

Apple Inc. and Google LLC
v.
SpaceTime3D, Inc.

IPR2023-00343 (U.S. Patent No. 9,304,654)

IPR2023-00344 (U.S. Patent No. 9,696,868)

Patent Owner's Demonstrative Exhibits

Oral Argument: March 18, 2024

Overview of the '654 and '868 Patents

(12) **United States Patent**
Bakhash

(10) Patent No.: **US 9,304,654 B2**
(45) Date of Patent: ***Apr. 5, 2016**

(54) SYSTEM AND METHOD FOR DISPLAYING A

(12) **United States Patent**
Bakhash

(10) Patent No.: **US 9,696,868 B2**
(45) Date of Patent: ***Jul. 4, 2017**

(54) SYSTEM AND METHOD FOR PROVIDING
THREE-DIMENSIONAL GRAPHICAL USER
INTERFACE

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(US)

(72) Inventor: **Ezra Eddie Bakhash**, Palo Alto, CA
(US)

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 356 days.

This patent is subject to a terminal dis-
claimer.

(21) Appl. No.: **14/614,708**

(22) Filed: **Feb. 5, 2015**

(65) **Prior Publication Data**
US 2015/0149965 A1 May 28, 2015

(51) **Related U.S. Application Data**

(63) Continuation of application No. 14/503,142, filed on
Sep. 30, 2014, now Pat. No. 9,304,654, which is a
(Continued)

(51) **Int. Cl.**
G06F 3/0481 (2013.01)

G06F 3/0482 (2013.01)
(Continued)

(52) **U.S. CL.**
CPC **G06F 3/04815** (2013.01); **G06F 3/0482**
(2013.01); **G06F 3/04817** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC G06F 3/04815; G06F 3/04817; G06F
3/0482; G06F 3/04845; G06F 17/30572;
(Continued)

(56) **References Cited**
U.S. PATENT DOCUMENTS

5,319,387 A * 6/1994 Yoshikawa G06F 3/0304

5,428,735 A * 6/1995 Kahl G06F 3/0481

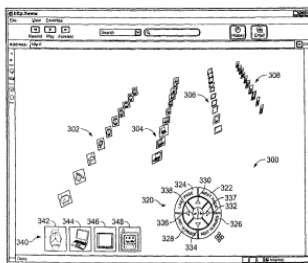
707,999,004
(Continued)

Primary Examiner—Ting Lee
(74) **Attorney, Agent, or Firm**—Fitzsimmons IP Law

(57) **ABSTRACT**

Methods and systems are provided for an improved three-
dimensional graphical user interface. In one embodiment,
the method generally comprises: receiving a plurality of
inputs from a user and opening a plurality of applications in
response thereto, wherein outputs from each application are
displayed (e.g., individually) within a two-dimensional
space. The method further comprises allowing a user to
switch between the plurality of applications by generating
images of each output, and displaying those images (e.g.,
collectively) within a three-dimensional space. The user can
then interact with a particular application by selecting a
corresponding one of the images displayed within the three-
dimensional space. In one embodiment, the method further
comprises replacing the output(s) in two-dimensional space
with the images in three-dimensional space, and replacing
the images in three-dimensional space with the output from
the selected application in two-dimensional space.

20 Claims, 30 Drawing Sheets



- U.S. Pat. No. 9,304,654, entitled “System and Method for Providing Three-Dimensional Graphical User Interface.” (-343 IPR, EX1001)
- U.S. Pat. No. 9,696,868, entitled “System and Method for Providing Three-Dimensional Graphical User Interface.” (-344 IPR, EX1001)
- The '654 and '868 Patents describes (1) a novel 3D GUI where computer outputs (or images thereof) are **open simultaneously in both 2D and 3D space** and (2) a “special system ... to insure [sic] that the end user can interact with the mapped objects in a 3D virtual space with the same responsiveness ... that one would find in a 2D desktop.” *EX1001, 23:10-15.

SPACETIME3D

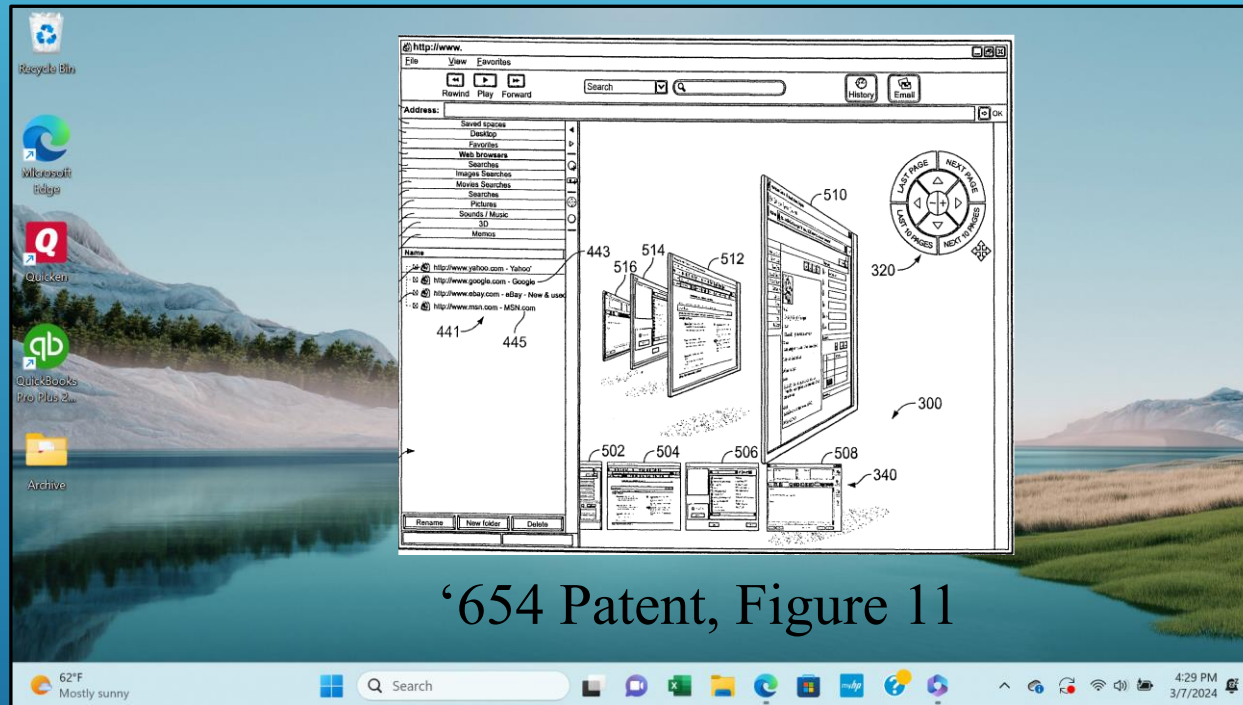
EXHIBIT 2021 - PAGE 2 2

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

**Unless otherwise indicated citations refer to the -343 IPR and '654 Patent but apply equally to the -344 IPR and '868 Patent*

Overview of the '654 and '868 Patents

“the 3D GUI application program will run locally on the computer” (EX1001 at 24:5-7)



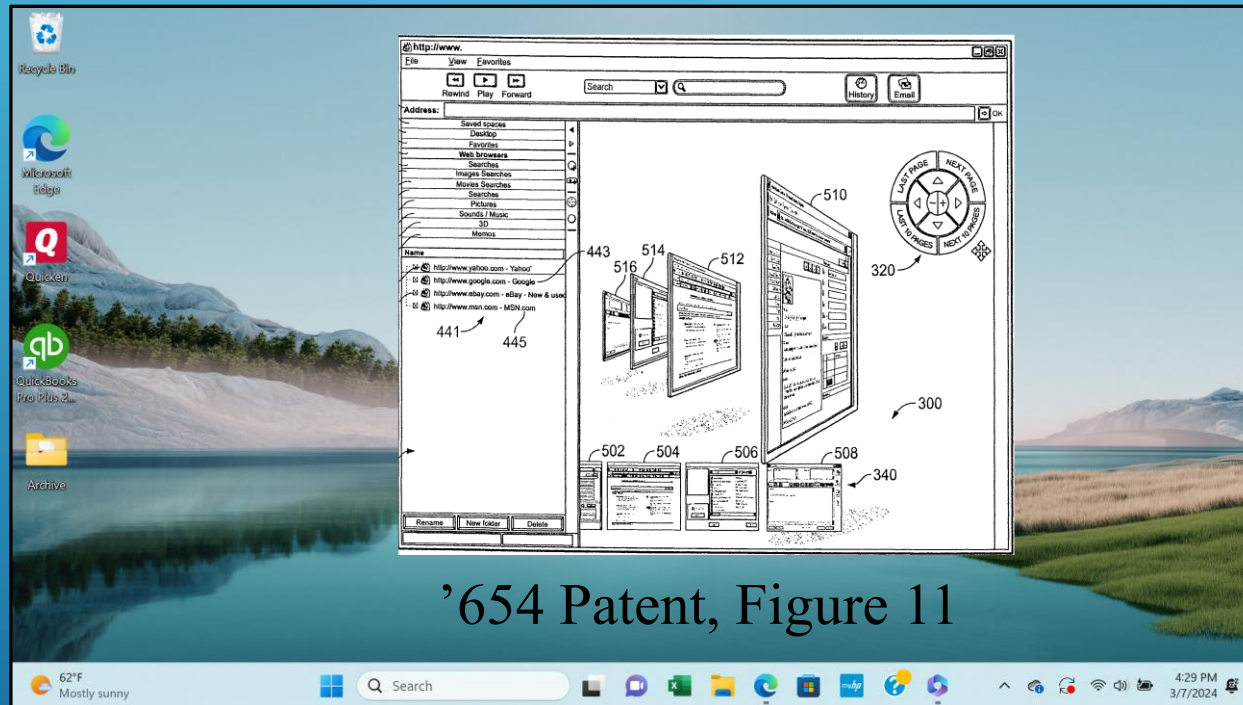
‘654 Patent, Figure 11

In one embodiment, the 3D GUI can run as an Active X control within a browser window on the desktop of a computer (in conjunction with a web-browser program, such as Internet Explorer). In addition, the present invention can run as a stand-alone application or embedded within an HTML page. For example, a 3D virtual space (that was saved in the 3D GUI) of a series of photographs of a model wearing different jewelry styles can be embedded on a jewelry e-commerce site by embedding the code for the Active X control version of the 3D GUI into the markup language of the HTML page according to the syntax for the component.

EX1001 at 5:22-33

Overview of the '654 and '868 Patents

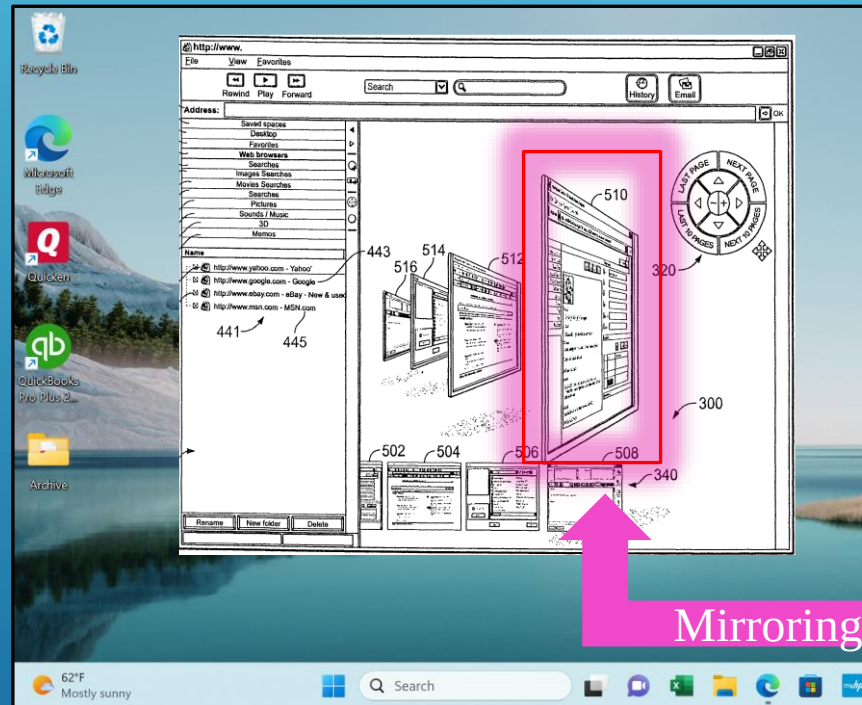
The '654 and '868 Patents Include Both a 2D Desktop and a 3D Virtual Space



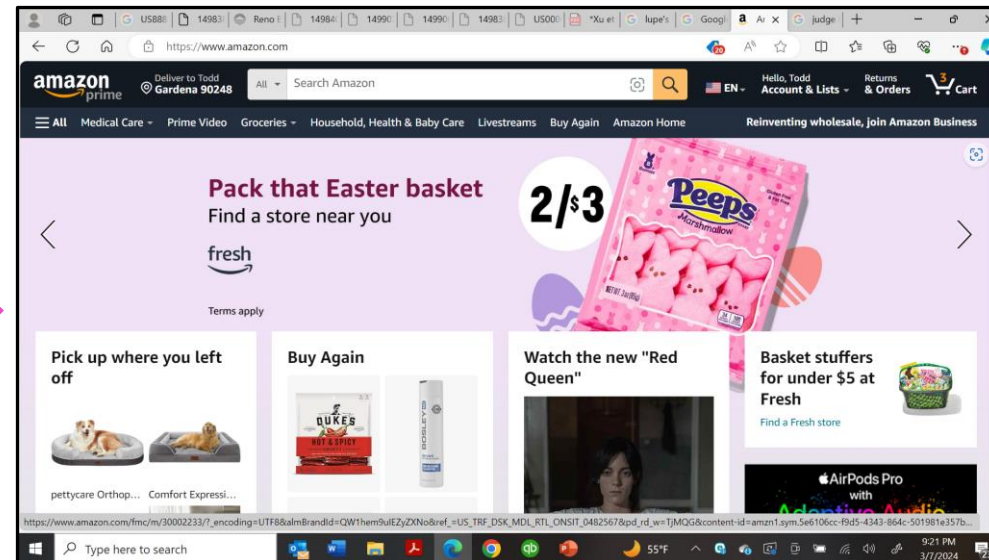
- Images of computer outputs are captured and displayed in the 3D virtual space. See, e.g., EX1001, Fig. 11.
- However, the computer outputs remain open and are either displayed on the 2D desktop or “hidden or drawn off screen.” EX1001, 21:34-47.
- “[T]he output of applications and documents need not be closed, hidden or filed.” EX1001, 21:57-59.

