claim limitation 1 dii recites “replacing the first and second objects within the 3D space with a window within a two-dimensional (2D) space in response to receiving the interaction, wherein the window includes the

rendered first webpage.” Claim limitation 1diii recites “receiving an interaction by the end user on a link provided in the *rendered* first webpage, the link corresponding to the additional Information.” As explained above, Petitioner has not shown that Robertson, Gralla, and Gettman teach these limitations of claim 1, in particular, that the window includes the “rendered” first webpage.

Claim limitation 14dii is similar to claim limitation 1dii, but different in at least one meaningful respect. Claim limitation 14dii recites “replacing the first and second images within the 3D space with a window within a two-dimensional (2D) space in response to receiving the interaction, wherein the window includes the first webpage.” Here, claim limitation 14dii does not recite that the window includes a “rendered” first webpage; rather, it simply recites that the window includes the first webpage, which could be a version previously rendered or rendered in response to the receiving of limitation 14di. Similarly, claim limitation 14diii recites receiving an interaction on a link provided in “the first webpage,” rather than in “the rendered first webpage,” as in claim limitation 1diii. Thus, the deficiency in the Petition’s evidence for claim limitations 1dii and 1diii is not present for claim limitations 14dii and 14diii.

We find that Robertson’s example of displaying an Internet browser window rendering a webpage in response to a user selecting an object thumbnail (Ex. 1004, 13:55–14:14, Fig. 9; Ex. 1003 ¶¶ 123–125; Pet. 39–40) teaches “replacing the first and second images within the 3D space with a window within a two-dimensional (2D) space in response to receiving the interaction, wherein the window includes the first webpage,” as recited in limitation 14dii. Similarly, Gettman’s example of interacting with a virtual display window, resulting in the target web site opening in a conventional

two-dimensional browser (Ex. 1006 ¶¶ 164, 200–201, Figs. 12–13; Ex. 1003 ¶¶ 126–127; Pet. 39–42) teaches this limitation. And as explained above for claim limitation 1diii, Robertson and Gralla teach that the user interacts with a link on a version of the first webpage, which is all claim limitation 14diii requires. Ex. 1003 ¶ 128; Ex. 1005, 134. Patent Owner’s arguments as to the window including “the rendered first webpage” (PO Resp. 52–56; Sur-reply 9–16) are not applicable to claim 14, as claim 14 does not include this recitation or any other recitation corresponding to it.

As to Patent Owner’s remaining arguments, Robertson and Gettman teach “replacing the first and second images within the 3D space with a window within a two-dimensional (2D) space,” as recited in claim limitation 14dii for the same reasons that they teach “replacing the first and second objects within the 3D space with a window within a two-dimensional (2D) space,” as recited in claim limitation 1dii. Patent Owner’s arguments as to this limitation (PO Resp. 38–39, 42–52; Sur-reply 19–23) are not persuasive. Thus, for the reasons given for claim 1, and as further discussed here, Robertson, Gralla, and Gettman teach each limitation of claim 14, and a skilled artisan would have had reasons, with rational underpinning, to combine the teachings of Robertson, Gralla, and Gettman, with a reasonable expectation of success.

Claim 15 depends from claim 14 and adds “wherein the additional information is displayed in the window, thereby replacing the first webpage in the window.” Petitioner contends that Robertson, Gralla, and Gettman teach the additional limitation of claim 15 for the same reasons as given for claim limitations 1dii and 1dv (which we analyze above). Pet. 53. We agree, and find that Robertson, Gralla, and Gettman teach the additional limitation of claim 15.

Claim 16 depends from claim 14 and adds

[16a] generating a third image of at least a portion of the additional information; and

[16b] replacing the window with at least the second and third images within the 3D space, wherein the third image replaces the first image in the foreground of the 3D space, and the second image remains in the background of the 3D space.

Petitioner contends that Robertson, Gralla, and Gettman teach the additional limitations of claim 16 for the same reasons as given for claim limitations 2a and 2c. Pet. 53.

As to limitations 2a and 2b, Petitioner contends that they essentially require repeating claim limitations 1cii and 1ciii. *Id.* at 44. Petitioner contends that Robertson’s 3D-GUI processing steps are performed as a sequence of cycles, resulting in claim limitations 1cii and 1ciii being repeated. *Id.* at 44–45 (citing Ex. 1004, 14:25–24; Ex. 1003 ¶ 131). As to limitation 2c, Petitioner argues that this limitation requires the 3D-GUI to revert the replacing step of claim limitation 1dii to re-enter 3D space, and that this is taught by Robertson and Gettman, e.g., Robertson’s teaching of re-entering 3D space when an object is de-selected. *Id.* at 45 (citing Ex. 1004, 16:15–17, 22:67–23:4, Fig. 22; Ex. 1006 ¶¶ 200–201; Ex. 1003 ¶¶ 135–136).

We agree that claim limitation 16a corresponds to claim limitation 2a and claim limitation 16b corresponds to claim limitation 2c. We find that Robertson, Gralla, and Gettman teach the additional limitations of claim 16 based on the evidence Petitioner presents for claim 2.

Claim 17 depends from claim 16 and adds “[17a] receiving a toggle interaction by the end user; and [17b] replacing the window with at least the second and third images within the 3D space in response to the toggle

interaction.” Petitioner contends that Robertson, Gralla, and Gettman teach the additional limitations of claim 17 for the same reasons as given for claim limitations 2c, 3a, and 3b. Pet. 53. As to claim 3, Petitioner contends that Robertson and Gettman both teach reverting the replacing step of claim limitation 1dii in response to a mouse click or button selection (a toggling interaction). *Id.* at 46 (citing Ex. 1004, 16:15–17, 22:67–23:4, Fig. 22; Ex. 1006 ¶¶ 200–201, Figs. 12–13; Ex. 1003 ¶¶ 137–138). We agree that claim limitation 17a corresponds to claim limitation 3a and claim limitation 17b corresponds to claim limitation 3b. We find that Robertson, Gralla, and Gettman teach the additional limitations of claim 17 based on the evidence Petitioner presents for claim 3.

Claim 18 depends from claim 17 and adds “[18a] receiving a navigation interaction by the end user; and [18b] moving said second image from the background of the 3D space to the foreground of the 3D space in response to the navigation interaction.” Petitioner contends that Robertson, Gralla, and Gettman teach the additional limitations of claim 18 for the same reasons as given for claim limitations 4a and 4b. Pet. 54. As to claim 4, Petitioner contends that Robertson’s object thumbnails are moved about the landscape, which a skilled artisan would have understood would include moving them from background to foreground, and vice versa. *Id.* at 46 (citing Ex. 1004, 6:32–40, 9:36–63; Ex. 1003 ¶ 139).

We agree that claim limitation 18a corresponds to claim limitation 4a and claim limitation 18b corresponds to claim limitation 4b. We find that Robertson, Gralla, and Gettman teach the additional limitations of claim 18 based on the evidence Petitioner presents for claim 4.

Patent Owner does not present separate arguments for claims 14–18. In sum, we find that Robertson, Gralla, and Gettman teach each limitation of

claims 14–18, and a skilled artisan would have had reasons, with rational underpinning, to combine the teachings of Robertson, Gralla, and Gettman, with a reasonable expectation of success.

5. *Objective Indicia of Nonobviousness*

Patent Owner presents arguments and evidence related to objective indicia of non-obviousness. PO Resp. 68–70. In support, Patent Owner relies on the Bakhsh Declaration. *Id.* (citing Ex. 2001 ¶¶ 13–23).

Notwithstanding what the teachings of the prior art would have suggested to one skilled in the art, objective evidence of nonobviousness (so called “secondary considerations”) may lead to a conclusion that the challenged claims would not have been obvious. *In re Piasecki*, 745 F.2d 1468, 1471–72 (Fed. Cir. 1984). “[E]vidence of secondary considerations may often be the most probative and cogent evidence in the record.”

