

# Patent Owner Stratasy, Inc.'s Presentation April 16, 2026

IPR2025-00311 — U.S. Patent No. 8,562,324

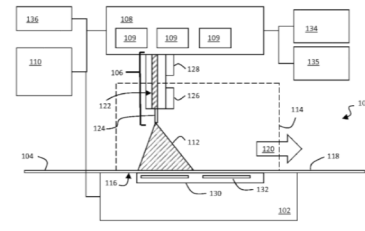
# Overview of Argument

## **I. Overview of the '324 Patent**

- II. The '324 Patent Requires Presentation of Camera Image and Projection at the Same Time
- III. Mori is not Analogous Art
- IV. Henke is not Analogous Art
- V. The Challenged Claims are Patentable Under Grounds 1A-1G
- VI. The Challenged Claims are Patentable Under Grounds 2A-2G

# Overview of the '324 Patent

- The '324 Patent "relates to three dimensional fabrication using networked resources."
- EX1001 at 1:14-15

|                                                                                                                                                                                        |  |                                                                                                                                                                                                                                                                                                                                                                                                                      |                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
|                                                                                                                                                                                        |  | <br>US008562324B2                                                                                                                                                                                                                                                                                                                 |                                   |
| (12) <b>United States Patent</b>                                                                                                                                                       |  | (10) <b>Patent No.:</b>                                                                                                                                                                                                                                                                                                                                                                                              | <b>US 8,562,324 B2</b>            |
| (45) <b>Pettis</b>                                                                                                                                                                     |  | (45) <b>Date of Patent:</b>                                                                                                                                                                                                                                                                                                                                                                                          | <b>Oct. 22, 2013</b>              |
| (54) <b>NETWORKED THREE-DIMENSIONAL PRINTING</b>                                                                                                                                       |  | 5,192,559 A                                                                                                                                                                                                                                                                                                                                                                                                          | 3/1993 Hull et al.                |
| (75) Inventor: <b>Nathaniel B. Pettis</b> , Brooklyn, NY (US)                                                                                                                          |  | 5,637,175 A                                                                                                                                                                                                                                                                                                                                                                                                          | 6/1997 Feygin et al.              |
| (73) Assignee: <b>MakerBot Industries, LLC</b> , Brooklyn, NY (US)                                                                                                                     |  | 5,730,817 A                                                                                                                                                                                                                                                                                                                                                                                                          | 3/1998 Feygin et al.              |
| (*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.                                                               |  | 5,738,817 A                                                                                                                                                                                                                                                                                                                                                                                                          | 4/1998 Danforth et al.            |
|                                                                                                                                                                                        |  | 6,129,872 A                                                                                                                                                                                                                                                                                                                                                                                                          | 10/2000 Jang                      |
|                                                                                                                                                                                        |  | 6,193,923 B1                                                                                                                                                                                                                                                                                                                                                                                                         | 2/2001 Leyden et al.              |
|                                                                                                                                                                                        |  | 6,195,205 B1                                                                                                                                                                                                                                                                                                                                                                                                         | 2/2001 Taira                      |
|                                                                                                                                                                                        |  | 6,490,496 B1                                                                                                                                                                                                                                                                                                                                                                                                         | 12/2002 Dacey                     |
|                                                                                                                                                                                        |  | 6,529,627 B1                                                                                                                                                                                                                                                                                                                                                                                                         | 3/2003 Callari et al.             |
|                                                                                                                                                                                        |  | 6,841,116 B2                                                                                                                                                                                                                                                                                                                                                                                                         | 1/2005 Schmidt                    |
|                                                                                                                                                                                        |  | 7,168,935 B1*                                                                                                                                                                                                                                                                                                                                                                                                        | 1/2007 Tamminger et al. 425/174.4 |
|                                                                                                                                                                                        |  | 7,958,236 B2                                                                                                                                                                                                                                                                                                                                                                                                         | 6/2011 Motoyama et al.            |
|                                                                                                                                                                                        |  | 8,282,380 B2                                                                                                                                                                                                                                                                                                                                                                                                         | 10/2012 Pax et al.                |
|                                                                                                                                                                                        |  | 8,286,236 B2                                                                                                                                                                                                                                                                                                                                                                                                         | 10/2012 Jung et al.               |