Overview of the '654 and '868 Patents

The '654 and '868 Patents Include Both a 2D Desktop and a 3D Virtual Space



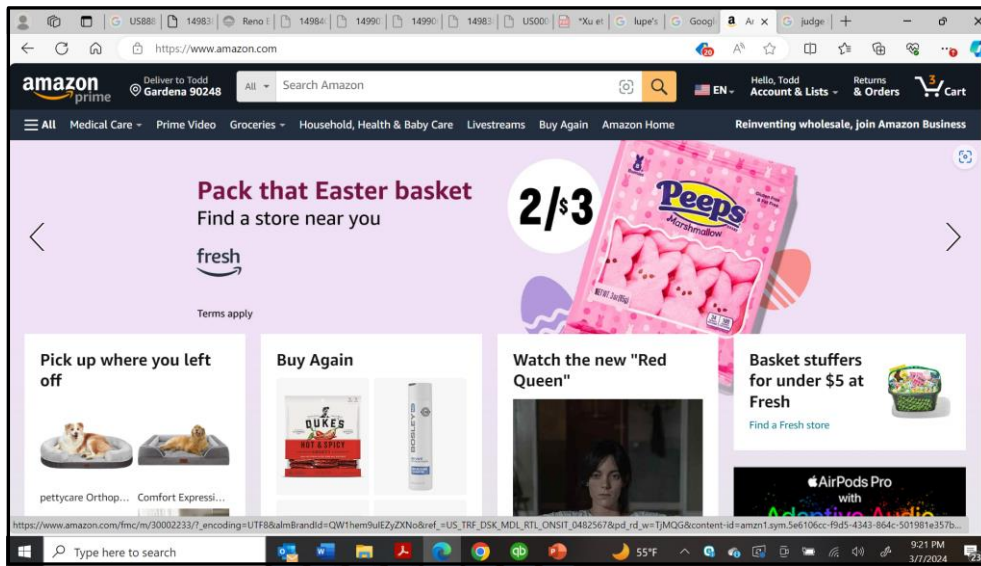
Hidden 2D Desktop



Overview of the '654 and '868 Patents

Rendered (Open) Versions are Critical to Reduce Latency and Ensure Mirroring

Hidden 2D Desktop

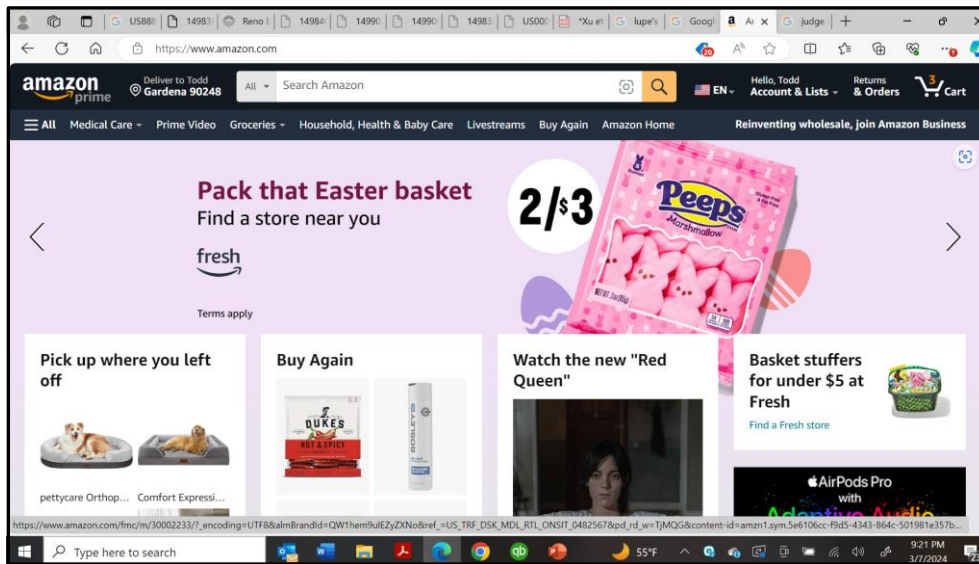


- The '654 and '868 Patents identify “this method or cyclical process of capturing system output and drawing it into a 3D virtual space,” where rendered versions remain open, “is a workaround ... implemented in order to overcome a shortcoming of the operating system to the problem at hand.” EX1001, 24:65-25:2.
- The '654 and '868 Patents provides that “changes to the objects drawn must happen ***quickly*** ... [so] ***the experience feels truly interactive.***” EX1001, 14:8-15. “The 3D GUI application runs in real time ... ***without any time delay*** among the virtual space and the 2D map or operating system API output. This synchronous communication is advantageous as ***too much delay would make the system lag.***” EX1001, 25:14-19.

Overview of the '654 and '868 Patents

Rendered (Open) Versions are Critical to Reduce Latency and Ensure Mirroring

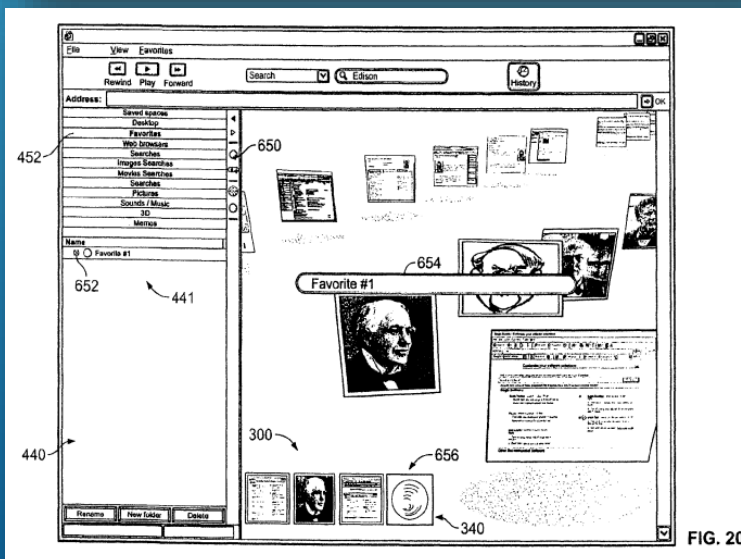
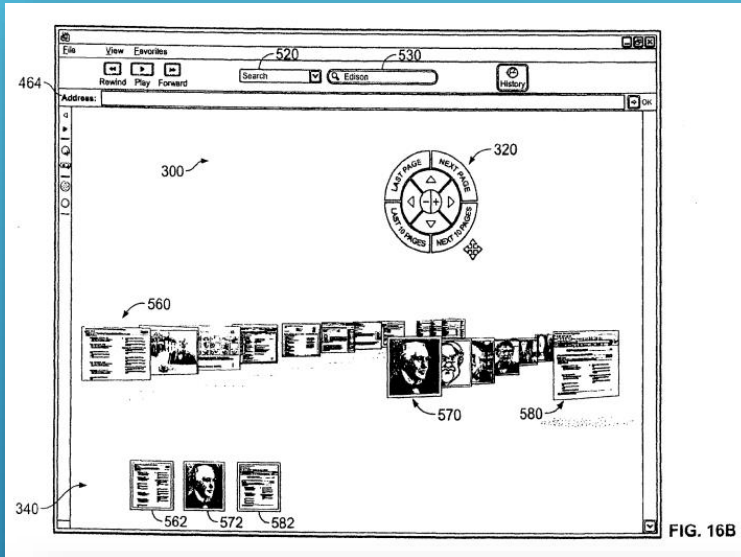
Hidden 2D Desktop



- By keeping the applications open on the hidden 2D desktop and displaying images in 3D space, “the output of applications and documents need not be closed, hidden, or filed.” EX1001, 21:57-67.
- Instead, “[t]hey are staged and can permanently exist visually open (by recording their output in a 3D virtual space) *where they are and how the user last left them.*” *Id.*
- Interacting with an image results in the open application being “revealed” (EX1001, 21:43-47) “allow[ing] the user to resume ‘*where the user last left off.*’” EX2015, [92].

'654 and '868 Patent Disclosures – Importance of Visual History

EX1001, FIGS. 16B and 20



By capturing and displaying images of open applications in 3D space the '654 and '868 Patents provide “a visual history of the user’s computing session, whereby the user can visit past visual computing events (or a snapshot in time) by simply navigating to previously recorded states or viewpoints.” EX1001 at 5:6-11; *see also* EX2001 at [42-43]; POR, 9-15; EX2015, [39]-[48].

To this end, the specification provides that “depth (z) ... is also known as time” and that “[t]his notion of expressing depth or time in a visual computing metaphor is important for the creation of a visual history of the end user’s computer sessions.” EX1001 at 2:14-24.

By plotting images of applications in 3D space, where the application that was last opened or interacted with is displayed in the foreground, the application that was previously opened or interacted with is displayed in a background, and so forth, “the 3D GUI can function as a visual chronological history of the user’s computing session.” EX1001 at 5:6-13; EX2015, [40].

The Challenged Claims are Patentable Over All Instituted Grounds

-343 IPR

Ground 1A (Claims 1-5, 7-8, 10-13,15-17, 19)

- Anthony – U.S. Pub. No. 2005/0088447 (EX1007) in view of
- Hanggie – U.S. Pub. No. 2005/0091596 (EX1006)

Ground 1B (Claims 6, 9, 14, 18)

- Anthony – EX1007 in view of
- Hanggie – EX1006 and
- Matthews – U.S. Pub. No. 2006/0107229

Ground 2A (Claims 1-5, 7-8, 10-13,15-17, 19)

- Hanggie – U.S. Pub. No. 2005/0091596 (EX1006) in view of
- Anthony – U.S. Pub. No. 2005/0088447 (EX1007)

Ground 2B (Claims 6, 9, 14, 18)

- Hanggie – EX1006 in view of
- Anthony – EX1007 and
- Matthews – U.S. Pub. No. 2006/0107229 (EX1008)

-344 IPR

Ground 1A (Claims 1-5, 9-14, and 18-20)

- Anthony (EX1007) in view of Hanggie (EX1006)

Ground 1B (Claims 6-8, 15-17)

- Anthony in view of Hanggie and Matthews (EX1008)

Ground 1C (Claim 7)

- Anthony in view of Hanggie and Matthews and Robertson– U.S. Pat. No. 6,414,677 (EX1009)

Ground 2A (Claims 1-5, 9-14, and 18-20)

- Hanggie in view of Anthony

Ground 2B (Claims 6-8, 15-17)

- Hanggie in view of Anthony and Matthews

Ground 2C (Claim 7)

- Hanggie in view of Anthony and Matthews and Robertson

Summary of PO's Key Contentions for Patentability

- The HAC Combination Does Not Teach or Suggest Displaying Images In 3D Space Based On *“A Last Time That Said User One Of Opened [An] Application And Interacted With [A Corresponding] Object”*
- The HAC Combination Does Not *“Replace Said Plurality Of Images In 3D Space With An Object In 2D Space In Response To Said First Interaction [With One Of Said Plurality Of Images]”*
- There is No Motivation to Combine Hanggie and Anthony as Proposed
- The HAC Combination Does Not *“Receive a Request From Said User to Switch From Said 2D Space to Said 3D Space”* or Perform the *“Replacing”* Step in Response Thereto (Claim 13 of ‘868 Patent).

Applies to all Grounds in the -343 and -344 IPRs: That is, Patent Owner's Arguments Regarding Anthony in view of Hanggie are the same as Hanggie in view of Anthony

HAC Does Not Teach or Suggest the Claimed Ordering of Applications

The HAC Combination Does Not Teach or Suggest Displaying Images In 3D Space Based On “A Last Time That Said User One Of Opened [An] Application And Interacted With [A Corresponding] Object”

Applies to all Grounds in the -343 and -344 IPRs: That is, Patent Owner’s Arguments Regarding Anthony in view of Hanggie are the same as Hanggie in view of Anthony

Claim Construction Dispute – “last time that said user one of”

Claim language	Petitioner’s position	Patent Owner’s position
“displaying said plurality of images in a three-dimensional space on said display device in an order based on a last time that said user one of (i) opened said first application and interacted with said first object, (ii) opened said second application and interacted with said second object, and (iii) opened said third application and interacted with said third object,…” EX1001, 38:5-11	“last time that said user one of” refers to the last time a user <i>opened and interacted with</i> (i) said first application, (ii) said second application, <i>or</i> (iii) said third application That is, the last time said user one of “(i), (ii) or (iii)” EX2019, 47:18-49:9	“last time that said user one of” refers to the last time a user (i) <i>opened a first application or interacted with a first object</i>, (ii) <i>opened a second application or interacted with a second object</i>, and (iii) <i>opened a third application or interacted with a third object</i> That is, the last time said user one of “opened or interacted with” each of the first, second and third applications

Claim Construction – Well-settled Authority re Construing “one of...”

It is well settled that the phrase “one of” followed by two options (opening, interacting), as opposed to a list of more than two terms, is disjunctive, *i.e.*, one of option A or option B

- *NFC Tech., LLC v. Samsung Elecs., Co.*, 2016 WL 1704770, at *15-16 (E.D. Tex. 2016) (construing “**one of a bit and a flag**” to mean “**a bit or a flag**” and noting that “the phrase ‘a bit and a flag’ simply defines the set from which ‘one of’ must be selected.”)
- *3rd Eye Surveillance, LLC v. United States*, 2018 WL 4579926, at *69 (Fed. Cl. 2018) (construing “**one of the additional information and imagery data**” as **disjunctive** because “the content here is not a list, but rather **an option of two**” and “[t]he duality of the term makes it a binary choice between two options.”)

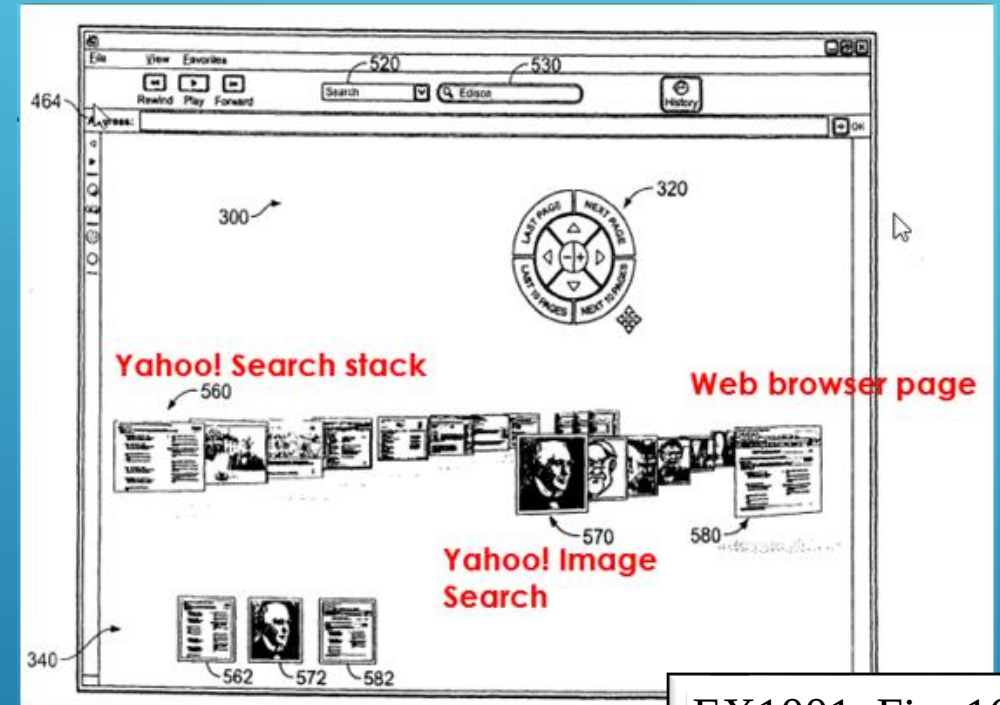
Claim Construction – Construing “one of...”: Specification’s support

Order based on opening an application:

Initially, “an end user selects the helper application called Yahoo! Search ... [which] plots the search result in a unique 3D stack 560, which is represented by in the timeline 340 by an icon 562.” EX1001 at 12:42-53.

Then, “[a]n end user can select another helper application called Yahoo! Image Search ... [which] plots the search results in its own unique 3D stack 570 ... whereby another icon 572 representing stack 570 is added to the timeline (to the right of the last icon 562).” EX1001 at 12:54-65.

Finally, “should an end user create a web-browser page within the virtual space ... the new webpage would be drawn in its own 3D stack 580 ... [and] would add another icon 582 to the timeline (to the right of the last icon 572).” EX1001 at 12:66-13:8.



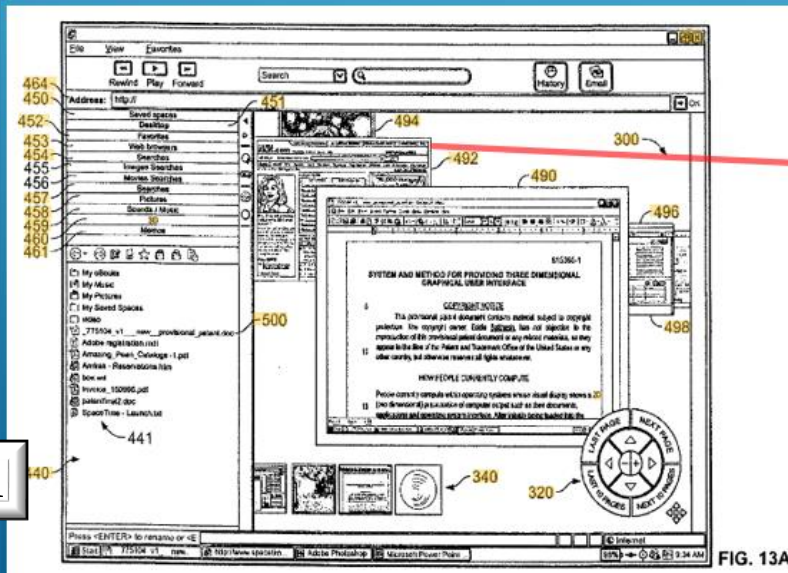
EX1001, Fig. 16B

Claim Construction – Construing “one of...”: Specification’s support

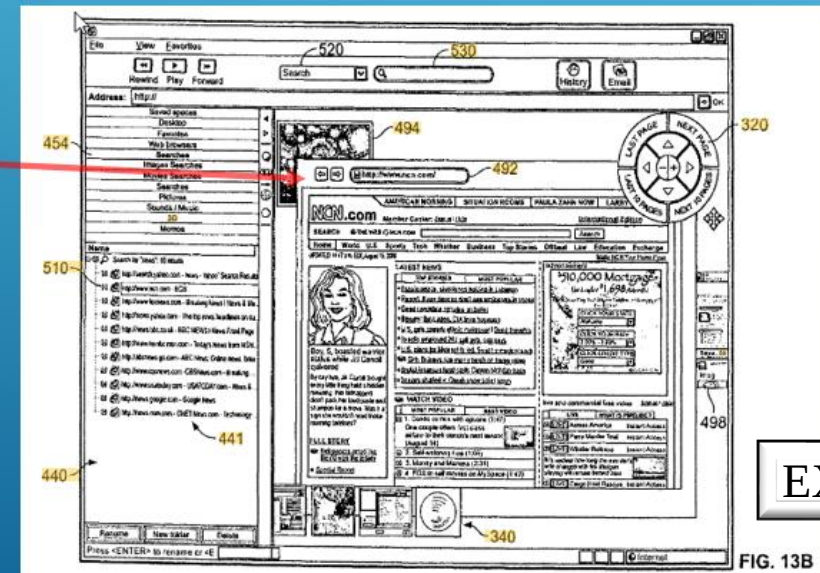
Order based on interacting with an application:

The ordering in 3D space can then be changed based on input from the end user, referred to as a “visual event.” “[E]ach new action, initiated as a result of input from the end user or otherwise initiated by programmatic access, that results in a visual event, is ... plotted as an icon on the dynamic timeline linear map 340,” where “[a] ‘visual event’ refers to a change in appearance in the 3D virtual space.” EX1001 at 11:50-66.