Stratoflex, Inc. v. Aeroquip Corp., 713 F.2d 1530, 1538 (Fed. Cir. 1983). “[T]o be accorded substantial weight in the obviousness analysis, the evidence of secondary considerations must have a ‘nexus’ to the claims, *i.e.*, there must be ‘a legally and factually sufficient connection’ between the evidence and the patented invention.” *Henny Penny Corp. v. Frymaster LLC*, 938 F.3d 1324, 1332 (Fed. Cir. 2019) (quoting *Demaco Corp. v. F. Von Langsdorff Licensing Ltd.*, 851 F.2d 1387, 1392 (Fed. Cir. 1988)).

“The patentee bears the burden of showing that a nexus exists.” *WMS Gaming Inc. v. Int’l Game Tech.*, 184 F.3d 1339, 1359 (Fed. Cir. 1999). Patent Owner may “prove nexus by showing that the evidence of secondary considerations is the ‘direct result of the unique characteristics of the claimed invention.’” *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373–

74 (Fed. Cir. 2019) (quoting *In re Huang*, 100 F.3d 135, 140 (Fed. Cir. 1996)).

According to the Federal Circuit,

Commercial success is relevant because the law presumes an idea would successfully have been brought to market sooner, in response to market forces, had the idea been obvious to persons skilled in the art. Thus, the law deems evidence of (1) commercial success, and (2) some causal relation or “nexus” between an invention and commercial success of a product embodying that invention, probative of whether an invention was non-obvious.

Merck & Co. v. Teva Pharms. USA, Inc., 395 F.3d 1364, 1376 (Fed. Cir. 2005). “To establish a proper nexus between a claimed invention and the commercial success of a product, a patent owner must offer ‘proof that the sales were a direct result of the unique characteristics of the claimed invention—as opposed to other economic and commercial factors unrelated to the quality of the patented subject matter.’” *SightSound Techs., LLC v. Apple Inc.*, 809 F.3d 1307, 1319 (Fed. Cir. 2015) (quoting *Huang*, 100 F.3d at 140).

“Evidence that the industry praised a claimed invention or a product that embodies the patent claims weighs against an assertion that the same claimed invention would have been obvious.” *Apple Inc. v. Samsung Electronics Co., LTD*, 839 F.3d 1034, 1053 (Fed. Cir. 2016).

Patent Owner initially states that “Petitioner Fails To Address The Required ‘Objective Indicia’ Of Non-Obviousness.” PO Resp. 68; *see also id.* at 70 (“Petitioner fails to adequately address these secondary considerations of non-obviousness and instead relies on improper hindsight”). However, Petitioner did address in the Petition Patent Owner’s

evidence of industry praise, for instance, arguing that it contained statements that undermined Patent Owner’s position.⁵ *See* Pet. 85–87.

Patent Owner discusses, primarily, objective indicia in the form of industry praise reported in “technical journals and newspapers.” PO Resp. 69 (citing Ex. 2001 ¶¶ 13–16). Although the Patent Owner Response does not allege a nexus between the industry praise and the claimed invention, Mr. Bakhsh testifies that *TechNewsWorld* stated that, “[w]ith SpaceTime, I have an unlimited 3-D space . . . [that] lets me alternate between 3-D and 2-D perspectives” Ex. 2001 ¶ 16. However, *TechNewsWorld* (Exhibit E to Exhibit 2001) does not clearly identify the claimed invention or any of its features. *See* Ex. 2001 ¶ 16, pp. 88–91 (Exhibit E). It simply describes “[a]n innovative three-dimensional search program” and a “browser.” *Id.* at pp. 88–91 (Exhibit E). Thus, Patent Owner’s evidence does not show a nexus between the claimed invention and the industry praise, and Patent Owner’s evidence of industry praise is entitled to little weight.

Similarly, Mr. Bakhsh testifies that Samsung sent emails to SpaceTime3D expressing interest in its technology and inviting SpaceTime3D to present its technology at Samsung’s headquarters. Ex. 2001 ¶¶ 17–23; PO Resp. 69. However, Patent Owner does not allege a nexus between these emails and the claimed invention and it is unclear from reading the emails (Exhibits F–J to Exhibit 2001) that they are referring to the claimed invention. All they mention is SpaceTime’s “technology and solutions.” *See* Ex. 2001 ¶¶ 17–23, pp. 92–104 (Exhibits F–J). Thus, Patent

⁵ Patent Owner had alleged similar evidence of industry praise in an earlier *inter partes* review, which Petitioner addressed in the Petition. Pet. 85.

Owner’s evidence does not show a nexus between the claimed invention and the Samsung emails.

Finally, Patent Owner contends that Samsung and LG licensed the ’048 patent, and argues that “[g]iven the nature of these licenses, they are strong indicators of commercial success.” PO Resp. 69–70 (citing Ex. 2016 (Declaration of Patent Owner’s attorney, Todd Fitzsimmons (filed under seal))). Petitioner argues that merely alleging the existence of licenses does not prove nexus, and that Patent Owner’s cursory reference to the nature of the licenses lacks sufficient explanation and analysis. Reply 27 (citing *In re Antor Media Corp.*, 689 F.3d 1282, 1293–94 (Fed. Cir. 2012)). We observe that “[Federal Circuit] cases specifically require affirmative evidence of nexus where the evidence of commercial success presented is a license, because it is often ‘cheaper to take licenses than to defend infringement suits.’” *Bosch Auto. Serv. Sols., LLC v. Matal*, 878 F.3d 1027, 1038 (Fed. Cir. 2017), as amended on reh’g in part (Mar. 15, 2018) (quoting *Iron Grip Barbell Co. v. USA Sports, Inc.*, 392 F.3d 1317, 1324 (Fed. Cir. 2004)). The Patent Owner Response does not allege, with particularity, what about these licenses are strong indicators of commercial success, or allege any nexus between the licenses and the claimed invention. PO Resp. 69–70.

In response to Petitioner’s argument that alleging the existence of licenses does not show the requisite nexus, Patent Owner argues:

The licenses themselves have been submitted as evidence along with a declaration that provides details of the licenses, including that (i) the licenses are limited to the ’048 patent and patents that are related thereto (e.g., patents that are at issue in IPR2023-00343 and 344), (ii) licensees (Samsung and LG) are two of the three largest smartphone manufactures in the United States, and (iii) and the amounts paid for the licenses.

Sur-reply 27 (citing *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1353 (Fed. Cir. 2012)). If it is Patent Owner’s position that the Declaration of its attorney, Mr. Fitzsimmons, includes the arguments missing from the Patent Owner Response that would show a nexus between the alleged commercial success and the claimed invention, it is improper, under our rules, to incorporate such arguments by reference from the Declaration into the Patent Owner Response. *See* 37 C.F.R. § 42.6(a)(3) (“Arguments must not be incorporated by reference from one document into another document.”). Thus, those arguments are forfeited and will be disregarded.

In any case, even if we were to consider the Fitzsimmons Declaration, we see no persuasive argument in the Fitzsimmons Declaration or persuasive evidence in the attached licenses, to support Patent Owner’s allegation of commercial success and corresponding nexus. As Patent Owner has not shown a nexus between the alleged commercial success and the claimed invention, we find that Patent Owner’s evidence of commercial success is entitled to little weight. *See Bosch*, 878 F.3d at 1038 (“Given the lack of evidence that these licenses were entered into out of respect for the [challenged] patent, it was reasonable for the Board to assign less credit to the licensing evidence.”). The *Transocean* case does not help Patent Owner. Even if “the royalties paid under the licenses exceed any litigation costs, and thus are an accurate reflection of the value of the claimed invention” in this case, which Patent Owner has not alleged specifically, “[t]he jury [in *Transocean*] found that Transocean established that its licenses to customers and competitors were due to the merits of the claimed invention and thus support nonobviousness.” 699 F.3d at 1353. Here, Patent Owner does not

allege in its briefs, and Patent Owner’s evidence does not show, that its licenses were due to the merits of the claimed invention.

In sum, we have considered Patent Owner’s evidence of industry praise and commercial success, but, on the complete record, we find it unpersuasive and entitled to little weight.