| (21) Appl. No.: <b>13/348,896</b>                                                                                                                                                      |  | (Continued)                                                                                                                                                                                                                                                                                                                                                                                                          |                                   |
| (22) Filed: <b>Jan. 12, 2012</b>                                                                                                                                                       |  | FOREIGN PATENT DOCUMENTS                                                                                                                                                                                                                                                                                                                                                                                             |                                   |
| (65) <b>Prior Publication Data</b>                                                                                                                                                     |  | WO                                                                                                                                                                                                                                                                                                                                                                                                                   | WO-201308309 6/2013               |
| US 2012/0105903 A1 May 3, 2012                                                                                                                                                         |  | OTHER PUBLICATIONS                                                                                                                                                                                                                                                                                                                                                                                                   |                                   |
| <b>Related U.S. Application Data</b>                                                                                                                                                   |  | Onagorwa, Seyi et al., "Fused Deposition of Ceramics (FDC) and Composites", School of Mechanical and Materials Engineering Washington State University Pullman, WA 99164-2920 amitsand@wsu.edu 2001, 224-231.                                                                                                                                                                                                        |                                   |
| (63) Continuation of application No. 13/314,337, filed on Dec. 8, 2011, which is a continuation-in-part of application No. 12/858,622, filed on Aug. 18, 2010, now Pat. No. 8,282,380. |  | (Continued)                                                                                                                                                                                                                                                                                                                                                                                                          |                                   |
| (51) <b>Int. Cl.</b>                                                                                                                                                                   |  | Primary Examiner — Joseph S Del Sole                                                                                                                                                                                                                                                                                                                                                                                 |                                   |
| <b>B29C 41/02</b> (2006.01)                                                                                                                                                            |  | Assistant Examiner — Nahida Sultana                                                                                                                                                                                                                                                                                                                                                                                  |                                   |
| <b>B29C 35/08</b> (2006.01)                                                                                                                                                            |  | (74) Attorney, Agent, or Firm — Strategic Patents, P.C.                                                                                                                                                                                                                                                                                                                                                              |                                   |
| (52) <b>U.S. Cl.</b>                                                                                                                                                                   |  | (57) <b>ABSTRACT</b>                                                                                                                                                                                                                                                                                                                                                                                                 |                                   |
| USPC ..... 425/150; 264/40.1; 264/308; 264/401; 700/98; 700/118; 425/375                                                                                                               |  | Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access to distributed content on one hand, and to manage use of distributed fabrication resources on the other. |                                   |
| (58) <b>Field of Classification Search</b>                                                                                                                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                      |                                   |
| USPC ..... 264/40.7; 401-405; 308; 425/174.4; 425/140; 375; 700/98; 118; 204                                                                                                           |  |                                                                                                                                                                                                                                                                                                                                                                                                                      |                                   |
| See application file for complete search history.                                                                                                                                      |  |                                                                                                                                                                                                                                                                                                                                                                                                                      |                                   |
| (56) <b>References Cited</b>                                                                                                                                                           |  |                                                                                                                                                                                                                                                                                                                                                                                                                      |                                   |
| U.S. PATENT DOCUMENTS                                                                                                                                                                  |  |                                                                                                                                                                                                                                                                                                                                                                                                                      |                                   |
| 4,097,566 A 6/1978 Bertin et al.                                                                                                                                                       |  |                                                                                                                                                                                                                                                                                                                                                                                                                      |                                   |
| 4,575,330 A 3/1986 Hull                                                                                                                                                                |  |                                                                                                                                                                                                                                                                                                                                                                                                                      |                                   |
|                                                                                                                                                                                        |  | <b>23 Claims, 6 Drawing Sheets</b>                                                                                                                                                                                                                                                                                                                                                                                   |                                   |
|                                                                                                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                      |                                   |