This can be seen in Figures 13A and 13B. The “input from the end user” on, or the “programmatically access” of, the Yahoo! Search application (492) moves the application to the foreground of the 3D space. *Id.* at 11:50-66.



EX1001, Fig. 13A



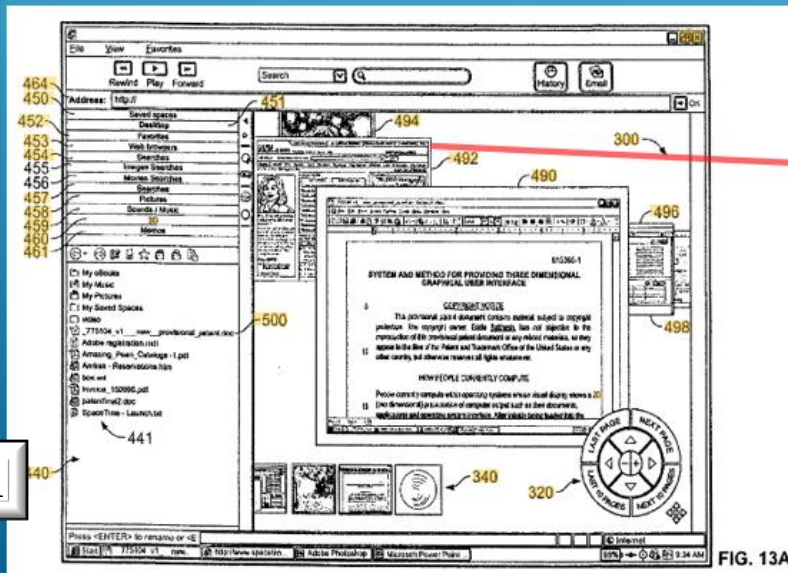
EX1001, Fig. 13B

Claim Construction – Construing “one of...”: Specification’s support

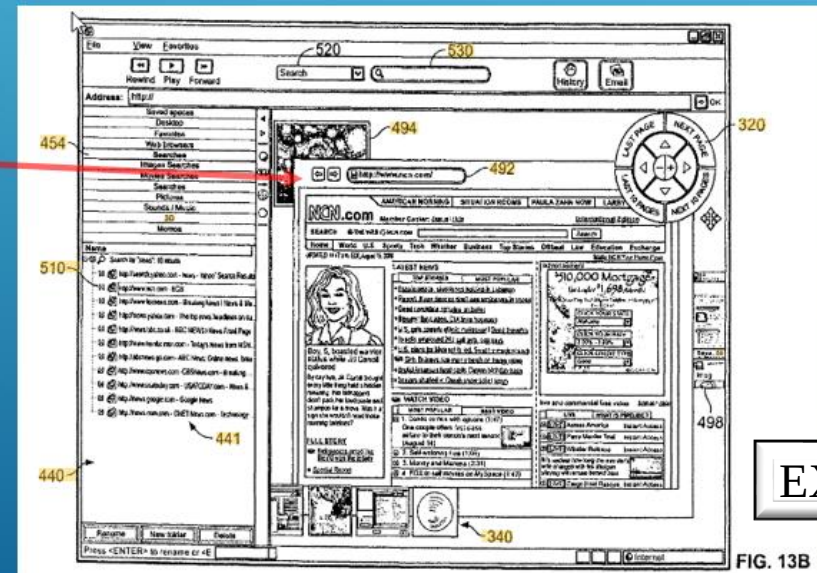
Order based on interacting with an application:

The ordering in 3D space is a “visual event.” “[E]ach new action, initiated by a user, that results in a visual event” where “[a] ‘visual event’ refers to a change in the 3D space of the graphical user interface.” Thus, the correct construction of “a last time that said user **one of** opened said application **and** interacted with said object” is “a last time that said user opened said application **or** interacted with said object.”

This can be seen in Figures 13A and 13B. The “input from the end user on, or the “programmatically access” of, the Yahoo! Search application (492) moves the application to the foreground of the 3D space. *Id.* at 11:50-66.



EX1001, Fig. 13A



EX1001, Fig. 13B

Claim Construction – Petitioner’s Construction is Wrong

Petitioner’s and Dr. Fuchs interpretation to mean “a last time” the user (i), (ii) or (iii) leads to displaying only the last application of the three, reading out “displaying said *plurality* of images” and the claimed order.

Q. So as I understand your response, Dr. Fuchs, you used "one of" to modify either small roman numeral i, ii, or iii; is that right?

A. I believe that my understanding is "said user one of," i, ii, or iii.

EX2019, 47:18-49:9

“*displaying said plurality of images* in a three-dimensional space on said display device in an order based on ***a last time that said user one of*** (i) opened said first application and interacted with said first object, (ii) opened said second application and interacted with said second object, and ***[or]*** (iii) opened said third application and interacted with said third object, ~~such that a first one in said order is displayed in a foreground of said three-dimensional space, a second one in said order is displayed in a background of said three-dimensional space, behind at least said first one in said order, and a third one in said order is displayed in a background of said three-dimensional space, behind at least said second one in said order...~~” EX1001 at 38:5-18

Claim Construction – Petitioner’s Construction Reads Out Claim Elements

First application



Second application



Third application

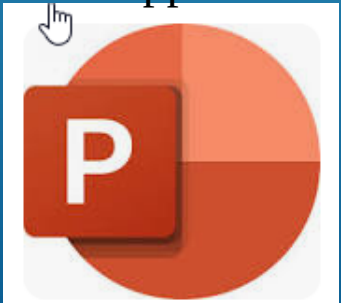
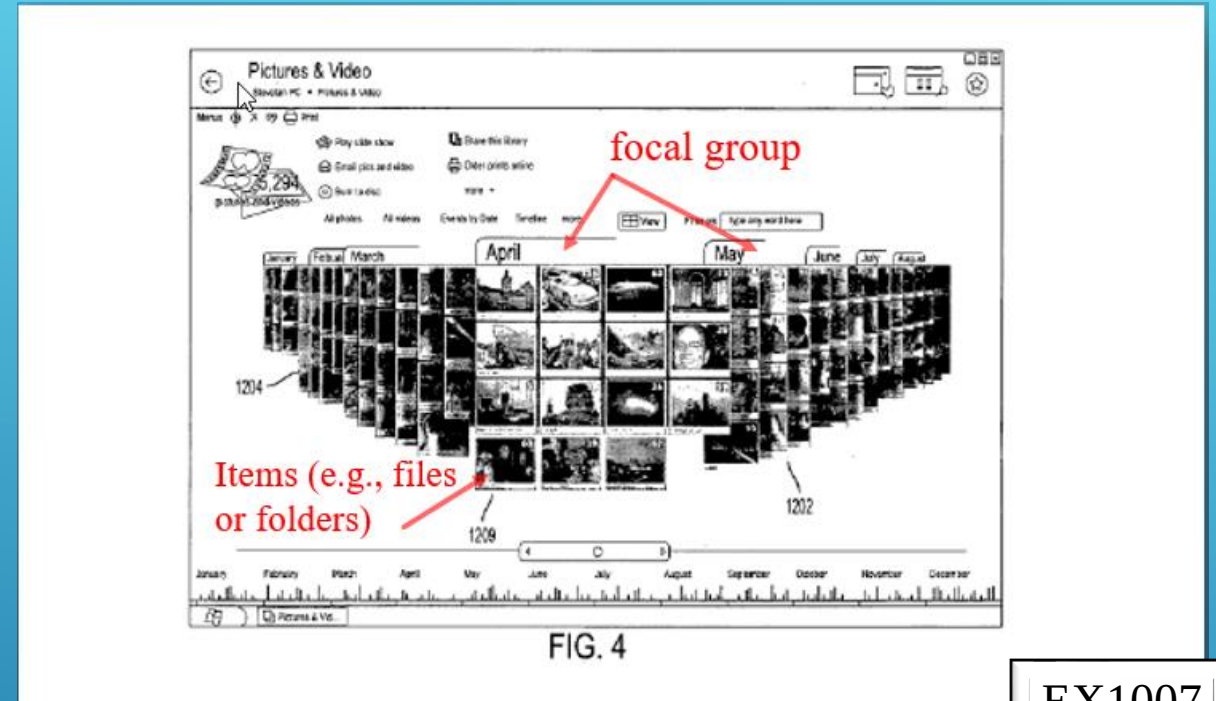


Image of a last time that said user opened and interacted with either the first, second or third application

*“displaying said plurality of images in a three-dimensional space on said display device in an order based on **a last time that said user one of** (i) opened said first application and interacted with said first object, (ii) opened said second application and interacted with said second object, and **[or]** (iii) opened said third application and interacted with said third object, such that a first one in said order is displayed in a foreground of said three-dimensional space, a second one in said order is displayed in a background of said three-dimensional space, behind at least said first one in said order, and a third one in said order is displayed in a background of said three-dimensional space, behind at least said second one in said order...”* EX1001 at 38:5-18

Anthony Discloses Ordering of Files and Folders

- There is no dispute that Hanggie does not disclose any ordering.
- Petitioner relies only on Anthony for the Claimed Ordering. Pet. 48-49.
- Anthony does not teach ordering of applications or *when individual applications were opened*.
- As shown in Figure 4, Anthony discloses files or folders are presented in a “dynamic timeline” in a 3D environment, where the items are placed “in some logical order using an attribute shared by each of the items.” EX1007 at [0011].
- One item in the group (*e.g.*, a file or a folder) is designated by the user (*e.g.*, by clicking on it) as “a focal group” and “the focal group 509 may be placed in the front and center of the GUI view.” “The remainder of the groups are displayed on either side of the focal group based on their ordering ... such that ... [they] appear to be less prominent to the user than the focal group.” EX1007 at [0011] and [0012].

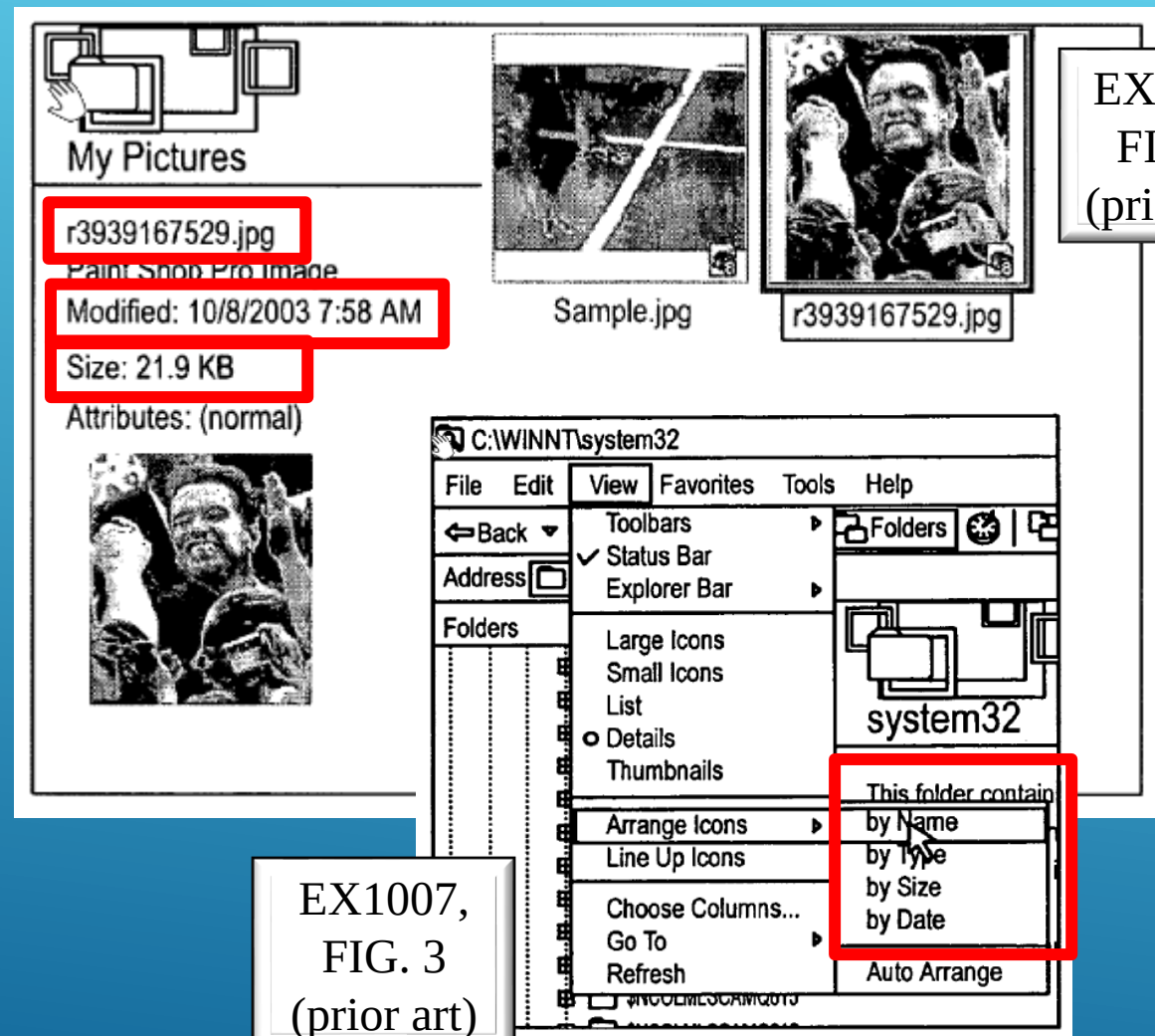


EX1007

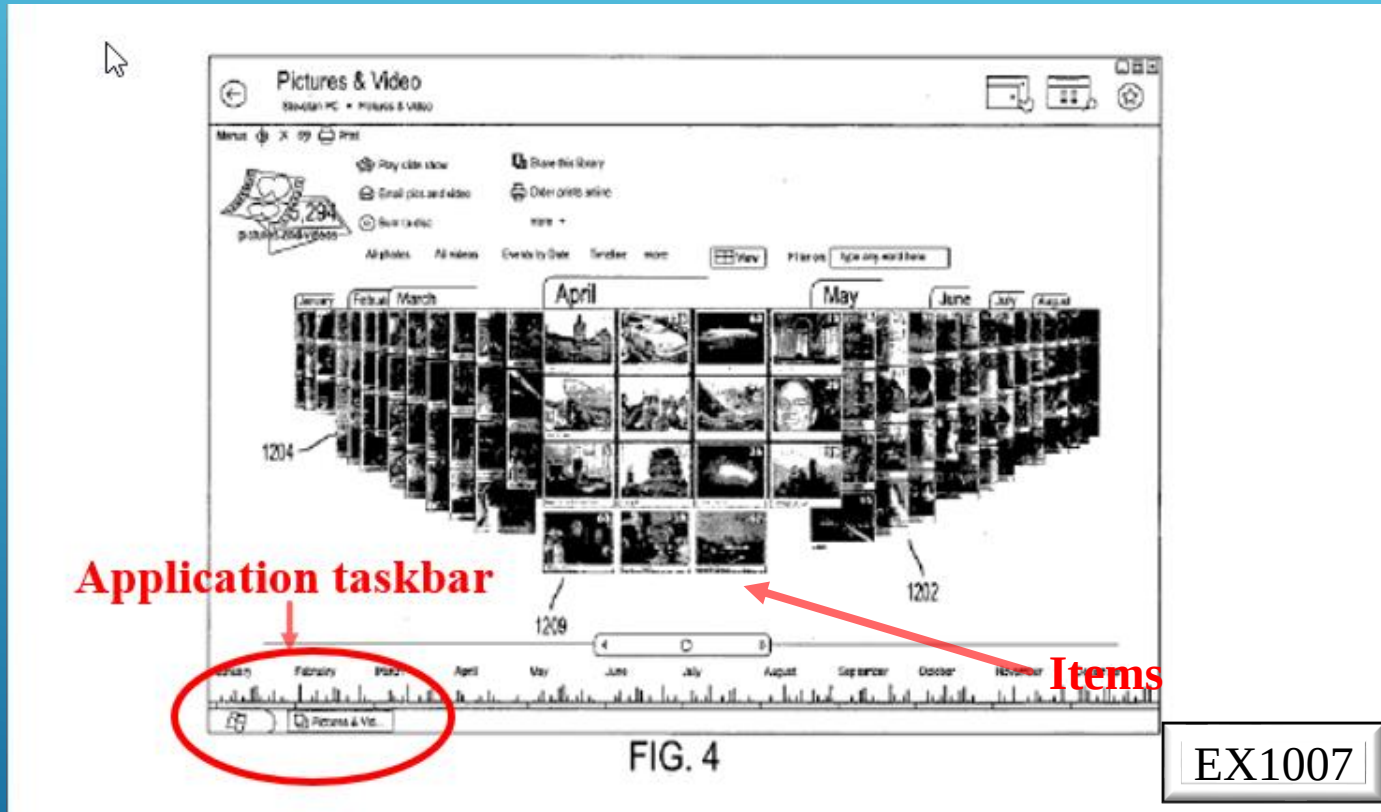
Anthony Teaches Ordering by an Items' Attributes