6. Conclusion of Obviousness

In sum, as detailed above, Petitioner’s proposed combination of Robertson, Gralla, and Gettman teaches each limitation of claims 14–18, but not claims 1–13. A skilled artisan would have had reasons, with rational underpinning, to combine the teachings of Robertson, Gralla, and Gettman, with a reasonable expectation of success. Patent Owner’s objective indicia of nonobviousness are unpersuasive and entitled to little weight. Upon consideration of all the evidence, we conclude that Petitioner has proved by a preponderance of the evidence that claims 14–18 would have been obvious over Robertson, Gralla, and Gettman, but has not proved, by a preponderance of the evidence, that claims 1–13 would have been obvious over Robertson, Gralla, and Gettman.

C. Obviousness over Sauve and Tsuda

Petitioner contends that claims 1–18 would have been obvious over Sauve and Tsuda. Pet. 54–85.

1. Scope and Content of the Prior Art

a. Overview of Sauve (Ex. 1007)

Sauve relates to browsing software that “provide[s] a quick pick user-interface that visually displays the several tabs” open in a tabbed browser window. Ex. 1007 ¶ 6.

Figure 4, reproduced below, depicts “a display illustrating one embodiment for the quick pick user-interface and illustrating a user’s selection within the interface.” Ex. 1007 ¶ 11.

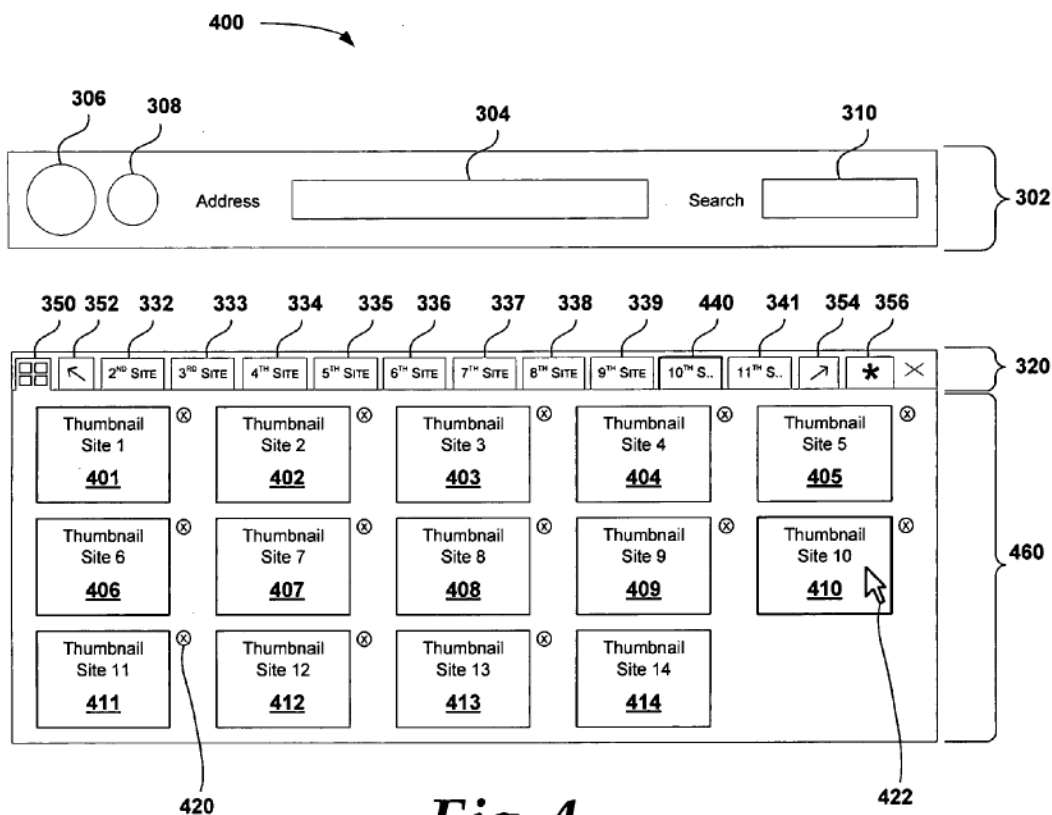


Fig. 4

Figure 4 of Sauve is a block diagram of quick pick user-interface 400 with quick pick window 460 displaying thumbnails 401–414. Quick pick window 460 of quick pick user-interface 400 displays “a rich set [of]

information, such as a graphical representation (e.g., thumbnails 402–411) for each of the open tabs in the tab row 320, [and] a graphical representation (e.g., thumbnails 401, 412–414) of the open tabs that are not currently visible in the tab row because they are in the overflow.” *Id.* ¶42. Each thumbnail is scaled “so that the content of each tab can be viewed in the quick pick window 460.” *Id.*

b. Overview of Tsuda (Ex. 1008)

Tsuda relates to a “multiple window display device” that “display[s] windows inclined in the depth direction of the screen (hereafter also described as the ability to display windows in perspective) as if placed in a virtual 3D space.” Ex. 1008, 10:57–61.

Figure 11B of Tsuda, reproduced below, depicts an exemplary alignment method of windows. Ex. 1008, 8:3–4.

FIG. 11B

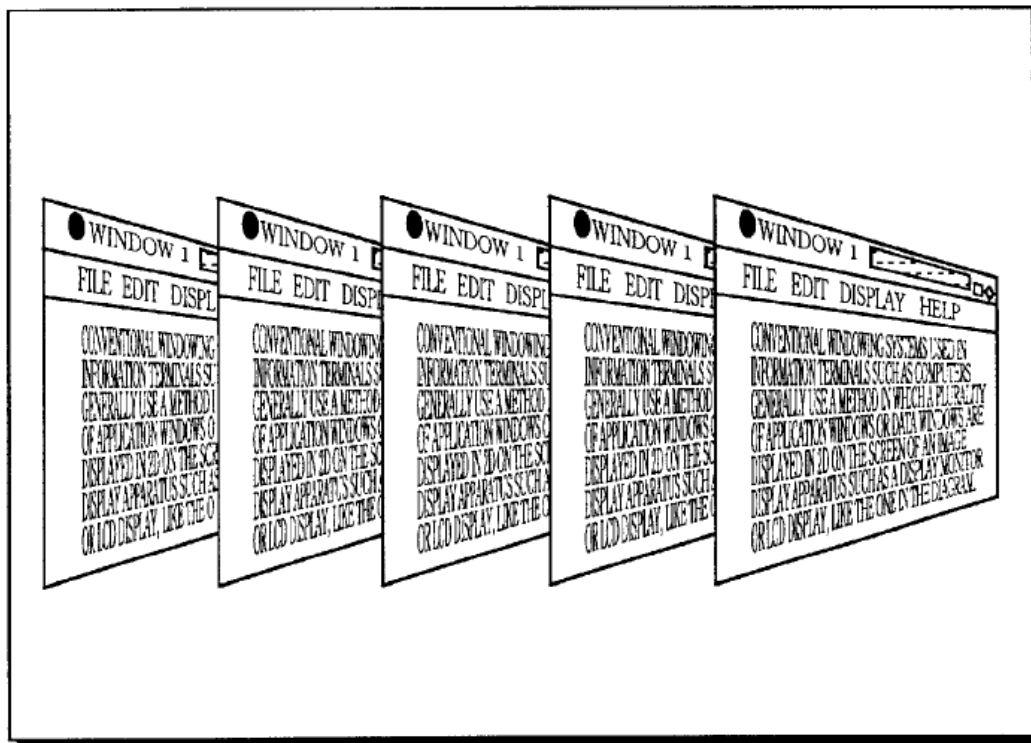
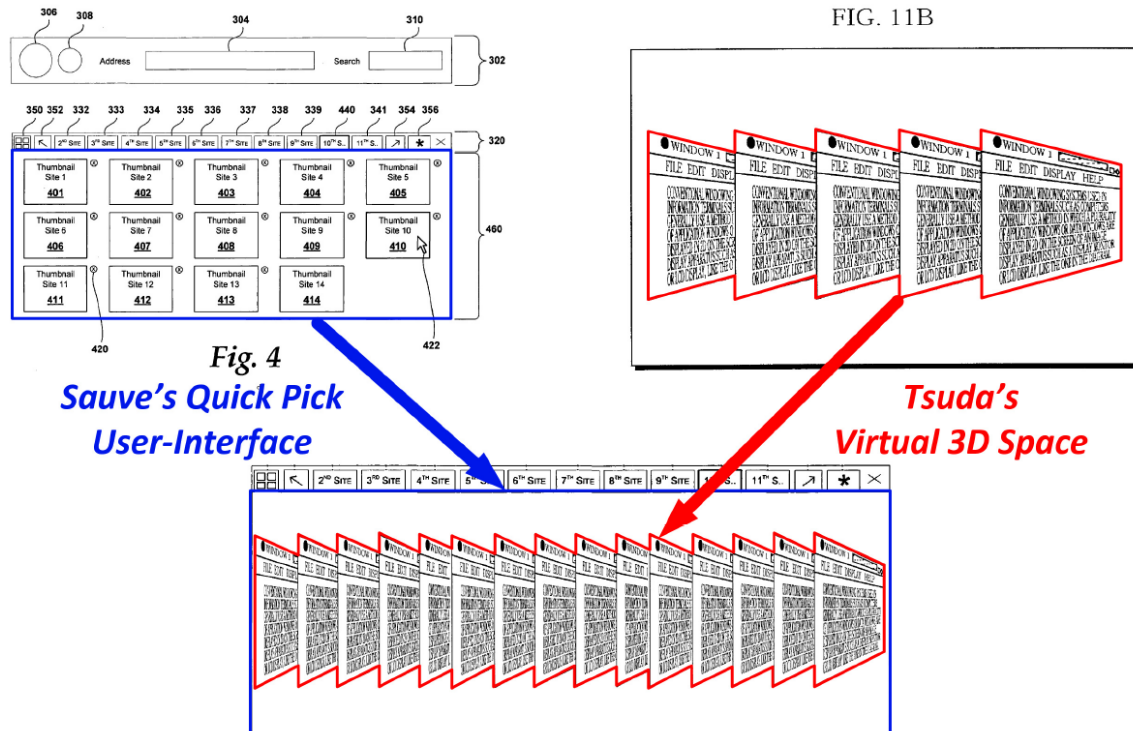