# Overview of the '324 Patent

- Petitioner challenges independent claims 1 and 19

| Claim Element | Language                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [1.pre]       | A device comprising:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| [1.a]         | a three-dimensional printer including a build volume;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| [1.b]         | a network interface coupled to a data network;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| [1.c]         | a video camera positioned to capture video of the build volume from a point of view; and                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| [1.d]         | a processor configured to receive a three-dimensional model through the network interface, and to control operation of the three-dimensional printer to fabricate the three-dimensional model as an object within the build volume of the three-dimensional printer, the processor further configured to provide a user interface to a remote user accessing the device through the network interface, and to present in the user interface an image of the build volume from the video camera and a two-dimensional projection of the three-dimensional model from the point of view of the video camera. |

| Claim Element | Language                                                                                                                                                                                                                                                                                           |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [19.pre]      | A method comprising:                                                                                                                                                                                                                                                                               |
| [19.a]        | providing a three-dimensional printer including a build volume, a network interface coupled to a data network, and a video camera positioned to capture video of the build volume from a point of view;                                                                                            |
| [19.b]        | receiving a three-dimensional model through the network interface;                                                                                                                                                                                                                                 |
| [19.c]        | fabricating the three-dimensional model as an object within the build volume of the three-dimensional printer; and                                                                                                                                                                                 |
| [19.d]        | providing a user interface to a remote user accessing the device through the network interface, wherein the user interface presents an image of the build volume from the video camera and a two-dimensional projection of the three-dimensional model from the point of view of the video camera. |

# Overview of the '324 Patent

- Petitioner also challenges claims 3-11 and 17-18, depending on claim 1, and claims 20-22, depending on claim 19.

**3.** The device of claim 1 wherein the two-dimensional projection is simulated based upon operation of the three-dimensional printer.

**4.** The device of claim 3 wherein the processor is configured to monitor operation of the three-dimensional printer based upon a comparison of the two-dimensional projection with the image of the build volume.

**5.** The device of claim 1 wherein the two-dimensional projection is dynamically updated to correspond to a state of physical completion of the object.

**6.** The device of claim 1 wherein the two-dimensional projection is a video image from the video camera.

**7.** The device of claim 1 wherein the user interface provides at least one control for manual operation of the three-dimensional printer by the remote user.

**8.** The device of claim 1 wherein the processor is configured to provide credential-based access to the user interface.

**9.** The device of claim 1 wherein the user interface provides status information for the three-dimensional printer.

**10.** The device of claim 1 wherein the user interface provides status information for a build process executing on the three-dimensional printer.

**11.** The device of claim 1 wherein the user interface displays a two-dimensional tool path for the three-dimensional printer, the two-dimensional tool path corresponding to a current layer of the object during a fabrication of the object by the three-dimensional printer.

**17.** The device of claim 1 wherein the user interface includes at least one control to capture a stop-motion animation of a fabrication of the object using the video camera.

**18.** The device of claim 1 wherein the processor is configured to couple the three-dimensional printer in a communicating relationship with a remote print server through the data network.

**20.** The method of claim 19 further comprising transmitting status information over the data network upon completion of the object.

**21.** The method of claim 20 wherein the status information includes data presented through the user interface.

**22.** The method of claim 20 wherein the status information includes a digital image from the video camera.

**23.** The method of claim 22 wherein the digital image is transmitted with an electronic mail communication confirming completion of the object.

# Overview of Argument

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- II. The '324 Patent Requires Presentation of Camera Image and Projection at the Same Time**
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# The '324 Patent Requires Presentation of Camera Image and Projection at the Same Time

Follows plain and ordinary meaning of the claims.

| <u>Claim Element</u> | <u>Language</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [1.pre]              | A device comprising:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| [1.a]                | a three-dimensional printer including a build volume;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| [1.b]                | a network interface coupled to a data network;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| [1.c]                | a video camera positioned to capture video of the build volume from a point of view; and                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| [1.d]                | a processor configured to receive a three-dimensional model through the network interface, and to control operation of the three-dimensional printer to fabricate the three-dimensional model as an object within the build volume of the three-dimensional printer, the processor further configured to provide a user interface to a remote user accessing the device through the network interface, and to present in the user interface an image of the build volume from the video camera and a two-dimensional projection of the three-dimensional model from the point of view of the video camera. |