“Attributes or properties of items include attributes or properties of the files, folders, or virtual folders, etc., that they represent and may further include aspects of the Visual representation itself. For example, item properties may include, but are not limited to, *name, file size, date of creation, modified date, author, title, read-only, archived, hidden, personal, type, and the like*. Any item property may be used as an ordering attribute according to various aspects of the present invention...For example, a user may wish to group items by item type, or author, or some other attribute. In one embodiment of the present invention, *the ordering attribute may be based on time, thus arranging the items chronologically, e.g., by using a date of creation or date of edit attribute* as the ordering attribute.” EX1007 at [0042]

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Anthony's Items Do Not Include Applications

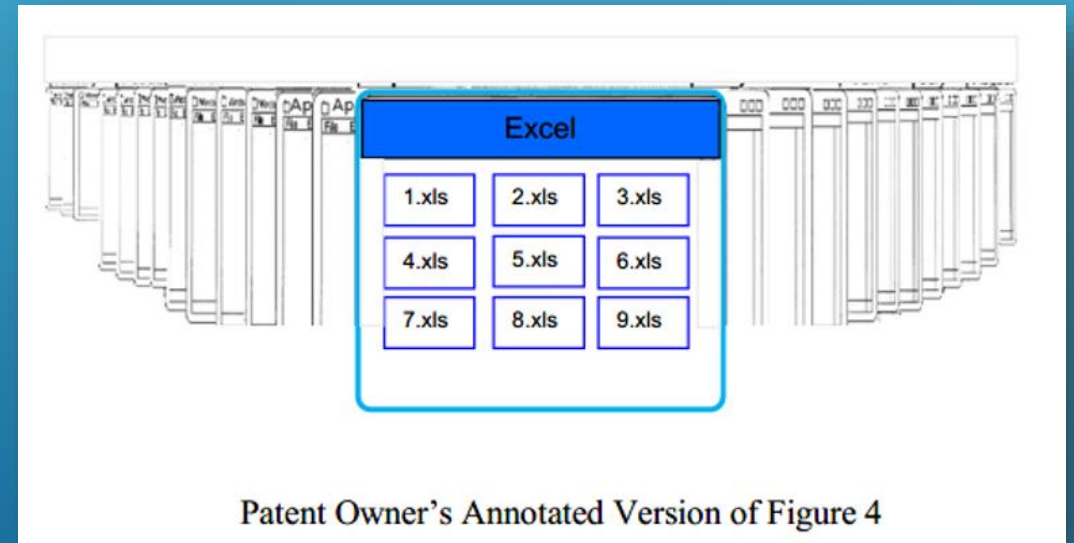


“As hard disk space becomes less expensive, users are able to store increasing numbers of **photographic images** (and other types of computer image **files**) on the hard drive of their computers. Because of the increased number of images, **it has become more difficult for users to manage and organize the graphics files that contain the images.** For example, in a **folder with hundreds of picture files** it can be difficult to find a **particular image file**. This is especially the case where the **filename** is not indicative of the contents of the picture **file**.” EX1007 at [0004].

First Reason: Anthony Teaches Organizing By *File Type*

First Reason why Petitioner's argument doesn't work: Anthony discloses that it is “*data objects*” (e.g., digital photographic images, etc.) that are arranged based on the ordering attribute, not applications.

- Anthony is for displaying “files and folders.” EX1007, Abstract (“[a] three-dimensional (3D) view of a data collection based on an attribute is disclosed. A timeline is provided for displaying files and folders.”)
- Anthony does provide that “file type” allows the user to locate “files or folders” for a particular application. EX1007, [0042], [0049]
- As Dr. Schaefer illustrates, a more accurate annotation of Figure 4 would be this illustration, thereby allowing a user to more easily locate files or folders for a particular application. EX2015 at [95]
- But this does not take into account when a particular application (e.g., Excel) was last opened (as opposed to Word, etc.).



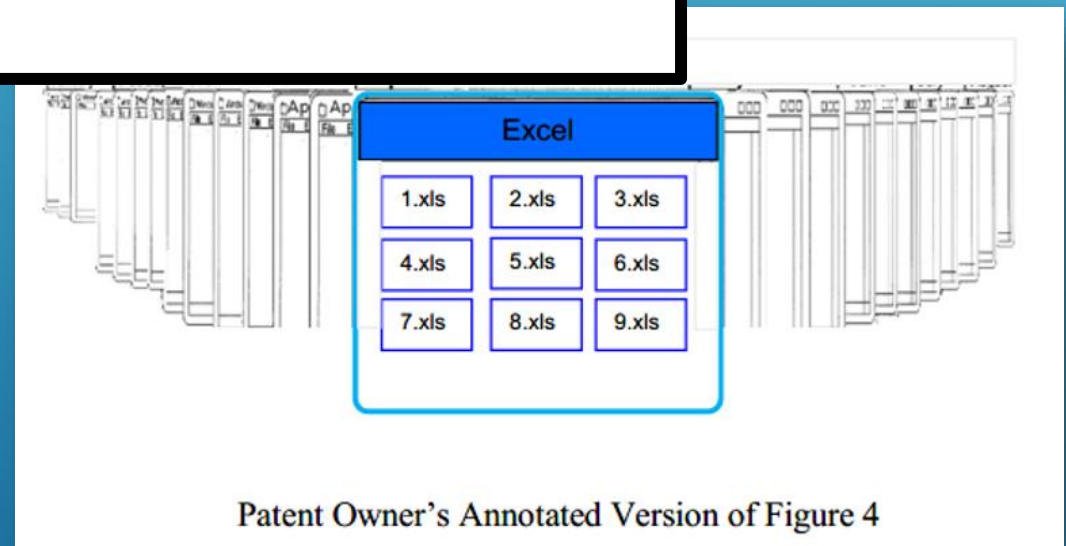
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- Anthony is for displaying “files and folders.” EX1007, Abstract (“[a] three-dimensional (3D) view of a data collection based on an attribute is disclosed. A timeline is provided for displaying files and folders.”)

- Anthony application ***As such, the resulting arrangement is not indicative of when an application was opened and when the object (content) was subsequently interacted with.*** for a particular

- As Dr. Schaefer illustrates, a more accurate annotation of Figure 4 would be the illustration above, thereby allowing a user to more easily locate files or folders for a particular application.



Second Reason: Anthony Does Not Teach When the Application Was Opened or an Object Was Interacted With

Second Reason why Petitioner's argument doesn't work: Ordering according to Anthony's attributes is not the claimed ordering of applications based on *a last time that each application was opened or interacted with* by the user.

- Petitioner's argument that an interaction with a file or window is an interaction with the application misses the point as a user can open an application without interacting with a file or window. Reply at 13 ("PO fails to explain how a user's interaction with an application window (e.g., Excel or Word window)...is not an interaction with the application itself.").
- Petitioner claims that Dr. Schaefer corroborated that "interacting with an application window (file) is also interacting with the application." Not true.
- Dr. Schaefer testified that opening an application is separate and distinct from interacting with a file.

Q. [I]f a computer were to open an Excel Microsoft application, does the computer have to open an Excel file?

A. No, it doesn't have to open an Excel file.

Q. So how would it open the Excel application then?

A. Well, the standard way you might do that is by selecting the icon for Excel from maybe the start menu, or double clicking on a shortcut, or something to that effect.

EX1031 at 63:10-23

Second Reason: Anthony Does Not Teach When the Application Was Opened or an Object Was Interacted With

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Petitioner's assumption does not take into account when an application is merely opened.

- Petitioner's argument that "interacting with an application window (file) is also interacting with the application." Not true.
- Dr. Schaefer testified that opening an application is separate and distinct from interacting with a file.

A. No, it doesn't have to open an Excel file.

Q. So how would it open the Excel application then?

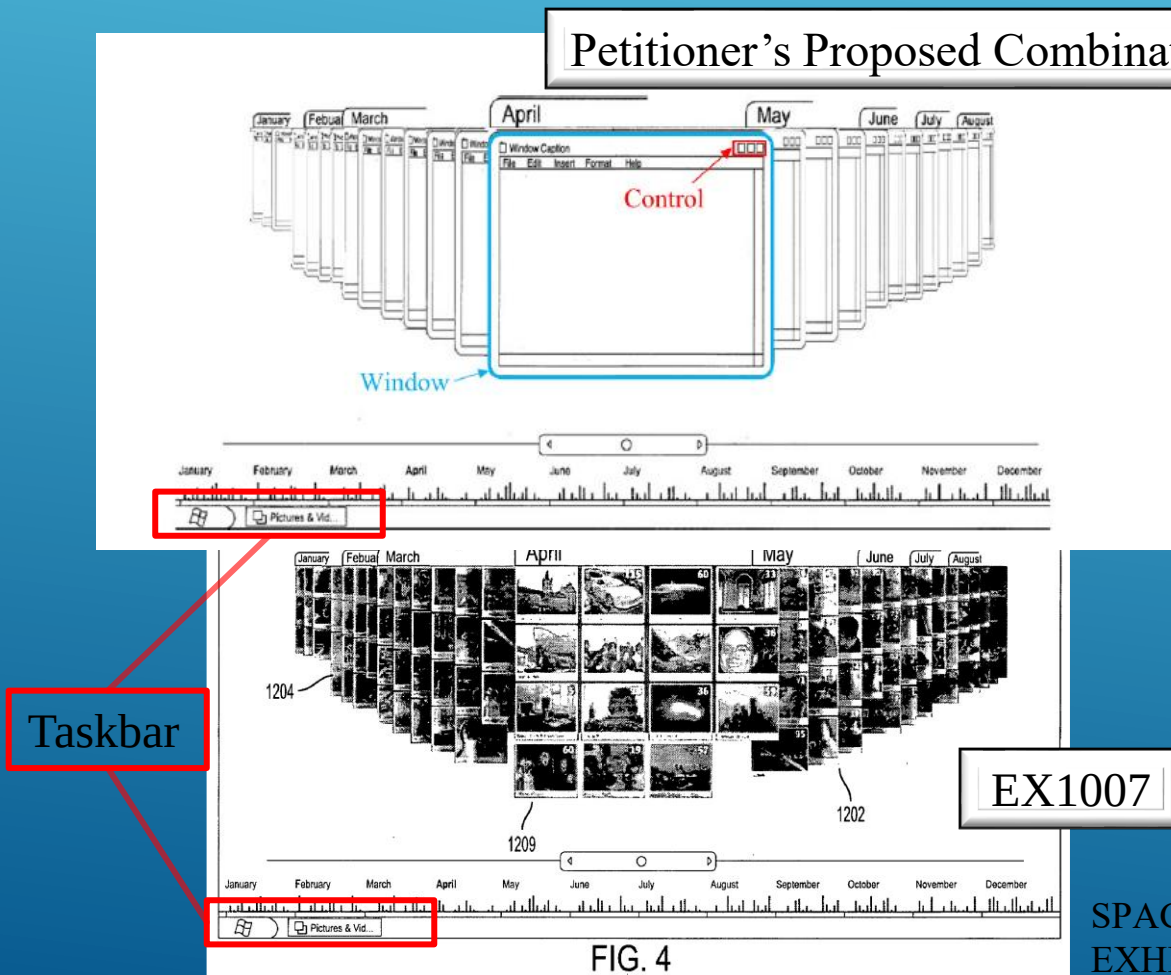
A. Well, the standard way you might do that is by selecting the icon for Excel from maybe the start menu, or double clicking on a shortcut, or something to that effect.

EX1031 at 63:10-23

HAC Does Not Teach or Suggest the Claimed Ordering of Applications

Petitioner's proposed combination illustrates that the items are arranged ***based on the attributes of data file*** (created, edited, file type, etc.), not when applications were opened

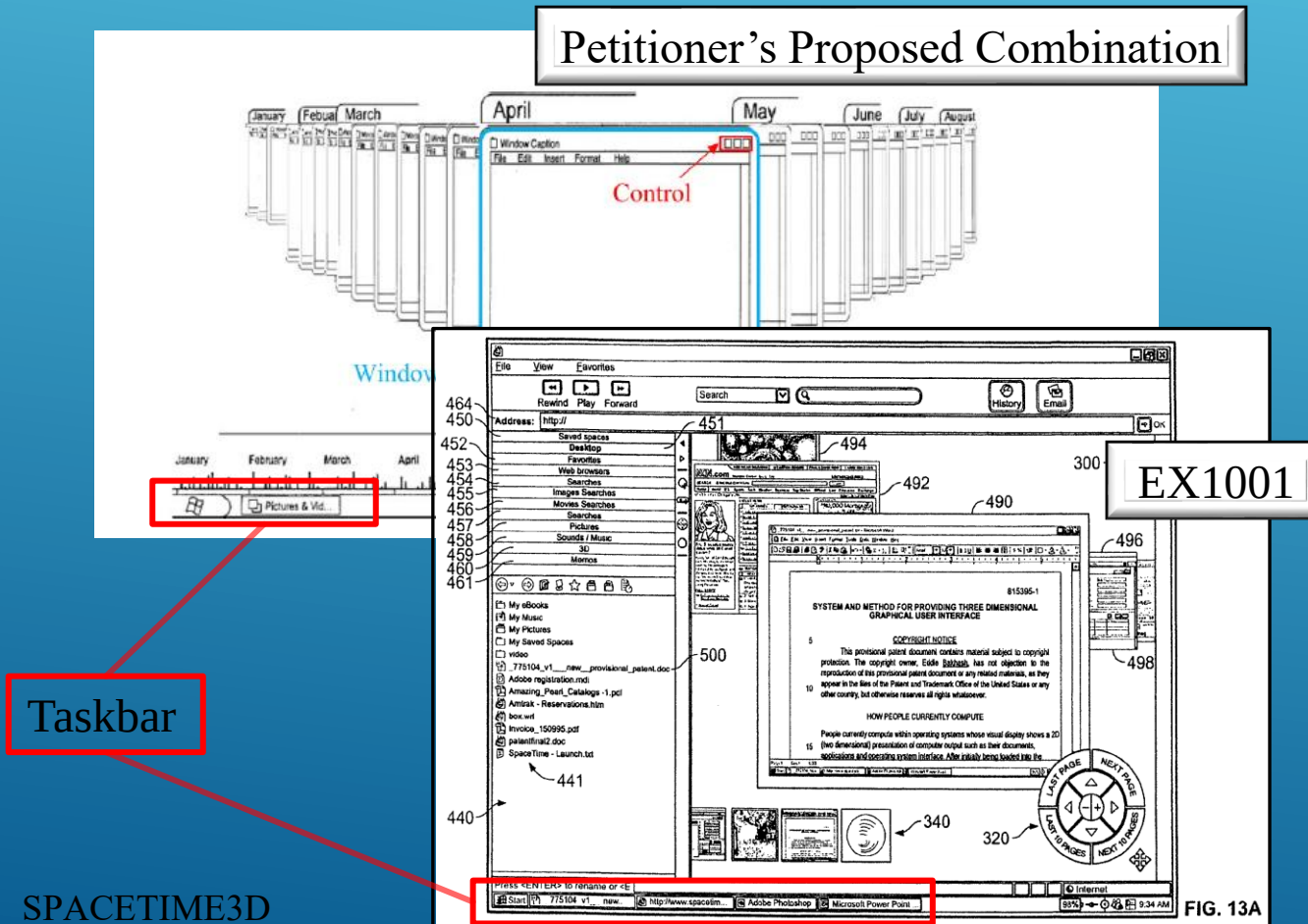
- The order in which ***applications are opened*** are ***presented on the taskbar*** in both Anthony and Petitioner's proposed combination.
- As Dr. Schaefer explained, “[t]his is because the number of open applications is negligible compared to the number of files stored on the computer.” EX2015, [70].