Figure 11B shows an example of windows aligned in 3D. In Figure 11B, five windows have been aligned in a stacked arrangement by using a 3D position calculating unit. *Id.* at 17:53–65.

2. Claims 1–13

In Petitioner’s proposed combination, a skilled artisan would have applied Tsuda’s teachings of a user interface with a virtual 3D space to Sauve’s quick pick user-interface for a tabbed browser, as shown in Petitioner’s annotated combination of Sauve’s Figure 4 and Tsuda’s Figure 11B, reproduced below:



The figure above shows Sauve's Figure 4 (a block diagram of a quick pick user interface and browser tabs) and Tsuda's Figure 11B (a picture of stacked windows) combined into a single image (illustrating stacked windows corresponding to browser tabs). Pet. 57–58 (citing Ex. 1003 ¶¶ 155–163).

Petitioner argues that Tsuda states that its invention may also be effective for desktop computers, “if a user is browsing various homepages on the Internet.” *Id.* at 58 (quoting Ex. 1008, 14:24–26). Petitioner contends that a skilled artisan would have seen the 2D thumbnails of the quick pick interface of Sauve's tabbed web browser as a natural place to take Tsuda's suggestion to apply its solution, and would have appreciated that efficiently depicting 3D windows in perspective view would have been beneficial in that context. *Id.* at 58–59 (citing Ex. 1008, 14:16–24; Ex. 1003 ¶¶ 156–158). Relying on the testimony of Dr. Fuchs, Petitioner further argues that the known benefits of 3D-GUIs, such as Tsuda's, would have

predictably improved Sauve’s quick pick interface, and would have promoted space efficiency and conveyed order more clearly. *Id.* at 59–60 (citing Ex. 1003 ¶ 159). Petitioner further argues that the combination would have exploited spatial memory and more efficient use of screen space and, thus, would have been a differentiator among competing web browsers. *Id.* at 60–61 (citing Ex. 1003 ¶¶ 160–162). Petitioner argues that a skilled artisan would have had a reasonable expectation of success in making the combination because GUIs, web browsers, and simulated 3D environments were all well-known technologies that had been demonstrated successfully in the real world. *Id.* at 61 (citing Ex. 1003 ¶ 163). Dr. Fuchs’ testimony has rational underpinning, is logical and well-reasoned, and, accordingly, we give it substantial weight.

Patent Owner argues that Tsuda teaches away from presenting objects in a background of 3D space. PO Resp. 59. Patent Owner argues that Tsuda describes a GUI that functions exclusively in 3D, and that switching to 2D would have been counterintuitive to the teachings of Tsuda. *Id.* at 66–67 (citing Ex. 1008, 1:26–28, 14:16–27; Ex. 2014 ¶ 225). Relying on Dr. Schaefer’s testimony, Patent Owner argues that “both references provide vastly different solutions to the same problem, *i.e.*, how to interact with windows that are otherwise hidden in 2D space, that have much different hardware and software requirements.” *Id.* at 67 (citing Ex. 2014 ¶¶ 93, 227). Thus, Patent Owner argues, a skilled artisan would not have combined Sauve and Tsuda, but would have chosen one solution or the other. *Id.* Patent Owner argues that “the whole purpose of Sauve is to make each webpage more distinguishable, as the stacking nature of a tab browser provides limited information for each tab,” and that Petitioner’s combination

with Tsuda would not have achieved the objectives of Sauve. Sur-reply 24 (citing Ex. 2014 ¶ 112), 26.

Patent Owner’s arguments are not persuasive. As noted above, a reference teaches away “when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant.” *Gurley*, 27 F.3d at 553. We have considered the portions of Sauve and Tsuda cited by Patent Owner and Dr. Schaefer, and find nothing that would discourage or lead in a direction divergent from the path taken by the inventor. Other than repeating Patent Owner’s argument that Sauve and Tsuda provide drastically different solutions for moving from one active window to another, Dr. Schaefer does not explain why he concludes that the solutions teach away from one another or point to evidence to support that conclusion. Ex. 2014 ¶¶ 225–227.

Dr. Schaefer’s testimony at paragraph 112 of his Declaration cites to paragraph 3 of Sauve, which states: “after opening several web pages, each in its own window, the taskbar may become quite cluttered. This makes it difficult to re-locate a particular web page. Tabbed browsers have been introduced to help manage the viewing of multiple web pages.” Ex. 1007 ¶ 3. Nothing in this statement purports to discourage or lead in direction different from a combination with Tsuda. Instead, Sauve calls out for a solution that would organize several open webpages, a problem that Tsuda attempts to solve. Ex. 1007 ¶ 3; Ex. 1008, 14:16–27; Ex. 1003 ¶¶ 159, 162. As Petitioner points out, two references teaching different solutions to the same problem does not teach away from combining those references. Reply 23–24 (citing *Intel Corp. v. PACT XPP Schweiz AG*, 61 F.4th 1373, 1380 (Fed. Cir. 2023)) (“[I]f there’s a known technique to address a known

problem using prior art elements according to their established functions, then there is a motivation to combine.”)).

Patent Owner further argues that, if a skilled artisan were to combine Sauve and Tsuda, “the motivation would be to present *the hidden webpages (tabs)* in 3D space—not *the thumbnails* as Petitioner contends,” because, in Sauve, “it is the webpages (or tabs) for which ‘there is inefficient space.’” PO Resp. 67–68 (citing Ex. 2001 ¶ 52; quoting Ex. 1007 ¶ 38; citing Ex. 2014 ¶ 228). Patent Owner offers nothing more than conclusory testimony to support this alternative combination. *Id.* However, even if a skilled artisan also would have considered Patent Owner’s alternative proposal, as we explained above, “the ‘mere disclosure of alternative designs does not teach away.’” *Mouffet*, 686 F.3d at 1334 (quoting *Fulton*, 391 F.3d at 1201).