| <u>Claim Element</u> | <u>Language</u>                                                                                                                                                                                                                                                                                    |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [19.pre]             | A method comprising:                                                                                                                                                                                                                                                                               |
| [19.a]               | providing a three-dimensional printer including a build volume, a network interface coupled to a data network, and a video camera positioned to capture video of the build volume from a point of view;                                                                                            |
| [19.b]               | receiving a three-dimensional model through the network interface;                                                                                                                                                                                                                                 |
| [19.c]               | fabricating the three-dimensional model as an object within the build volume of the three-dimensional printer; and                                                                                                                                                                                 |
| [19.d]               | providing a user interface to a remote user accessing the device through the network interface, wherein the user interface presents an image of the build volume from the video camera and a two-dimensional projection of the three-dimensional model from the point of view of the video camera. |

# The '324 Patent Requires Presentation of Camera Image and Projection at the Same Time

Follows plain and ordinary meaning of the claims.

## Claim 1

dimensional printer, the processor further configured to provide a user interface to a remote user accessing the device through the network interface, and to present in the user interface an image of the build volume from the video camera and a two-dimensional projection of the three-dimensional model from the point of view of the video camera.

## Claim 19

providing a user interface to a remote user accessing the device through the network interface, wherein the user interface presents an image of the build volume from the video camera and a two-dimensional projection of the three-dimensional model from the point of view of the video camera.

# The '324 Patent Requires Presentation of Camera Image and Projection at the Same Time

## Specification: remote-user management of three-dimensional printer

EX1001, Abstract

(57)

**ABSTRACT**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access to distributed content on one hand, and to manage use of distributed fabrication resources on the other.

EX1001, 1:36-38

home users. As these resources become more readily and widely available, a need has emerged for networking capabilities and network management for three-dimensional printers.

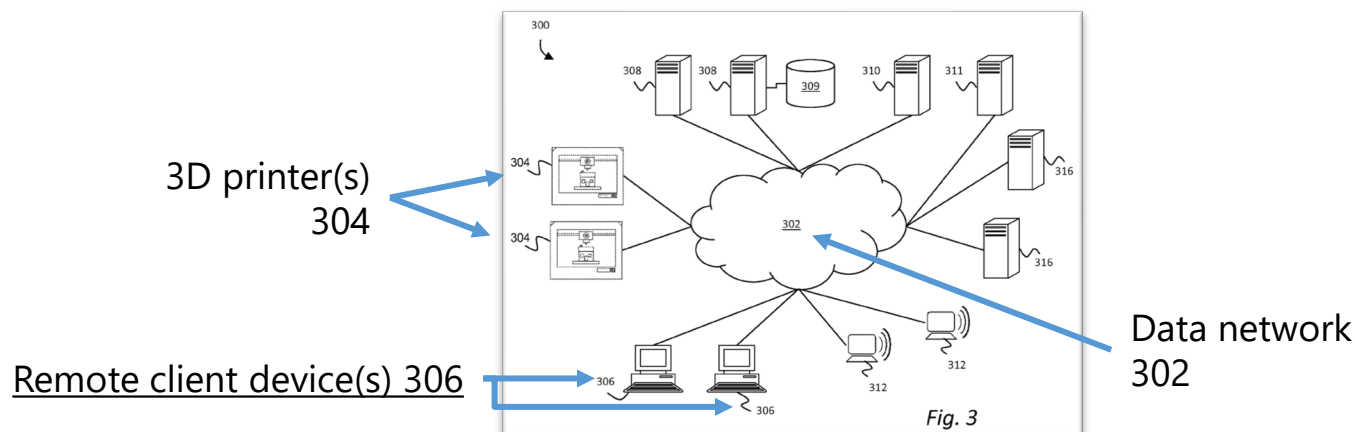
**SUMMARY**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access to distributed content on one hand, and to manage use of distributed fabrication resources on the other.