HAC Does Not Teach or Suggest the Claimed Ordering of Applications

Petitioner's response to this is that in the '654 Patent, the open applications are not presented on the taskbar. Reply, 17-18 (citing to Figure 13A).

- This is exactly the point—in the ‘654 Patent, images are arranged in 3D space based (in part) on *when each individual application was opened*. As such, there is no need to list open applications on the taskbar.
- In the proposed combination, however, images are arranged in 3D space based on *when individual data files were opened*, edited, etc. The timeline does not take into account when individual applications were opened as that is the traditional purpose of the taskbar, as confirmed by Anthony.



HAC Does Not Teach or Suggest the Claimed Ordering of Applications

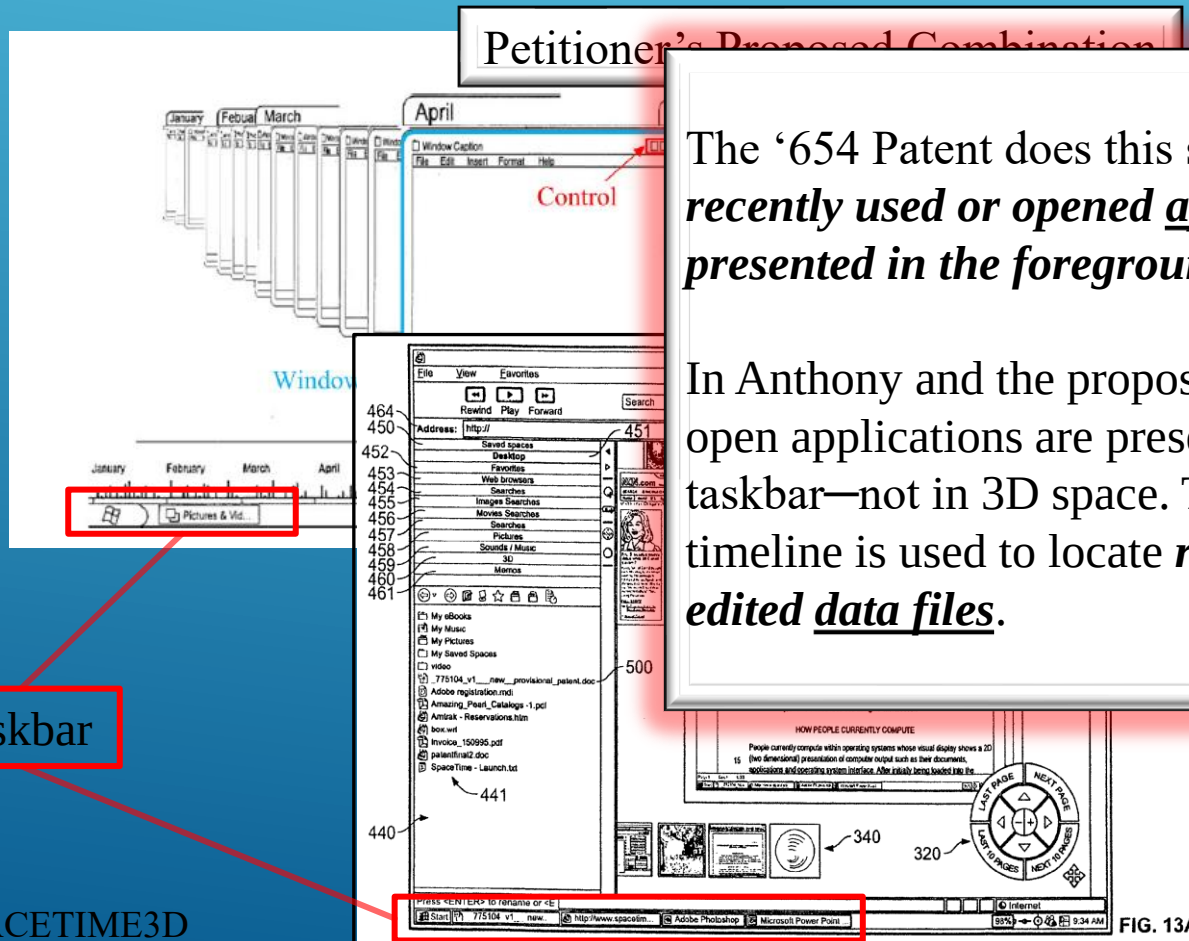
Petitioner's response to this is that in the '654 Patent, the open applications are not presented on the taskbar. Reply, 17-18 (citing to Figure 13A).

- This is exactly the point—in the '654 Patent, images are arranged in 3D space based on when each individual application was opened. As such, there is no need to list applications on the taskbar.

The '654 Patent does this so that *the most recently used or opened applications are presented in the foreground of 3D space.*

In Anthony and the proposed combination, the open applications are presented on the taskbar—not in 3D space. This is because the 3D timeline is used to locate *recently created or edited data files.*

taskbar.



Summary Why HAC Does Not Teach or Suggest the Claimed Ordering

- *“a last time that said user one of”* refers to a last time of *“opening an application”* or *“interacting with an object”*
 - Case law supports PO’s construction
 - Specification supports PO’s construction
 - Petitioner’s construction impermissibly reads out claim limitations
- Anthony’s “items” are files or folders, not applications.
- Anthony’s file and folder attributes do not take into account when an application was last opened.
- Dr. Schaefer explained that interacting with an application window (file) is distinct from when an application is opened. Petitioner’s interpretation reads out “opening an application” and wrongly reduces the claim to “interacting with an object”

In short, the HAC combination does not teach or suggest the claimed ordering of applications limitation.

Summary Why HAC Does Not Teach or Suggest the Claimed Ordering

- *“a last time that said user one of”* refers to *“opening an application”* or *“interacting with an object”*
 - Case law supports PO’s construction
 - Specification supports PO’s construction
 - Petitioner’s construction impermissibly reads out claim terms
- Anthony’s  *For this reason alone the Board should find the Challenged Claims not obvious over All Grounds*
- Anthony’s *application* was last opened.
- Dr. Schaefer explained that interacting with an application window (file) is distinct from when an application is opened. Petitioner’s interpretation reads out “opening an application” and wrongly reduces the claim to “interacting with an object”

In short, the HAC combination does not teach or suggest the claimed ordering of applications limitation.

HAC Does Not Teach or Suggest the Claimed Replacing Images

The HAC Combination Does Not “Replace Said Plurality Of Images In 3D Space With An Object In 2D Space In Response To Said First Interaction [With One Of Said Plurality Of Images]”

Applies to all Grounds in the -343 and -344 IPRs: That is, Patent Owner’s Arguments Regarding Anthony in view of Hanggie are the same as Hanggie in view of Anthony

Claim Construction Dispute – “image”

Claim language	Petitioner’s position	Patent Owner’s position
“replacing said plurality of images within said three-dimensional space with one of said first, second, and third objects corresponding to said one of said plurality of applications within a two-dimensional space in response to said first interaction [with one of said plurality of images]” EX1001, 37:61-38:4	“[T]he images in 3D are fully interactive and function the same or similar manner as the corresponding objects in 2D space” Reply at 4.	The plain and ordinary meaning of an image in the context of computers, <i>e.g.</i>, bitmap, JPEG, screenshot, thumbnail, etc.—in essence “an optical counterpart of an object produced by ... an electronic device.” Sur-reply at 14-15 (citing EX1029).

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“replacing said plurality of images within said three-dimensional space with one of said first, second, third objects corresponding to said one of said plurality of applications within said three-dimensional space in response to said first interaction [with one plurality of images]” EX1001, 37:61-38:4	“[T]he images in 3D are fully interactive and function the same or similar Petitioner’s construction is based on statements in the ‘654 Patent that images are “fully interactive and functional.” Reply, 2-4. What Petitioner fails to address is <i>how</i> this “functionality” is accomplished.	The plain and ordinary meaning of an image in the context of computers, <i>e.g.</i>, FIG. screenshot, etc.—in essence a counterpart of an image produced by ... an image device.” at 14-15 (citing

Claim Construction – “image”: Specification supports PO’s construction

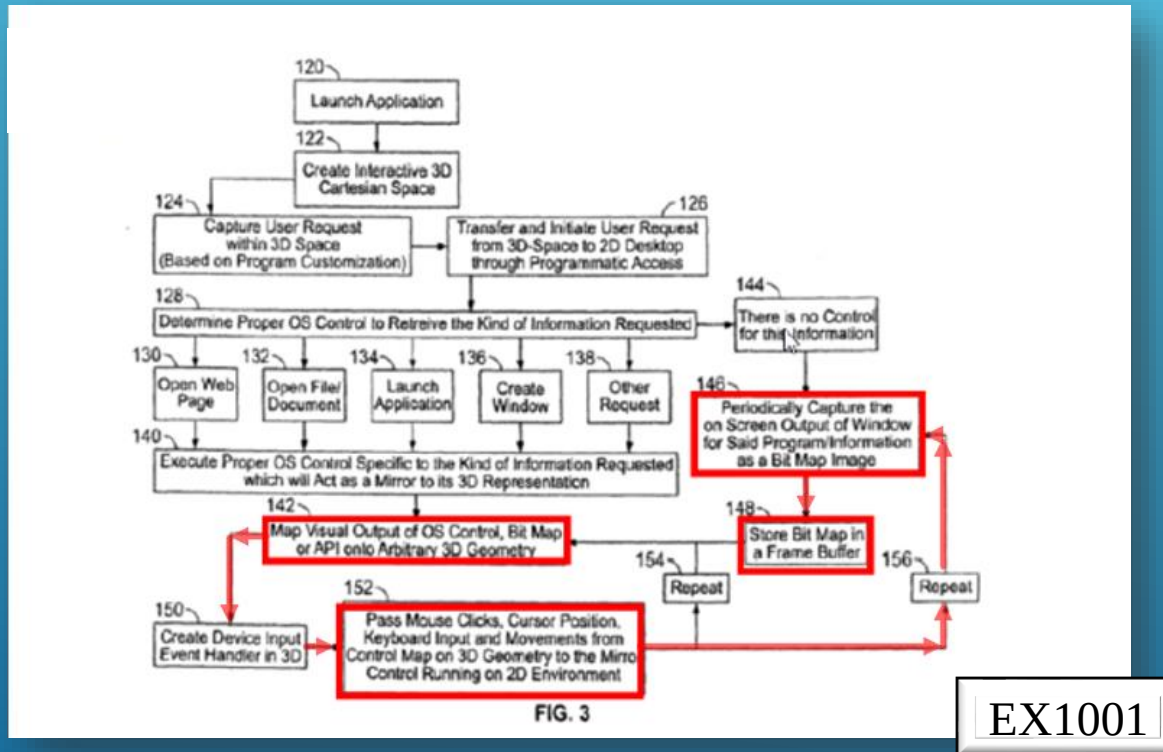
First way of providing functionality: *mapping interactions to the off-screen 2D output*

“Webpages, unlike pictures that the end user simply view, require interactivity to function properly in a virtual space. Because the viewpoint of an end user within a 3D interactive virtual space can change, so to do the shapes and sizes of the objects being drawn change based on the end user's navigation within the virtual space. If the objects being drawn within a 3D virtual space having operating system output such as controls mapped onto them, ***a special system must be created to insure that the end user can interact with the mapped object in a 3D virtual space with the same responsiveness of input and output that one would find in a 2D desktop.***” EX1001 at 23:5-23.

“Thus, for example, if the user is presented with an image of a first page (or home page) of a website on the first window, and the user interacted with the image in an effort to interact with (or click) a link to a second page of the website, ***the processor module will map the interaction to the location on the rendered website to identify the corresponding link.*** The processor module will then use that link to request the second page of the website. The processor module will then render the second page (e.g., using a web browser, etc.), capture an image (e.g., bitmap, etc.) of the rendered second page, and texture the image of the second page on the first window, thereby replacing the image of the first page.” EX2003 at 76.

Claim Construction – “image”: Specification supports PO’s construction

First way of providing functionality: *mapping interactions to the off-screen 2D output*



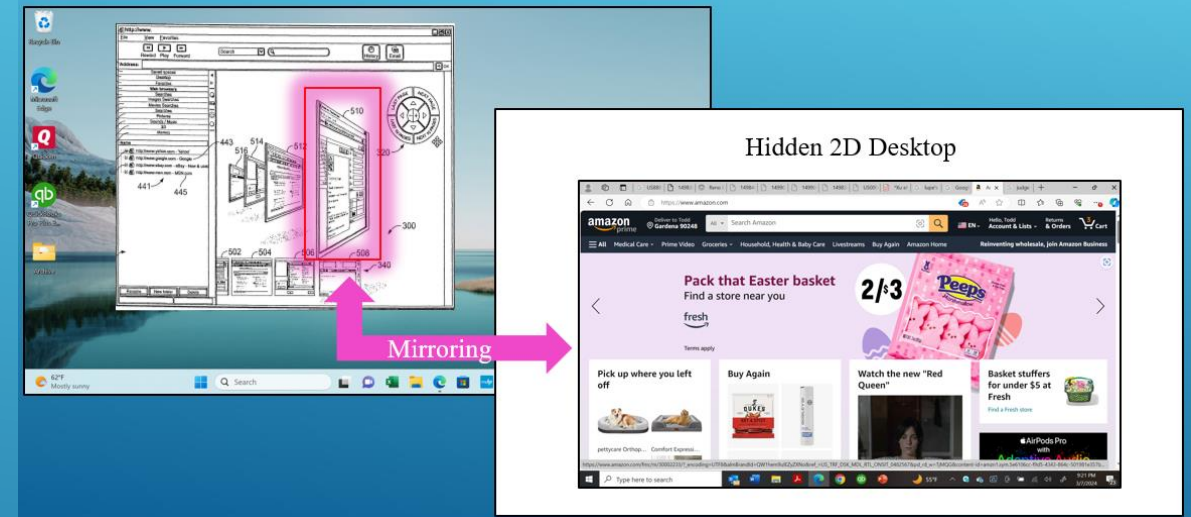
EX1001

The specification goes on to describe a “visual bridge of information” that is reflected in Figure 3, where the system “periodically capture[s] the on screen output of [a] window ... as a bit map image.” EX1001, Fig. 3, 146. The “bit map” is then stored (148) and mapped “onto arbitrary 3D geometry (142). *Id.*, 148, 142. If the image is interacted with, the system “pass[es] mouse clicks, cursor position, keyboard input and movements from control map on 3D geometry to the mirror control running in 2D environment.” *Id.*, 152.

Claim Construction Dispute – “image”: Specification support

Second way of providing functionality : ***reveal the off-screen 2D version of the application***

“[T]he 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.***” EX1001 at 21:37-47.



Claim Construction Dispute – Petitioner’s Construction is Wrong

Petitioner’s construction that “images” include “application windows” is not supported.

- Petitioner’s construction that “the images in 3D are fully interactive and function the same or similar manner as the corresponding objects in 2D space” is not the correct construction.
- Arguing that “images” and “objects” are the same violates the presumption that “[d]ifferent claim terms ... have different meanings.” *Bd. of Regents of the Univ. of Tex. Sys. v. BENQ Am. Corp.*, 533 F.3d 1362, 1371 (Fed. Cir. 2016).
- Petitioner argues that “[a]ny characterization of the functionality of images corresponding to applications in the 3D space necessarily being different from objects in 2D space is not supported by the ‘654 specification.” Reply, 3. Not true. The ‘654 specification provides that images of objects (*e.g.*, bitmaps) are different (functionally) from the objects themselves, which are open on the 2D desktop.

Claim Construction Dispute – Petitioner’s Construction is Wrong

Petitioner’s construction that “images” include “application windows” is not supported.

- As noted, the Asserted Patents specifically refer to the images as “bit mapped images.” EX1001, FIG. 3 (142, 146, 148).
- Despite this, Petitioner’s expert testified that his interpretation upon which Petitioner relies (Reply at 8) of “image” is “very different” from a “JPEG” or “bit mapped image.” EX2019 at 54:6-16; 55:8-21.
- Construing “images” in 3D GUI as being fully interactive in the same manner as objects in 2D GUI effectively eliminates any distinction in the claim language requiring “**replacing** said **plurality of images** within said three-dimensional space **with** one of said first, second, and third **objects**...”
- Petitioner’s reliance on Xu (EX1030) is unavailing because Xu discloses “windows,” not images. EX1030, FIG. 4A-4F; EX2019 at 50:21-52:22.
- Xu supports PO’s construction that “image data” is “a bitmap image” or “JPEG image”. EX1030 at 16:53-57; Sur-reply at 19.