In sum, Petitioner has presented persuasive evidence that a skilled artisan would have combined the teachings of Sauve and Tsuda. We have considered Patent Owner’s teaching away arguments and find them weak and unpersuasive. Accordingly, we find that a skilled artisan would have had reasons, with rational underpinning, to combine the teachings of Sauve and Tsuda, with a reasonable expectation of success.

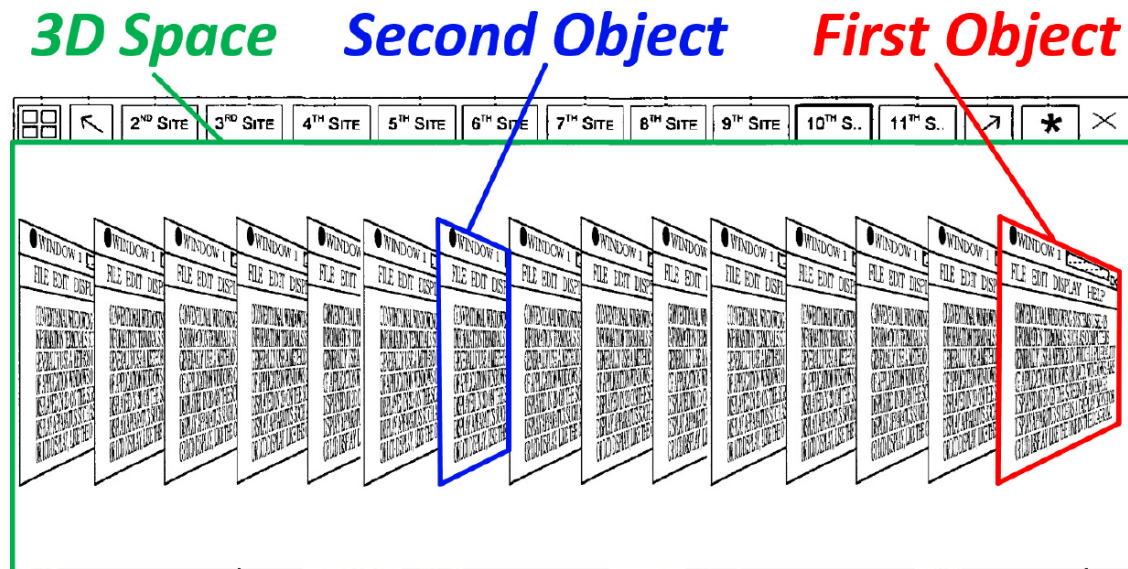
As to the preamble⁶ of claim 1, Petitioner contends that Sauve describes a “tab UI” that provides a quick pick user interface, where each browser tab is displayed as a graphical representation. Pet. 61 (citing Ex. 1007 ¶¶ 35, 42, Figs. 2, 4). Petitioner argues that the combination of

⁶ For purposes of this Decision, we need not determine whether the preamble is limiting, as Petitioner’s evidence is sufficient to show that Sauve teaches the preamble, if it is limiting.

Sauve with Tsuda would represent Sauve’s 2D-GUI as a 3D-GUI. *Id.* at 61–62 (citing Ex. 1008, 1:5–12, 14:16–27, Figs. 1, 5, 11B, 12A–C; Ex. 1003 ¶ 164). We agree, and find that Sauve and Tsuda teach the preamble of claim 1.

Petitioner cites to Sauve’s description of a web browser receiving an address as input to an address bar of a browser and receiving a webpage in return as teaching claim limitations 1a and 1b. *Id.* at 62–63 (citing Ex. 1007 ¶¶ 2, 4, 5, 40, Fig. 3; Ex. 1003 ¶¶ 165, 167). We agree and find that Sauve teaches receiving first and second inputs from an end user and receiving first and second webpages in response. Thus, Sauve teaches claim limitations 1a and 1b.

As to claim limitation 1c, Petitioner contends that Sauve’s quick pick interface visually displays thumbnail images describing each tab, and that in combination with Tsuda, the visually displayed information would have been placed in a virtual 3D space. *Id.* at 64–65 (citing Ex. 1007 ¶¶ 18, 42; Ex. 1008, 10:52–62, 11:27–31, 11:59–12:4, 12:8–67, 13:15–43, Figs 2B, 3C, 4, 5; Ex. 1003 ¶¶ 169–170). Patent Owner argues that if a skilled artisan were to combine Sauve and Tsuda, “the motivation would be to present *the hidden webpages (tabs)* in 3D space—not *the thumbnails* as Petitioner contends.” PO Resp. 67 (citing Ex. 2001 ¶ 52). For the reasons given above, we are not persuaded that Patent Owner’s alternative proposed combination undermines that proposed by Petitioner. In Petitioner’s combination, at least a portion of first and second webpages, thumbnails, are displayed on first and second objects, as shown in Petitioner’s annotated combination of Sauve’s Figure 4 and Tsuda’s Figure 11B, reproduced below:



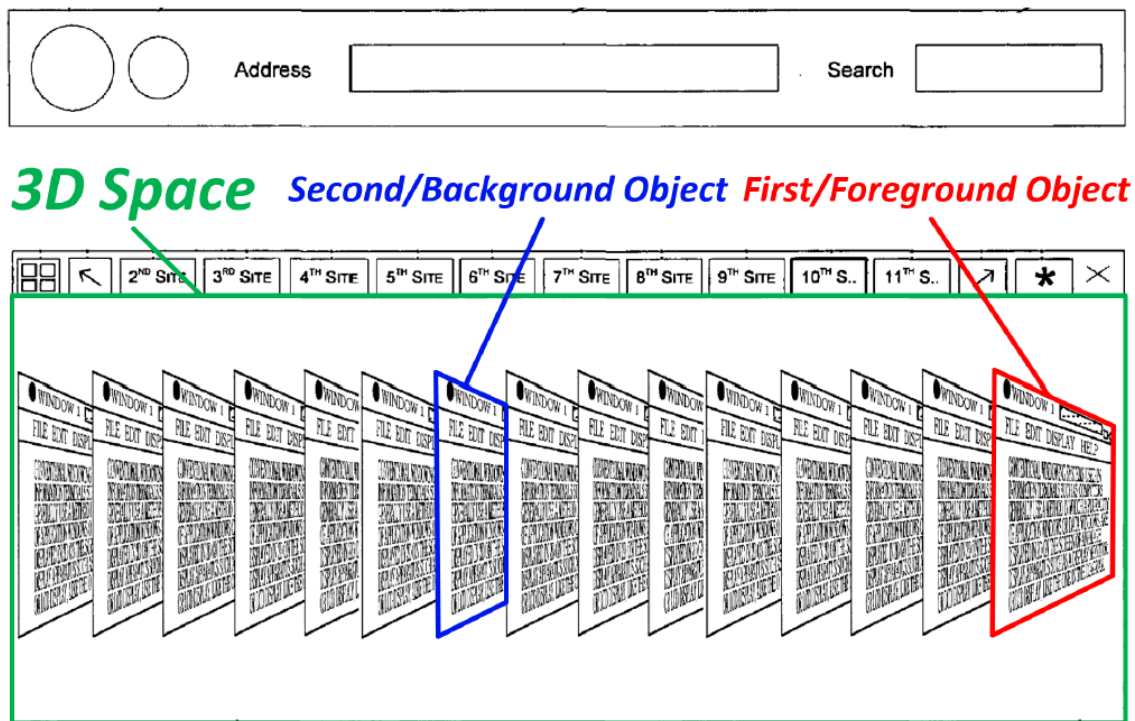
Petitioner's annotated figure, above, shows a 3D space (in green), including a texture-mapped image on a first object (in red) and a texture-mapped image on a second object (in blue). Pet. 66. We find that the combination of Sauve and Tsuda teaches claim limitation 1c.