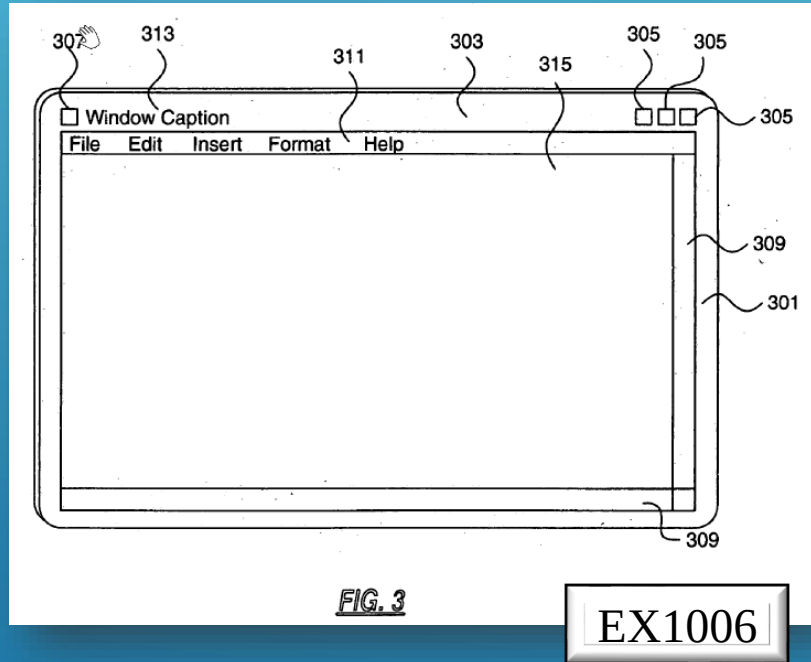
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- Const *The Challenged Claims do not equate “images” with “objects” (application windows) – “images” are an optical counterpart of an object produced by...an electronic device (e.g., bitmap, JPEG, screenshot, thumbnail, etc.).* EX2019 at 54:6-16; 55:8-21.
- Petitioner’s reliance on Xu (EX1030) is unavailing because Xu discloses “windows,” not images. EX1030, FIG. 4A-4F; EX2019 at 50:21-52:22.
- Xu supports PO’s construction that “image data” is “a bitmap image” or “JPEG image”. EX1030 at 16:53-57; Sur-reply at 19.

Hanggies' CDWM Window is Fully Interactive

There is no dispute that Hanggie's composite application window is interactive allowing the window to be modified as well as the content of the window:



As shown in Figure 3, [t]he frame or base content 303 of the window 301 may host child content including buttons 305 (e.g., used to **restore, maximize, minimize, close the window**, etc.), and indicative icon 307, **scrollbars** 309, **menu bar** 311, and **window caption text** 313.” EX1006 at [0058].

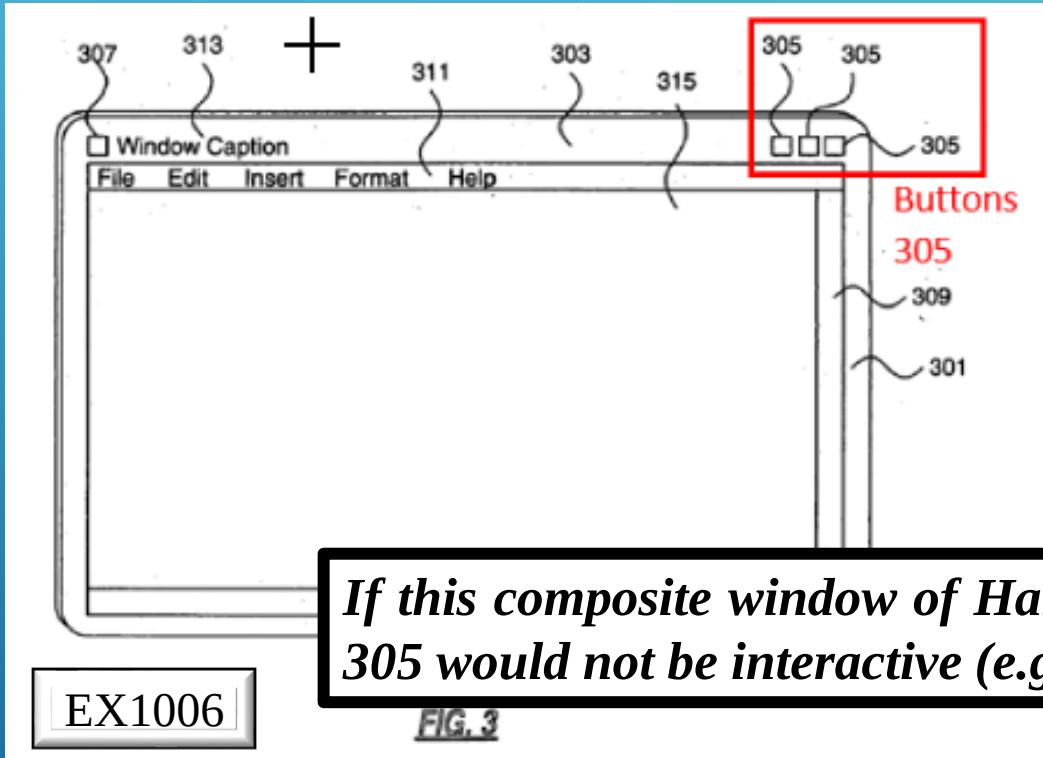
“The CDWM maps mouse hit-test points relative to application-defined, content-local, 3D coordinates, and delivers mouse event notifications to the application. ... Examples of system-managed content objects include the application indicative icon, frame buttons (e.g., minimize, restore, close), caption text, and certain menu bars. **Application-managed content objects include those content object(s) to which the application renders its primary visual output, e.g., text by a word processor, numeric grid by a spreadsheet application, or images by a photo editing application.**” EX1006 at [60].

Everyone Agrees That Hanggies' CDWM Window is Fully Interactive

- Dr. Fuchs also agreed that Hanggie's application window is interactive: "HAC teaches several methods through which a user can modify at least a portion of one of said first, second, and third application-specific data. For example, *Hanggie teaches that* each 'window may be comprised of a base content object (i.e., the frame) and a collection of one or more child content objects. Each *content object* may be defined by a unique set of content attributes, and *can be configured to optionally receive keyboard and mouse events*'....It was well known in the art that 'content objects(s) to which the application renders its primary visual output, *e.g., text by a word processor, numeric grid by a spreadsheet application, or images by a photo editing application*' *were modifiable by the user through the input devices, e.g., modifying text in a word processor application through a user selection of a key on a keyboard.*" EX1003 at ¶ [105] (quoting EX1006 at [60]).
- Dr. Schaefer explained that "a POSITA would have understood that *Hanggie does not generate images but displays active applications in 3D space*. In fact, this is why the window shown in Figure 3 of Hanggie can be "maximized," *i.e., because it is active. But it is not just the window that is active of Hanggie—so too is the content (e.g., application-specific data).*" EX2015 at [102]

HAC Does Not Teach or Suggest the Claimed Replacing Images

- Petitioner relies on the interactivity of Hanggie's composite application window to satisfy the "replacing" limitation. Pet. at 51-52; Reply at 8.



*“It would have been obvious to a POSITA that upon **“receiving a first interaction from [the] user of one of [the] plurality of images corresponding to one of said plurality of applications,”** e.g., through user selection of the maximize button for a window, HAC’s computer would have allowed the user to view the window in a “maximum” capacity such that it occupies all or almost all parts of the computer display.”* Pet. at 52.

If this composite window of Hanggie is truly an image, then control buttons 305 would not be interactive (e.g., to minimize or maximize the window).

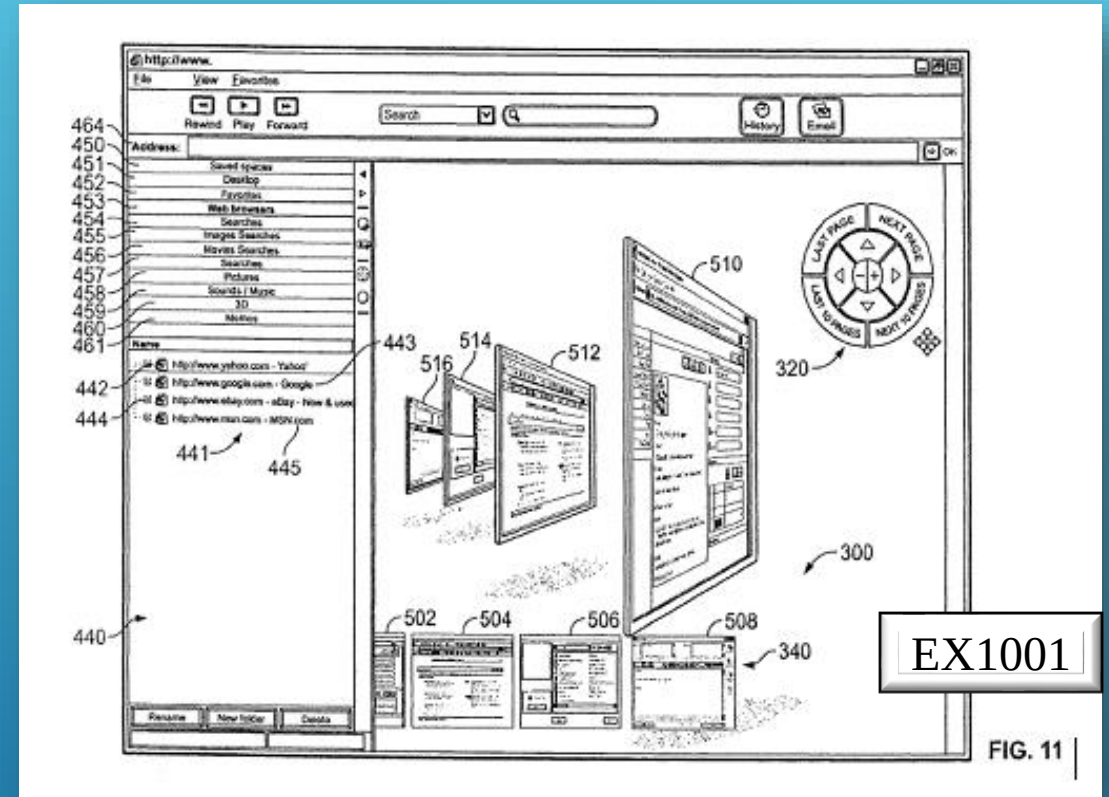
The Underlying Content is Both the Window (Object) and Content (Application-specific data)

A POSITA would have understood that a user cannot modify the imaged underlying application-specific data

Claims recite that an “image” is “an image” of the object and its application-specific data:

“generating a plurality of images, said plurality of images comprising at least first, second, and third images, wherein said *first image is an image of at least a portion of a first object generated by said first application and having first application-specific data*, said *second image is an image of at least a portion of a second object generated by said second application and having second application-specific data*, and said *third image is an image of at least a portion of a third object generated by said third application and having third application-specific data*”

EX1001, 37:61-38:4.

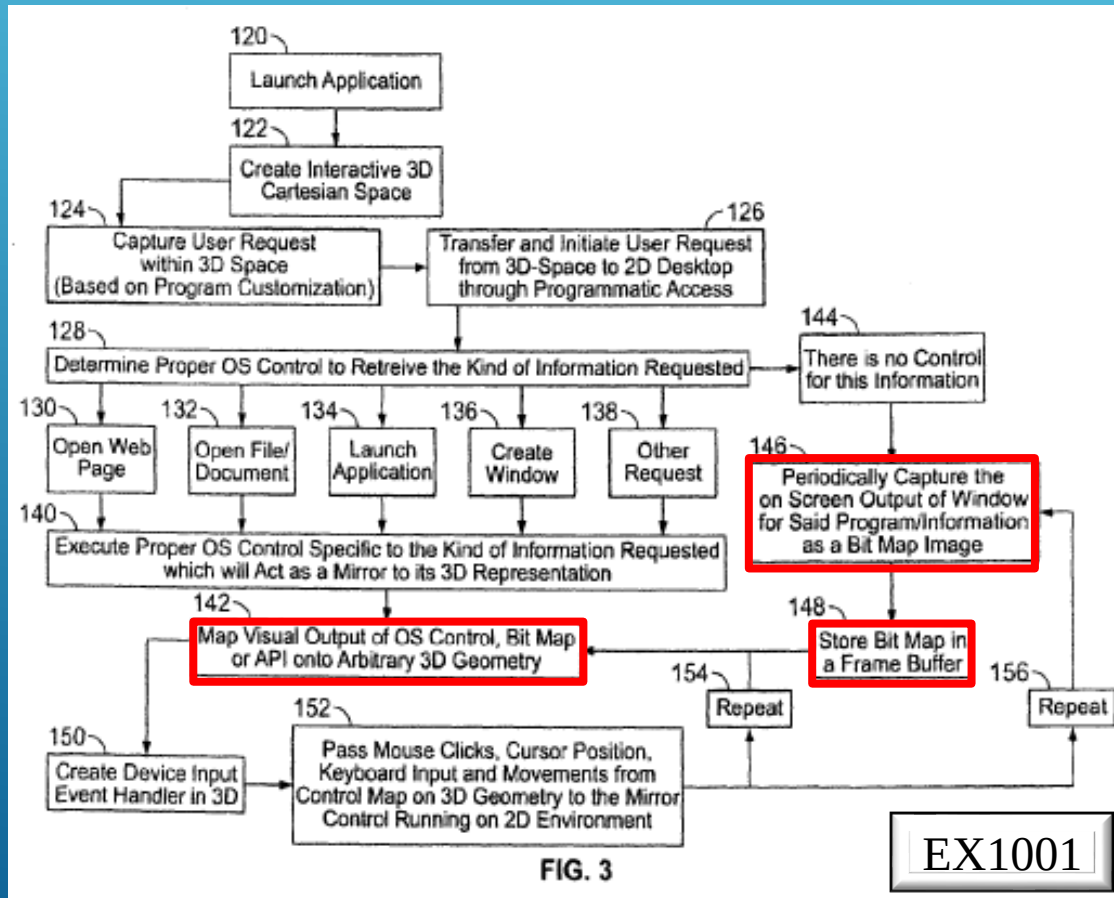


'654 Patent, Figure 11

Cannot Interact with Underlying Content That is Imaged

A POSITA would have understood that a user cannot modify the imaged underlying application-specific data

Specification discloses an image as a “Bit Map Image”

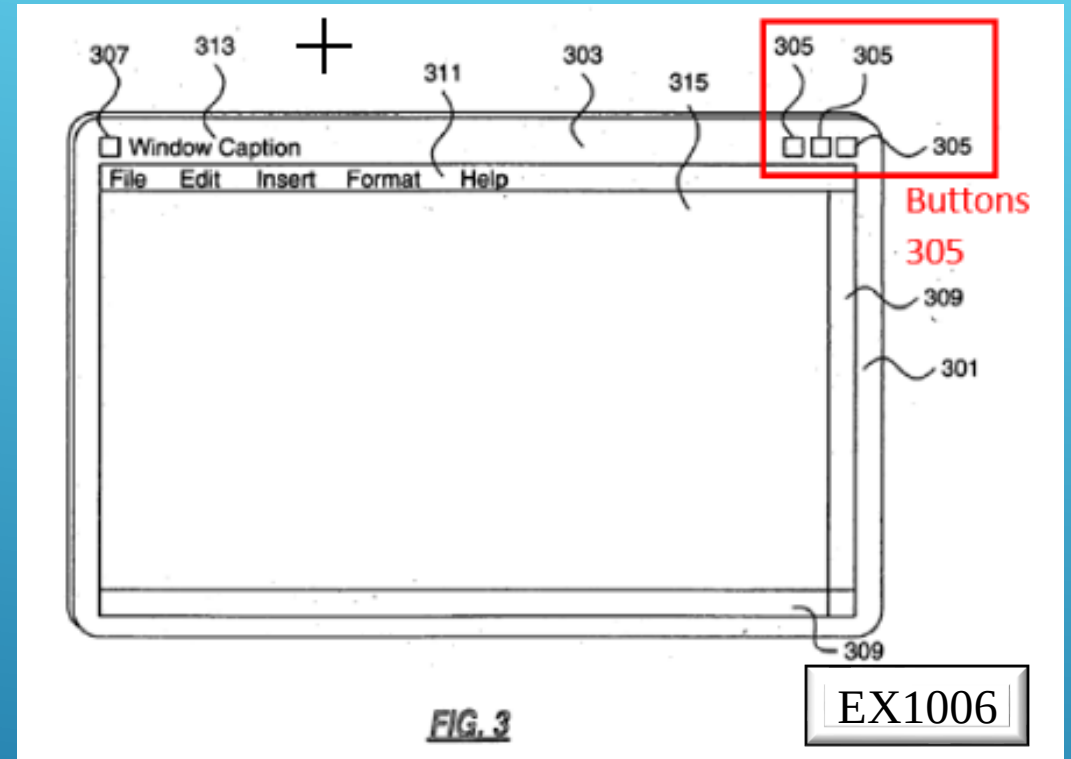


Dr. Schaefer explained that “A *POSITA* would have understood that if window in...proposed combination was an image as claimed, then the user would not be able to maximize the window, minimize the window, close the window, etc., through the control buttons on the window. This is why the claimed invention switches from an (inactive) image of the application in 3D space to an (active) application in 2D space to allow the user to interact with the object and modify the application-specific data.” EX2015 at [111].