As to claim limitation 1ci, Petitioner argues that Sauve's browser renders HTML for each webpage of its tabs. *Id.* at 66–67 (citing Ex. 1007 ¶¶ 2, 4, 26–27, 41; Ex. 1003 ¶¶ 173–174). Petitioner argues that Sauve suggests capturing images of the webpages to create thumbnails and that Tsuda describes displaying objects as bitmap images, with either example satisfying claim limitation 1cii. *Id.* at 67 (citing Ex. 1007 ¶¶ 41–42; Ex. 1008, 11:4–12, 13:10–46, Figs. 1, 4–6, 9, 11–12C; Ex. 1003 ¶¶ 175–176). We agree with Petitioner, and find that Sauve and Tsuda teach claim limitations 1ci and 1cii.

As to claim limitation 1ciii, Petitioner contends that Tsuda describes texturing first and second images from 2D content, such as the webpages described in Sauve, onto first and second windows in 3D space. Pet. 68 (citing Ex. 1008, 13:15–43, Fig. 4 (steps S5122–S5124); Ex. 1003 ¶¶ 177–

179). We agree, and find that Tsuda teaches “texturing the first image on the first object and the second image on the second object,” as recited in claim limitation 1ciii.

As to “the first object being displayed in a foreground of the 3D space and the second object being displayed in a background of the 3D space,” as recited in limitation 1ciii, Petitioner argues that “Tsuda’s windows (*objects*) are stacked horizontally from right to left, such that the rightmost window in the stack occupies a plane that is forward in the stack (*first object* in a *foreground*) relative to the plane of a window further to left (*second object* in a *background*).” *Id.* at 69 (citing Ex. 1008, 8:3–14, 17:25–32, 18:8–18; Ex. 1003 ¶¶ 180–181 (depicting Petitioner’s annotated version of Tsuda Fig. 11 in the context of Sauve’s quick pick user-interface)). Petitioner presents the annotated figure, reproduced below, as an example of how the features of Tsuda and Sauve would have been combined:



Petitioner’s annotated figure, above, shows a 3D space (in green), including a first foreground object (in red) and a second background object (in blue).

Id. Dr. Fuchs testifies that “[i]n Figures 11B–12C, Tsuda’s windows (objects) are stacked horizontally from right to left, such that the rightmost window in the stack occupies a plane that is forward in the stack (**first object** in a **foreground**) relative to the plane of a window further to left (**second object** in a **background**).” Ex. 1003 ¶ 180.

Patent Owner disagrees, contending that

Petitioner’s argument . . . contradicts Tsuda, which provides that at least a portion of each object is presented in the foreground, “inclined in a depth direction, so that . . . even if a plurality of windows are being displayed, the user can grasp the type and display content of each window at a glance.”

PO Resp. 65–66 (quoting Ex. 1008, 2:13–26).

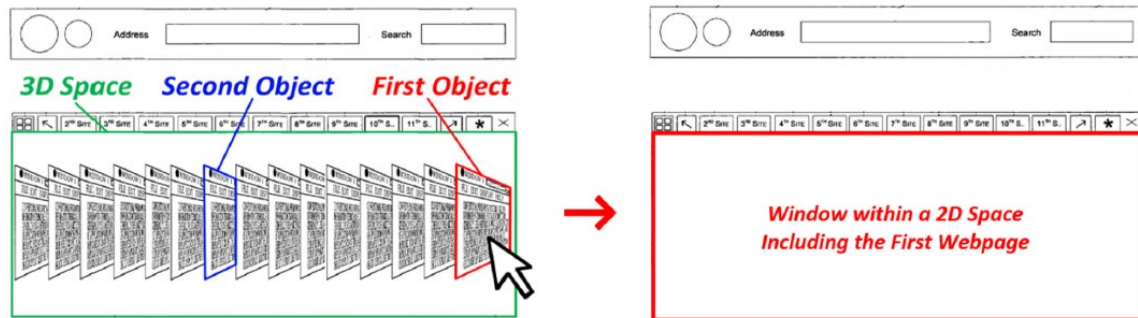
We agree with Petitioner and find that the first object (in red in Petitioner’s annotated figure above) appears in the foreground relative to the second object in the stack (in blue in Petitioner’s annotated figure), with the second object remaining in the background relative to the first object.

Accordingly, we find that Sauve and Tsuda teach claim limitation 1ciii.

For claim limitation 1di, Petitioner contends that Sauve teaches that an end user can switch from the quick pick user-interface (shown in Sauve’s Figure 4) and a tabbed window showing the webpage content for an in-focus tab (shown in Sauve’s Figure 5) by “select[ing] any one of the thumbnails to view its corresponding content.” Pet. 72 (quoting Ex. 1007 ¶¶ 43–44; citing Ex. 1007 ¶¶ 18, 43, Figs. 4–5; Ex. 1003 ¶ 190). We agree with Petitioner and find that Sauve teaches claim limitation 1di.

As to claim limitation 1dii, Petitioner argues that “the web browser of the Combination **replaces** the **3D space** of the quick pick user-interface,

which includes the (*first/second*) virtual 3D windows (*objects*), with a *window within a 2D space* including the (*first*) *webpage* of the selected tab,” arriving at the arrangement shown in the annotated figure reproduced below. Pet. 73–74 (citing Ex. 1007 ¶¶ 18, 42–44; Ex. 1003 ¶¶ 192–193).



Petitioner’s annotated figure, above, shows the annotated figure from page 66 of the Petition on the left, followed by an arrow, and a figure on the right showing the 3D space of the left figure replaced by a window within a 2D space including the first webpage. *Id.* at 74.

In response, Patent Owner argues that “Tsuda provides *no order* in which the objects should be presented in 3Dspace, let alone the claimed *chronological order*.” PO Resp. 59 (citing Ex. 2014 ¶ 178). Patent Owner continues, “Sauve does not disclose which object should be presented in the foreground of 3D space and which object should be presented in the background of 3D space, and therefore cannot make up for this deficiency in Tsuda.” *Id.* at 60 (citing Ex. 2014 ¶ 180); *see also* Sur-reply 7–8. Petitioner contends that Patent Owner’s arguments are moot because the claims do not require a 3D stack of objects arranged chronologically. Reply 19. As explained in the Claim Construction section above, the challenged claims do not require Patent Owner’s proposed chronological ordering. Accordingly, Patent Owner’s argument is not persuasive.

Patent Owner also argues that “the windows in Tsuda are already active and interacting with one merely results in the window being displayed ‘facing the front’ in 3D space.” PO Resp. 64 (citing Ex. 1008, 2:57–67). According to Patent Owner, “using Tsuda to function as a quick pick user-interface would not result in an active window in 2D space ‘replacing’ a plurality of images in 3D space. Instead, it would result in an active window in 3D space being rotated to face the front in 3D space (e.g., for editing).” *Id.* at 64–65. This argument is not persuasive, as Petitioner relies on *Sauve* to show a window within a 2D space. Pet. 73–74 (citing Ex. 1007 ¶¶ 18, 42–43; Ex. 1003 ¶¶ 192–193). *See also In re Keller*, 642 F.2d 413, 426 (CCPA 1981) (“[O]ne cannot show non-obviousness by attacking references individually where, as here, the rejections are based on combinations of references.”).

As to replacing Tsuda’s objects in 3D space with a window in 2D space per *Sauve*’s teachings, Patent Owner argues that “[s]witching to 2D would be counterintuitive to the teachings of Tsuda, and therefore nonobvious.” PO Resp. 66 (citing Ex. 2014 ¶ 225). As explained above, we find that Tsuda does not teach away from a combination with *Sauve*.

Patent Owner argues that “interacting with a thumbnail in *Sauve* does not result in displaying ‘the [previously] rendered first webpage’ in a window in 2D space. Instead, it results in the corresponding webpage being loaded (e.g., received and rendered) in tab window (312).” PO Resp. 60 (citing Ex. 1007 ¶¶ 2, 27). Patent Owner argues that “***tab UI (222) receives URLs for each webpage and links each URL to a corresponding graphical representation (i.e., thumbnail).***” *Id.* at 61 (citing Ex. 1007 ¶¶ 33, 35, Fig. 2; Ex. 2014 ¶ 117). Patent Owner argues that “URLs are used to load (retrieve and render) webpages in response to interactions with individual

graphical representations (or thumbnails) in the quick pick user-interface,” typical of how web browsers operate. *Id.* (citing Ex. 1007 ¶ 2; Ex. 2014 ¶ 118). Patent Owner points to description in Sauve that “[t]abbed browsers load web pages in ‘tabs’ within the same browser window.” *Id.* at 62–63 (quoting Ex. 1007 ¶ 4). According to Patent Owner,

The “replacing” feature is . . . missing if the thumbnails disclosed in Sauve are arranged in Tsuda-like fashion (e.g., in a 3D space), which appears to be Petitioner’s argument. This is because the thumbnails in Sauve do not result in “replacing” the images in 3D space with a window in 2D space “wherein the window includes the [previously] rendered first webpage.”

Id. at 65. Patent Owner further cites to Sauve’s description that

By having multiple threads, at least one for each content window 202, the architecture prevents a potential bottleneck caused by having only one thread handle the messages for all HTML rendering across the multiple tabs. In addition, having multiple threads reduces the likelihood of unnecessary delays or timeouts when downloading web pages.

Ex. 1007 ¶ 27. We note that Dr. Schaefer does not state the basis for the inferences he draws from reading Sauve, rendering that testimony of little value. Ex. 2014 ¶¶ 116–118.

Petitioner disagrees with Patent Owner’s reading of Sauve. Sauve describes:

The user may select any one of the thumbnails to view its corresponding content in the tabbed window. . . .

In this example, the user selected thumbnail 410 in the quick pick user-interface shown in FIG. 4. Thus, the tabbed window displays the tab (i.e., tab 340) associated with thumbnail 410 as the in focus tab. *Content of the in focus tab is displayed as the content 560 in the tabbed window 312.*

Ex. 1007 ¶¶ 43–44 (emphasis added). Petitioner argues that “is displayed” should be understood to mean that “the content displayed upon selection of

an object thumbnail is the same version of the webpage that was originally loaded and used to create the thumbnail.” Reply 23. Dr. Fuchs testifies that “displaying the webpage content of a tab corresponding to a selected thumbnail does not require re-loading a new version of the webpage from the origin server,” and that “[r]e-loading a page each time a user selects a new tab is nonsensical and would defeat the purpose of using a tabbed browser in the first place.” Ex. 1060 ¶¶ 102–103. Dr. Fuchs also does not explain the basis for the inferences he draws from reading Sauve, rendering that testimony of little value. We note that the testimony Dr. Fuchs offers in support of the Petition is virtually silent as to whether Sauve displays a previously rendered version of a webpage or renders the webpage when a thumbnail is selected. Ex. 1003 ¶¶ 192–193.

We have analyzed the parties’ citations to Sauve, and none clearly specifies whether selecting a thumbnail causes a webpage to be rendered anew or whether a previously rendered version of the webpage is displayed. Sauve states that

By having multiple threads, at least one for each content window 202, the architecture prevents a potential bottleneck caused by having only one thread handle the messages for all HTML rendering across the multiple tabs. In addition, having multiple threads reduces the likelihood of unnecessary delays or timeouts when downloading web pages.

Ex. 1007 ¶ 27. Although this suggests that webpages for all tabs should not be rendered at the same time, and can perhaps be read to suggest that maintaining several rendered webpages simultaneously could run up against resource constraints, Sauve does not expressly state this. Paragraph 42 states that “[t]he thumbnails for each of the open tabs are readily available in memory,” but does not state that the rendered webpages are available.

Id. ¶ 42. Paragraphs 43 and 44 state that a user may select a thumbnail and the tabbed window displays the corresponding content. *Id.* ¶¶ 43–44.

However, the corresponding content would be displayed regardless of when the webpage was rendered. As noted above, neither party’s expert provides helpful testimony on this point.

“In an *inter partes* review, the burden of persuasion is on the petitioner to prove “unpatentability by a preponderance of the evidence,” 35 U.S.C. § 316(e), and that burden never shifts to the patentee. “Failure to prove the matter as required by the applicable standard means that the party with the burden of persuasion loses on that point—thus, if the fact trier of the issue is left uncertain, the party with the burden loses.”

Dynamic Drinkware, LLC v. National Graphics, Inc., 800 F.3d 1375, 1378–79 (Fed. Cir. 2015) (quoting *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1327 (Fed. Cir. 2008)). As explained in the Claim Construction section above, “the rendered first webpage” means the rendered version of the webpage from which the corresponding image was captured. It is Petitioner’s burden to prove that Sauve teaches that, in replacing the first and second objects with a window in 2D space, that window includes the rendered version of the webpage from which the corresponding image was captured, not a new version of the webpage rendered when the user selects a thumbnail. Petitioner has not met this burden. Accordingly, Petitioner has not proved, by a preponderance of the evidence, that claim 1 would have been obvious over Sauve and Tsuda.

In sum, we find that neither Sauve nor Tsuda teaches “replacing the first and second objects within the 3D space with a window within a two-dimensional (2D) space in response to receiving the interaction, wherein the window includes *the rendered first webpage*,” as recited in claim limitation 1dii. As with Robertson, Gralla, and Gettman, this issue is dispositive for

claim 1 and independent claim 8, which similarly recites “replacing the first and second objects within the 3D space with a window within a two-dimensional (2D) space on the display screen in response to receiving the interaction, wherein the window includes *the rendered first webpage*.” It also is dispositive for claims 2–7 and 9–13, which depend from claims 1 and 8, respectively. Nevertheless, we address the remaining limitations of claim 1, as it bears on the patentability of independent claim 14, as discussed in detail below.

As to claim limitations 1 diii–1 dv, Petitioner argues that Sauve’s tabbed browser provides conventional point-and-click web surfing and browsing functionality, which would have included

receiving a mouse click ***interaction by the end user on a link provided in the rendered (first) webpage, the link corresponding to*** a new webpage (***additional information***), per Element [1.d.iii]; ***rendering*** the new webpage (***additional information***), per Element [1.d.iv]; and ***displaying*** the rendered webpage (***additional information***) ***in said window within the 2D space***, per Element [1.d.v].

Pet. 74–75 (citing Ex. 1007 ¶¶ 2–5, 25–27, 42–44; Ex. 1003 ¶ 194). Patent Owner does not present separate argument for claim limitations 1 diii–1 dv. We agree with Petitioner and find that Sauve teaches claim limitations 1 div–1 dv. We also find that Sauve and Tsuda teach receiving an interaction by a user on a link, corresponding to additional information, provided in the rendered webpage, as recited in claim limitation 1 diii. However, as noted above for claim limitation 1 dii, in Petitioner’s combination, the rendered webpage in the window within the 2D space is of the current or live version of the webpage, rather than the “rendered first webpage.” Thus, for the same reasons as given for claim limitation 1 dii, the combination of Sauve

and Tsuda does not teach receiving an interaction on a link provided in “the rendered first webpage,” as recited in claim limitation 1diii.

3. Claims 14–18

Petitioner and Patent Owner cite back to their arguments and evidence as to claim 1 for independent claim 14. Pet. 84–85; PO Resp. 68.

As explained for Robertson, Gralla, and Gettman, claim 14 is similar in most respects to claim 1. However, claim limitation 14dii differs from claim limitation 1dii in that claim limitation 14dii does not recite that the window includes a “rendered” first webpage; rather, it simply recites that the window includes the first webpage, which could be a version previously rendered or rendered in response to the receiving of limitation 14di. Thus, the deficiency in the Petitioner’s evidence for claim limitation 1dii is not present for claim limitation 14dii.

We agree with Petitioner (Pet. 84–85) that the evidence and argument Petitioner presents for claim limitations 1a–1di and 1div–1dv are sufficient to show that Sauve and Tsuda teach claim limitations 14a–14di, and 14div, for the reasons given above. Aside from arguing that the claims have a chronological order requirement and that Tsuda does not teach displaying a first object/image in the foreground and a second in the background (claim limitations 1cii, 14cii), Patent Owner does not present separate arguments for these limitations. Like claim 1, claim 14 does not have Patent Owner’s proposed chronological order requirement. For the same reasons as given for claim 1, Patent Owner’s arguments on this point are not persuasive. And, as we explain above, Tsuda teaches displaying a first object in the

foreground and a second in the background; thus, this argument is not persuasive as to claim limitation 14cii.