HAC Does Not Teach or Suggest Replacing Images

Petitioner's Paradox

- If Hanggie's composite window is an image, you cannot interact with the underlying content (e.g., maximize button) as Petitioner proposes in the HAC.
- If a user can interact with the maximize button of Hanggie, then it is not the claimed image.

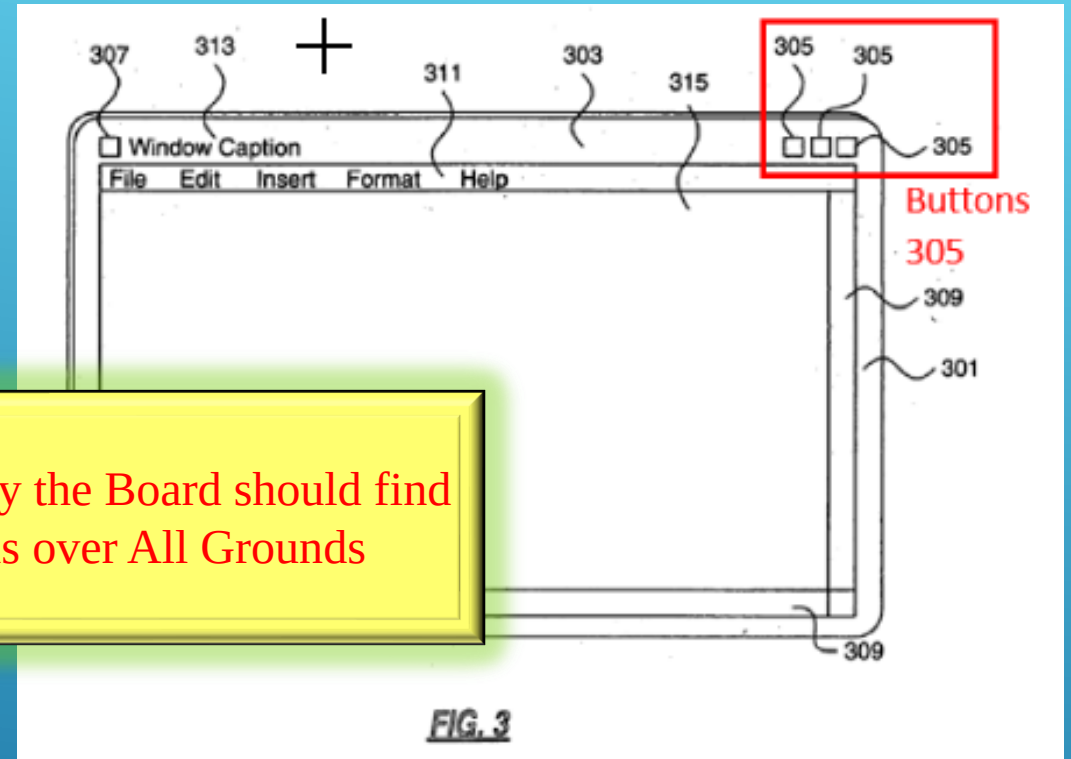


HAC Does Not Teach or Suggest Replacing Images

Petitioner's Paradox

- If Hanggie's composite window is an image, you cannot interact with the underlying content (e.g., maximize button) as Petitioner proposes in the HAC.
- If a user can interact with Hanggie, then it is not an image.

This is another independent reason why the Board should find the Challenged Claims not obvious over All Grounds



There Is No Motivation to Combine Anthony and Hanggie

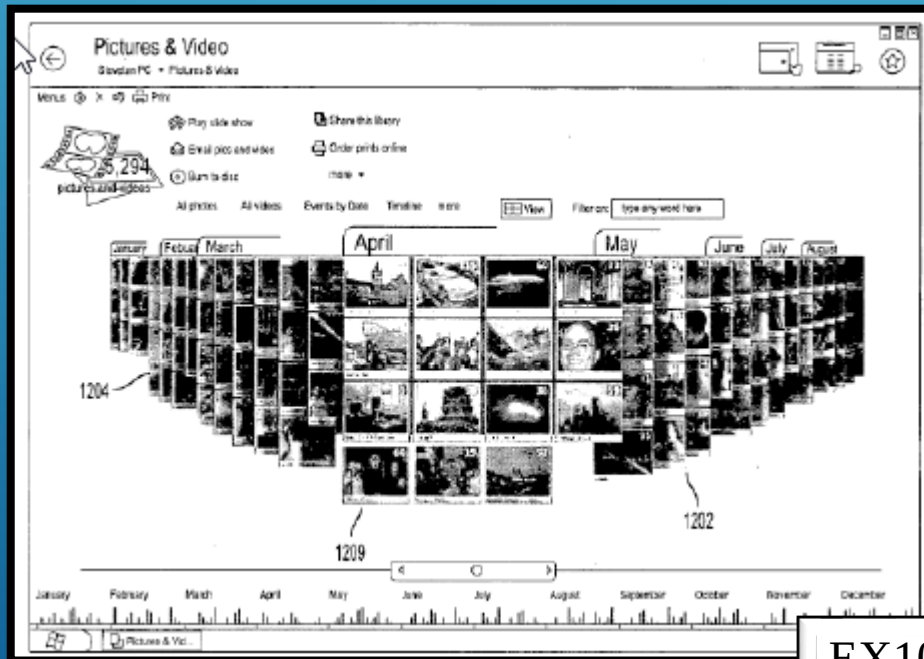
There is No Motivation to Combine Hanggie and Anthony as Proposed

Applies to all Grounds in the -343 and -344 IPRs: That is, Patent Owner's Arguments Regarding Anthony in view of Hanggie are the same as Hanggie in view of Anthony

There Is No Motivation to Combine Anthony and Hanggie

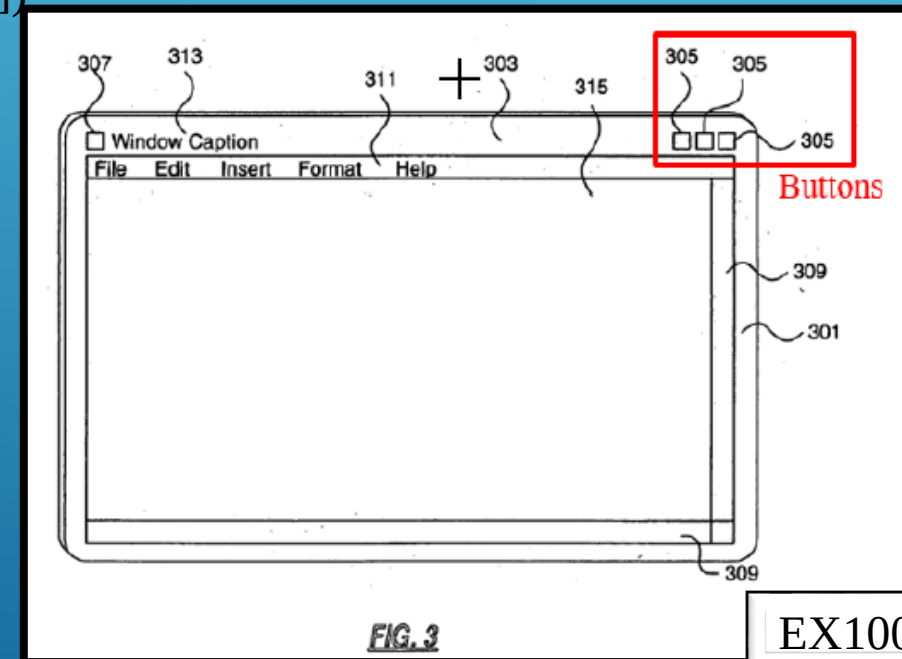
The GUIs of Hanggie and Anthony both are in 3D Space

“Anthony discloses ‘[a] *three-dimensional (3D) view* of a data collection based on an attribute.’”
Pet. at 11 (citing EX1007, Abstract).



EX1007

“Hanggie discloses a *compositing* DWM (CDWM) that “provide[s] a rich, full featured operating system ... to provide a desktop that uses advanced textures, lighting, and *3D transformations*, yet supports legacy applications.” Pet. at 16 (citing EX1006, ¶¶[0012], [0015], [0026])



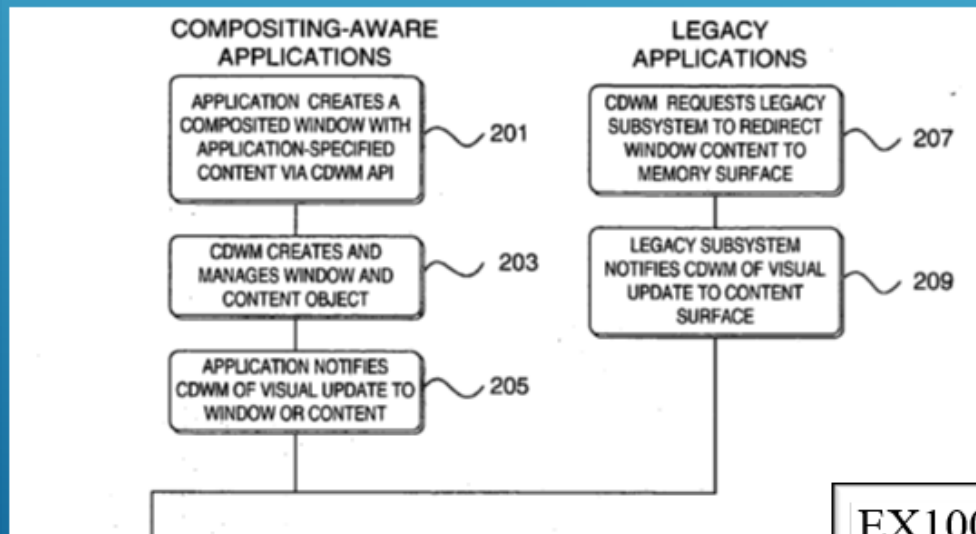
EX1006

There Is No Motivation to Combine Anthony and Hanggie

Hanggie's Legacy support does not mention 2D space

[0092] By providing legacy support, the operating system in which the CDWM and legacy DWM are integrated inherently has the capability to render the desktop using the invalidation DWM (legacy DWM 192a) or the compositing DWM (CDWM 190). That is, the invalidation model DWM is supported by the operating system in addition to the composition model in order to provide legacy support

EX1006

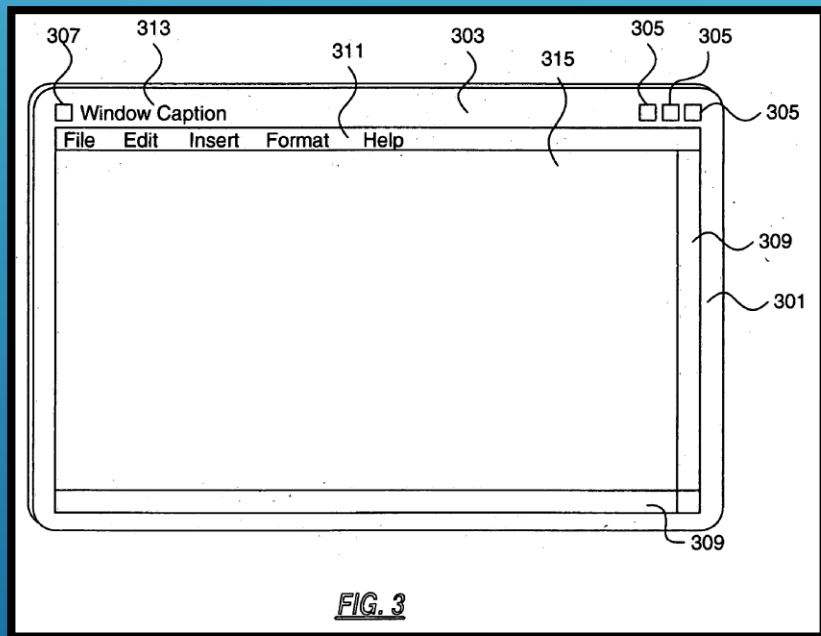


EX1006,
Fig. 2

- “**Legacy support** is provided so that the operating system can draw and render **windows generated by legacy applications to look consistent with non-legacy application windows.**” EX1006, Abstract.
- As such, using invalidation DWM for legacy applications **does not equate to a 2D space as Petitioner contends.**

There Is No Motivation to Combine Anthony and Hanggie

Even if Petitioner is correct, and switching from CDWM to legacy DWM results in a 2D space, such teachings are inapplicable to the claimed invention, which requires *images in 3D space*, and both parties agree that *a CDWM window is not an image – thus, switching from CDWM to legacy mode to conserve power does not provide any motivation regarding switching from images in 3D space.*



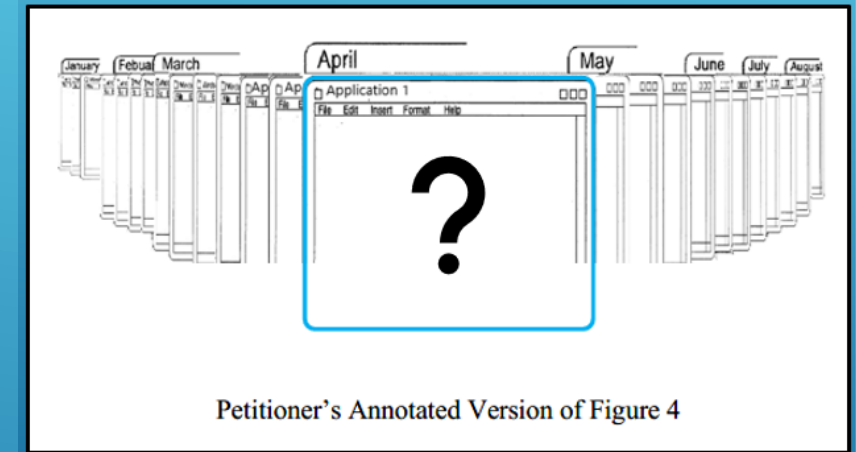
EX1006

- Dr. Fuchs testified that he “did not need to determine if this Figure 3 [of Hanggie] was an image according to ‘868 [Patent].” EX2019, 46:2-5.
- Dr. Schaefer testified that “a POSITA would have understood that Hanggie does not generate images but displays active applications in 3D space.” EX2015, [102].
- The Board recognized that Petitioner did not assert that Hanggie’s CDWM window was an image. Dec., 53 (“Petitioner, however, relies on Hanggie’s application window as teaching the recited ‘object,’ not the recited ‘plurality of images.’”).
- “Petitioner relies on the 3D windows in Anthony’s timeline as teaching the recited “plurality of images within said three-dimensional space.” Dec. at 53-54 (citing Pet. at 48–49).

There Is No Motivation to Combine Anthony and Hanggie

Petitioner cannot have it both ways. If an item in the foreground of Petitioner's proposed combination is a CDWM window, then it is not an image. If it is an image, then there is no motivation to employ switching from CDWM to legacy DWM.

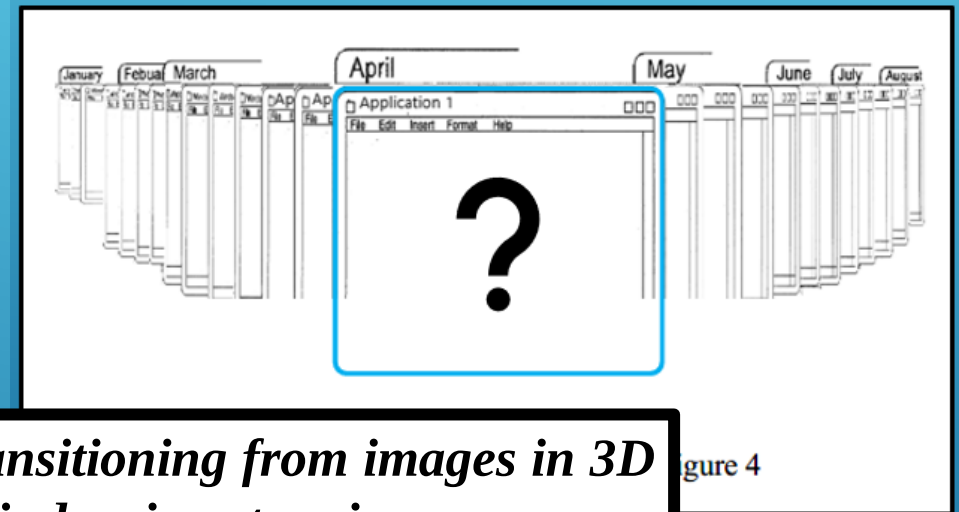
- As Dr. Schaefer explained, the claimed invention “provide[s] for a different solution to reduce power than Hanggie’s use of a 2D Legacy mode to display active applications, *i.e.*, display *images* of open application in 3D space.” EX2015, [117].
- “[A] POSITA would have understood that such motivation [to switch to Hanggie’s legacy mode] is not relevant to the claimed inventions ***because images are much easier to manipulate in 3D space than active applications; replacing the active applications with images would itself reduce power consumption, thereby eliminating the need to switch to 2D space.*** See e.g. EX2001 at [37 and 41].” EX2015 at [115]-[117]
- “Anthony’s “thumbnail” approach does not suffer from the intensive processing and memory requirements as Hanggie, and thus provides no motivation (or need) modify Anthony in light of Hanggie in order to switch from 3D to 2D space.” EX2015 at [118]



There Is No Motivation to Combine Anthony and Hanggie

Petitioner cannot have it both ways. If an item in the foreground of Petitioner's proposed combination is a CDWM window, then it is not an image. If it is an image, then there is no motivation to employ switching from CDWM to legacy DWM.