As to claim limitation 14dii, we find that Sauve describes a user selecting a thumbnail image and the web browser replacing the quick pick user-interface. Ex. 1007 ¶¶ 18, 42–43. In Petitioner’s proposed combination with Sauve, Tsuda’s 3D space would be replaced by the web browser window within a 2D space. Ex. 1003 ¶¶ 192–193. As explained above, Sauve and Tsuda do not teach away from such a combination. And as explained above for claim limitation 1diii, Sauve and Tsuda teach that the user interacts with a link on the first webpage, which is all claim limitation 14diii requires. Ex. 1007 ¶¶ 2–5, 25–27, 42–44.

Thus, for the reasons given for claim 1, and as further discussed here, Sauve and Tsuda teach each limitation of claim 14, and a skilled artisan would have had reasons, with rational underpinning, to combine the teachings of Sauve and Tsuda, with a reasonable expectation of success.

Claim 15 depends from claim 14 and adds “wherein the additional information is displayed in the window, thereby replacing the first webpage in the window.” Petitioner contends that Sauve and Tsuda teach the additional limitation of claim 15 for the same reasons as given for claim limitations 1dii and 1dv (which we analyze above). Pet. 84. We agree, and find that Sauve and Tsuda teach the additional limitation of claim 15.

Claim 16 depends from claim 14 and adds

[16a] generating a third image of at least a portion of the additional information; and

[16b] replacing the window with at least the second and third images within the 3D space, wherein the third image replaces the first image in the foreground of the 3D space, and the second image remains in the background of the 3D space.

Petitioner contends that Sauve and Tsuda teach the additional limitations of claim 16 for the same reasons as given for claim limitations 2a and 2c.

Pet. 84–85.

As to limitations 2a and 2b, Petitioner contends that they essentially require repeating claim limitations 1cii and 1ciii. *Id.* at 76. Petitioner contends that a skilled artisan “would have appreciated that users of the Sauve-Tsuda tabbed browser would toggle back and forth between the quick pick user-interface and the tabbed browser view multiple times during a web browsing session,” and, thus, “the *capturing* and *texturing* steps of Elements [1.c.ii] and [1.c.iii] are executed anew each time the user calls forth the quick pick user-interface.” *Id.* at 76–77 (citing Ex. 1007 ¶¶ 4–5, 18, 41–42; Ex. 1003 ¶¶ 196–198).

As to limitation 2c, Petitioner argues that this limitation requires the 3D-GUI to revert the replacing step of claim limitation 1dii to re-enter 3D space, and that a skilled artisan “would have appreciated that users of the Sauve-Tsuda tabbed browser would toggle back and forth between the quick pick user-interface and the tabbed browser view multiple times during a web surfing session.” *Id.* at 77 (citing Ex. 1007 ¶¶ 4–5, 18, 39; Ex. 1003 ¶ 199).

Patent Owner argues that the dependent claims “include features that are not disclosed in or suggested by Tsuda and Sauve,” for example “[c]laim[] 2 . . . , which require[s] replacing the active webpage in 2D space with a plurality of images in 3D space, where a third image (of additional information) is captured and textured on the first object in 3D space (2D to 3D mirroring).” PO Resp. 68. Patent Owner does not elaborate on this argument or cite to evidence in support of it. Thus, it is not persuasive.

We agree that claim limitation 16a corresponds to claim limitation 2a and claim limitation 16b corresponds to claim limitation 2c. We find that

Sauve and Tsuda teach the additional limitations of claim 16 based on the evidence Petitioner presents for claim 2.

Claim 17 depends from claim 16 and adds “[17a] receiving a toggle interaction by the end user; and [17b] replacing the window with at least the second and third images within the 3D space in response to the toggle interaction.” Petitioner contends that Sauve and Tsuda teach the additional limitations of claim 17 for the same reasons as given for claim limitations 2c, 3a, and 3b. Pet. 85. Petitioner, in turn, contends that Sauve and Tsuda teach the additional limitations of claim 3 for the same reasons given for claim limitations 2a–2c. *Id.* at 77. We find that Sauve and Tsuda teach the additional limitations of claim 17 based on the evidence Petitioner presents for claims 2 and 3.

Claim 18 depends from claim 17 and adds “[18a] receiving a navigation interaction by the end user; and [18b] moving said second image from the background of the 3D space to the foreground of the 3D space in response to the navigation interaction.” Petitioner contends that Sauve and Tsuda teach the additional limitations of claim 18 for the same reasons as given for claim limitations 4a and 4b. Pet. 85. As to claim 4, Petitioner argues that Sauve teaches that objects in the quick pick user-interface are repositioned in response to a drag-drop operation, and that, in combination with Tsuda, this would have resulted in moving Tsuda’s 3D windows forward or backward through the window stacks. *Id.* at 78 (citing Ex. 1003 ¶ 201).

We agree that claim limitation 18a corresponds to claim limitation 4a and claim limitation 18b corresponds to claim limitation 4b. We find that Sauve and Tsuda teach the additional limitations of claim 18 based on the evidence Petitioner presents for claim 4.

Patent Owner does not present separate arguments for claims 14–18. In sum, we find that Sauve and Tsuda teach each limitation of claims 14–18, and a skilled artisan would have had reasons, with rational underpinning, to combine the teachings of Sauve and Tsuda, with a reasonable expectation of success.

4. Conclusion of Obviousness

In sum, as detailed above, Petitioner’s proposed combination of Sauve and Tsuda teaches each limitation of claims 14–18, but not claims 1–13. A skilled artisan would have had reasons, with rational underpinning, to combine the teachings of Sauve and Tsuda, with a reasonable expectation of success. Patent Owner’s objective indicia of nonobviousness are unpersuasive and entitled to little weight. Upon consideration of all the evidence, we conclude that Petitioner has proved by a preponderance of the evidence that claims 14–18 would have been obvious over Sauve and Tsuda, but has not proved, by a preponderance of the evidence, that claims 1–13 would have been obvious over Sauve and Tsuda.

III. PATENT OWNER’S MOTION TO EXCLUDE

Patent Owner moves to exclude paragraph 79 of Exhibit 1060 (Dr. Fuchs’ Supplemental Declaration), Exhibits 1055 and 1056, which Dr. Fuchs relies on in paragraph 79, and the portions of the Reply that rely on this new evidence (presumably the discussion in Section II.A.2 on pages 18–19). Paper 34. Patent Owner argues that Petitioner uses this new evidence to support an improper new ground of unpatentability presented in its Reply. *Id.* at 1.

Above, we explain that Petitioner’s argument in Section II.A.2 of the Reply, and the evidence in support of it (Exs. 1055, 1056, 1060 ¶¶ 78–80) constitute an improper new prima facie case of obviousness, that Petitioner has forfeited this new argument, and that we disregard this new argument and evidence. Accordingly, we do not consider Exhibits 1055, 1056, and 1060 ¶ 78–80, and we dismiss Patent Owner’s Motion to Exclude as moot.

IV. CONCLUSION⁷

Petitioner has proved by a preponderance of the evidence that claims 14–18 would have been obvious over Robertson, Gralla, and Gettman, and also over Sauve and Tsuda. Petitioner has not proved by a preponderance of the evidence that claims 1–13 would have been obvious. We dismiss as moot Patent Owner’s Motion to Exclude. The outcome for the challenged claims of this Final Written Decision follows. In summary:

Claims	35 U.S.C. §	References/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–18	103(a)	Robertson, Gralla, Gettman	14–18	1–13

⁷ 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*. See 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).

Claims	35 U.S.C. §	References/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–18	103(a)	Sauve, Tsuda	14–18	1–13
Overall Outcome			14–18	1–13

V. ORDER

It is hereby:

ORDERED that claims 14–18 of the '048 patent are unpatentable;

FURTHER ORDERED that claims 1–13 of the '048 patent are not unpatentable;

FURTHER ORDERED that Patent Owner's Motion to Exclude (Paper 34) is dismissed as moot; and

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

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