- Petitioner's response is "the purported advantage of manipulating images in 3D does not negate the advantages of more efficient system resource utilization *by transitioning from images in 3D space to an object in 2D space, as expressly disclosed by Hanggie.*" Reply, 21.



But Hanggie does not teach advantages "by transitioning from images in 3D space to an object in 2D space," as a CDWM window is not an image.

The "switching" disclosed in Hanggie is only to alleviate "the processor intensive calculations required for desktop compositing [CDWM]."

EX1006,
[0092]

There Is No Motivation to Combine Anthony and Hanggie

Petitioner's Paradox

- Petitioner argues that the motivation to switch from 3D space to 2D space is “expressly provided in Hanggie”—when switching from 3D space to 2D space “the video graphics processing unit (GPU) is less active and thus consumes less power.” ‘868 Reply, 17-18.
- Petitioner states that “Hanggie explains that selection of the legacy drawing mode (2D mode) can be based on power-conservation conditions, e.g., ‘when a portable device is disconnected from an AC power source and switches to battery power.’” *Id.*
- Petitioner further argues that “a user who may have earlier been mobile and subsequently found a power socket for the device to implement HAC’s system, would want to switch from 2D to 3D to enjoy 3D viewing because a power source is available. When the user decides to move again and can no longer remain connected to a power source, the user can transition back to 2D viewing.” ‘868 Reply, 27.
- However, for “replacing the plurality of images,” Petitioner argues that “Hanggie teaches that it can be beneficial to switch from 3D mode to a 2D mode to reduce graphic processing and thereby conserve battery power, and a POSITA would have recognized that those same advantages could be obtained by switching from a 3D to a 2D state upon user selection of a maximized control button.” ‘868 Pet., 26-27.

There Is No Motivation to Combine Anthony and Hanggie

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- Petitioner conservat power.” ***According to Petitioner, the only time that the proposed combination would operate in 3D space is when the device is plugged into an AC power source, as battery power is not an issue.***
- Petitioner device to available. transition ***Thus, there can be no motivation to “conserve battery power” (switch to 2D space) at this time (the only time the device is operating in 3D space) in response to selecting the maximized control button.***
- However, for “replacing the plurality of images,” Petitioner argues that “Hanggie teaches that it can be beneficial to switch from 3D mode to a 2D mode to reduce graphic processing and thereby conserve battery power, and a POSITA would have recognized that those same advantages could be obtained by switching from a 3D to a 2D state upon user selection of a maximized control button.” ‘868 Pet., 26-27.

HAC Does Not Teach or Suggest Claim 13 of the '868 Patent

The HAC Combination Does Not “Receive a Request From Said User to Switch From Said 2D Space to Said 3D Space” or Perform the “Replacing” Step in Response Thereto.

HAC Does Not Teach or Suggest Claim 13 of the '868 Patent

In the Institution Decision, the Board found that “Petitioner has not shown sufficiently that the combination of Anthony and Hanggie teaches or suggests this limitation in Claim 13.” Dec., 65-66.

- In response, Petitioner cites (again) to Hanggie (Paragraph 0092) and argues that the motivation to switch from 2D to 3D is “to enjoy 3D viewing [when] a power source is available.” Reply, 26-27.
- *First*, there is no motivation to apply Paragraph 0092 to the proposed combination as this paragraph deals with the “processor intensive calculations” required by using CDWM, not an image as claimed. EX1006, [0092]; *see also id.*, [0007], [0009].
- *Second*, Petitioner’s arguments essentially reads out the “switching” feature from Claim 13 and merely argues a motivation for the claimed “replacing” feature.

13. The system of claim 12, further comprising the step of receiving a request ~~from said user to switch from said 2D space to said 3D space~~, wherein said step of replacing said object in said 2D space with said plurality of images further comprises replacing said object in said 2D space with said plurality of images in response to receiving said request ~~to switch from said 2D space to said 3D space~~.

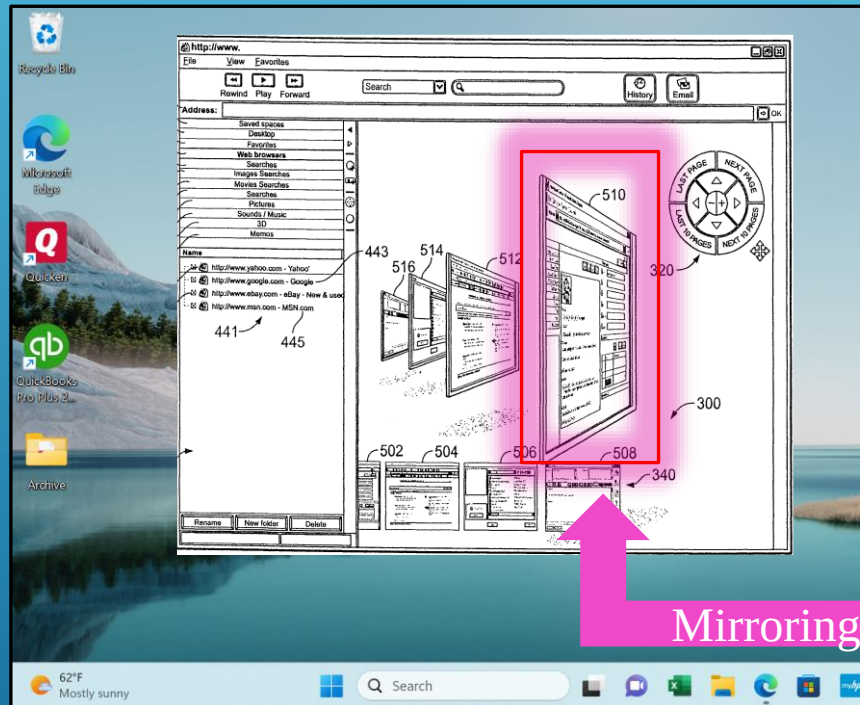
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- In response, Petitioner cites (again) to Hanggie (Paragraph 0092) and argues that the motivation to switch from 2D to 3D is “to enjoy 3D viewing [when] a power source is available.” Reply, 26-27.
- *First* deal EX1 According to Petitioner’s expert, Dr. Fuchs, this is because “the definition of ‘switch’ is irrelevant” and “not required” as “[Claim 13] doesn’t say that the switching actually has to take place.”
- *Second* deal EX2020, 58:4-14, 61:16-62:16. merely

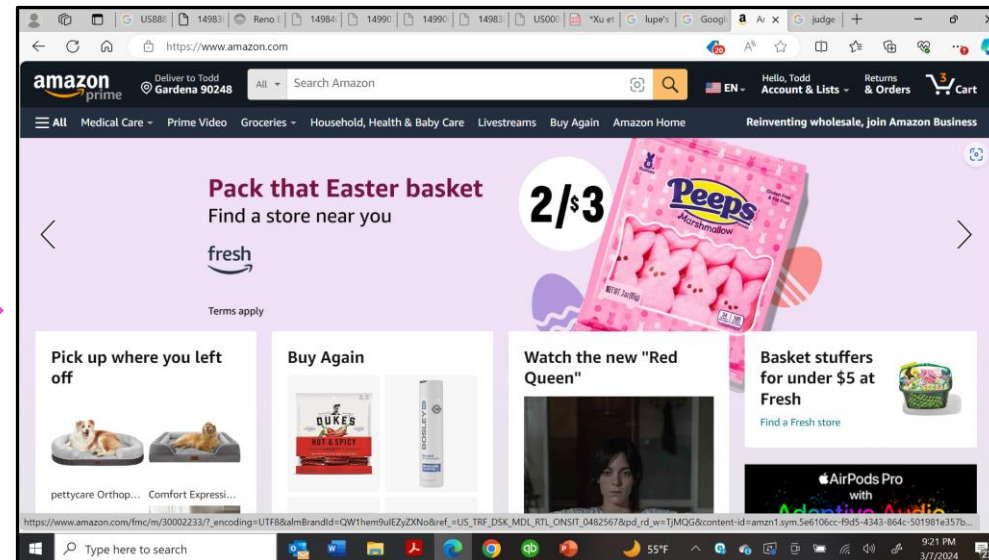
13. The system of claim 12, further comprising the step of receiving a request ~~from said user to switch from said 2D space to said 3D space~~, wherein said step of replacing said object in said 2D space with said plurality of images further comprises replacing said object in said 2D space with said plurality of images in response to receiving said request ~~to switch from said 2D space to said 3D space~~.

'868 Patent Switching Disclosure



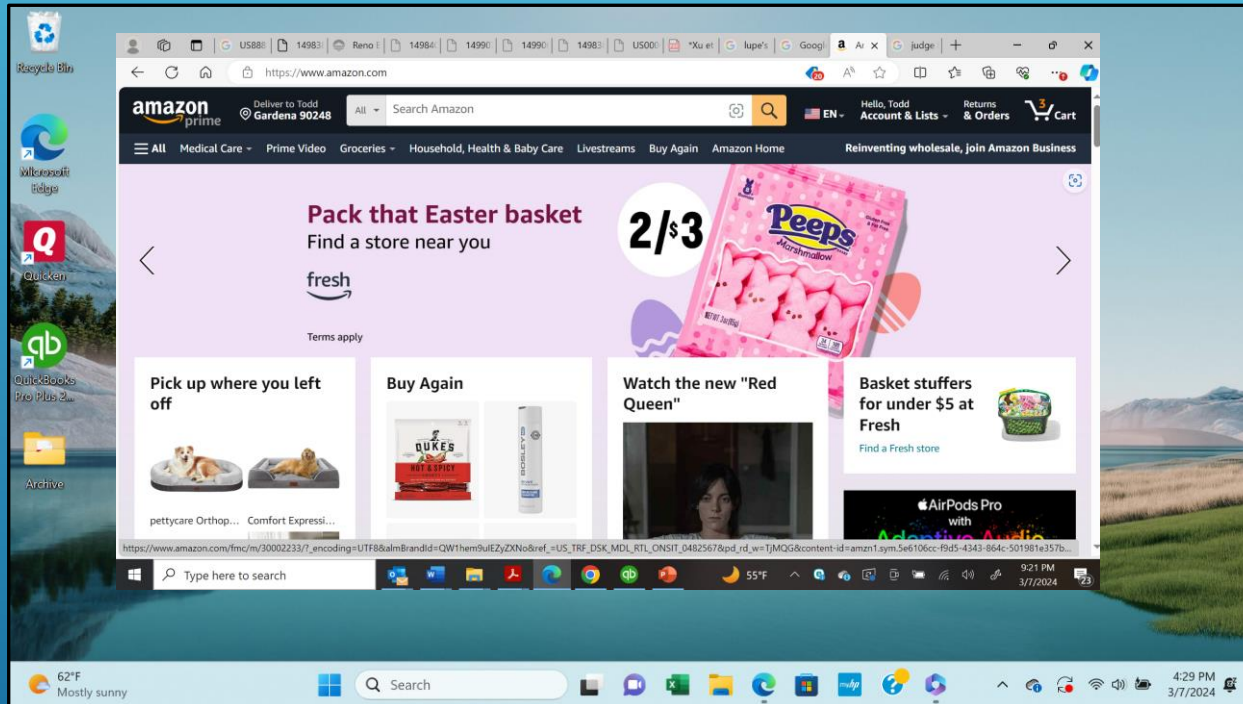
Mirroring

Hidden 2D Desktop



'868 Patent Switching Disclosure

'868 Switches From 2D to 3D Space, Thereby “Replacing Said Object in Said 2D Space With Said Plurality of Images [in 3D Space]”



- The '868 Patent provides “the end user has the freedom to *unbind to the hud or hide the 2D webpage* again that was initially or drawn off screen by clicking the appropriate button (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.” ‘868, EX1001, 22:20-30.

Hidden 2D Desktop



SPACETIME3D

EXHIBIT 2021 - PAGE 59

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Hanggie's Does Not Disclose “Switching” or “Replacing” in Response Thereto

- Petitioner ignores the “switching” component of Claim 13, as “no such requirement is present in the claims.” ‘868 Reply, 26.
- Petitioner argues that “[i]nstead claim 13 recites ‘replacing said object in said 2D space with said plurality of images.’” *Id.*, 26-27.
- Not true. In fact, the Board stated that “Claim 13 shows that Patentee knew how to restrict the claim to ‘switch from said 2D space to said 3D space.’” Dec., 52.
- The Board stated that “Petitioner does not explain how the combination of Anthony and Hanggie teaches or suggest” this feature. Petitioner responded by arguing that “switching” is not required, and as such “can be ignored.” EX2020, 58:4-14, 61:16-62:16.
- Petitioner references the “*legacy support*” in Hanggie for this feature and how “**CDWM may render the base portion of the application window 301 as a three-dimensional (3D) object.**” ‘868 Reply, 24-26.

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- Petitioner argues that “[i]nstead claim 13 recites ‘replacing said object in said 2D space with said plurality of images.’” *Id.*, 26-27.
- Not true. “**Legacy support** is provided so that the operating system can draw and render **windows generated by legacy applications to look consistent with non-legacy applications,**” *i.e.*, it alters the window, not the space. EX1006, Abstract.
- The Board teaches as such. Even if it did result in a 2D space (it does not), it would not result in “replacing said object in 2D space with said plurality of images” as claimed.
- Petitioner references the “**legacy support**” in Hanggie for this feature and how “**CDWM may render the base portion of the application window 301 as a three-dimensional (3D) object.**” ‘868 Reply, 24-26.

Finding of Not Obvious is Supported by Secondary Considerations

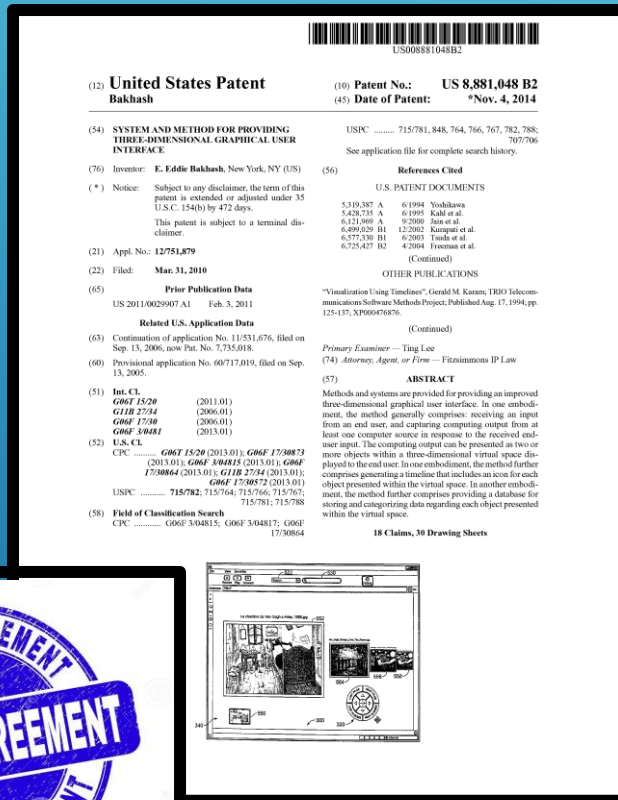
- *The '654 and '868 Patents are the subject of two licenses.*

- The licenses themselves have been submitted as evidence along with a declaration (EX2017) that provides details of the licenses, including:

- The Licenses are limited to '654 and '868 Patents and patents related thereto (at issue in the -00242 proceedings)

- The Licensees are two of the largest smartphone manufactures in the United States

- Amounts paid are substantially more than the cost of litigation.



Questions?