EX1001, 1:25-28

Client devices 306 may in general be devices within the environment 300 operated by users to initiate and monitor print jobs at the three-dimensional printers 304. This may include desktop computers, laptop computers, network computers, tablets, or any other computing device that can participate in the environment 300 as contemplated herein. Each

EX1001, 8:49-51



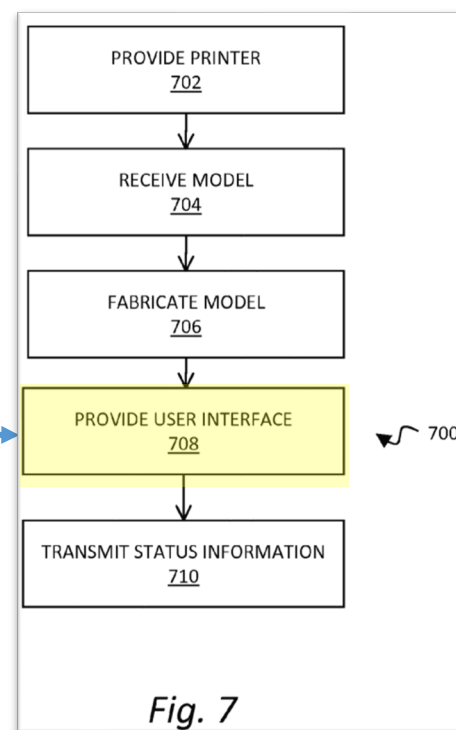
EX1001, Fig. 3

# The '324 Patent Requires Presentation of Camera Image and Projection at the Same Time

Specification: single step for providing user interface that presents image and projection

Single step (708) that "provide[s] a user interface" for "remote user" access to the printer in which "user interface presents an image of the build volume from the camera and a two-dimensional projection of the three-dimensional model from the point of view of the video camera."

EX1001, 24:47-52



EX1001, Fig. 7

# The '324 Patent Requires Presentation of Camera Image and Projection at the Same Time

Specification: purpose of user interface that presents both the actual image and projection at the same time is to compare “actual to expected” results.

EX1001, 25:35-49

The processor may be configured to monitor operation of the three-dimensional printer based upon a comparison of the two-dimensional projection with the image of the build volume. Using this type of image analysis, it may be possible to track actual progress against predicted progress to identify equipment malfunctions or other interference that might cause the physical object to deviate from the model used to fabricate the physical object. For example, a temperature change in an extruder, an air bubble in a path of melted supply material, or a tool misstep might cause an unrecoverable error in a fabrication process. By comparing actual to expected two-dimensional or three-dimensional results, a fabrication process can be expeditiously aborted and restarted or otherwise addressed without waiting for completion and physical inspection of the constructed object. In addition, more subtle

Enables addressing fabrication process “without waiting for completion and physical inspection of the constructed object”

# The '324 Patent Requires Display of Camera Image and Projection at the Same Time

Prosecution History confirms the plain meaning:

“nothing” in the prior art “specifically leads” to the “claimed user interface, which provides both video and model views from the same point of view in order to permit *side-by-side comparison* of model and results by a remote user.”

May 22, 2013 Amendment and Reply to Office Action (EX1002 at 161).

As most generously construed, *Taminger* thus suggests remote control and monitoring of a three-dimensional fabrication process; however, there is nothing in this general suggestion that specifically leads to the applicant's claimed user interface, which provides both video and model views from the same point of view in order to permit side-by-side comparison of model and results by a remote user. *Taminger* cannot anticipate the invention of claim 1 because *Taminger* does not teach a processor configured to provide a user interface [to a remote user] that includes an image of a build volume from a video camera *and* a two-dimensional projection of a three-dimensional model from the point of view of the video camera.

# The '324 Patent Requires Presentation of Camera Image and Projection at the Same Time

Applicant's printer includes **a processor configured to present both the image and projection from the same point of view.**

The applicant has devised a personal manufacturing device, e.g., a three-dimensional printer, configured for use as a remote network resource. In addition to receiving a model through a network interface and controlling the printer to fabricate a model, a processor provides a user interface that shows both a video of an object being manufactured and a three-dimensional model of the object. Further, in order for a remote user to monitor progress of fabrication in a meaningful way, the three-dimensional model is rendered in the user interface from the perspective of the video camera that provides the image, thus advantageously permitting side-by-side comparison by a remote user of the model and the resulting object. This feature is expressly claimed as a processor configured to “present in the user interface an image of the build volume from the camera and a two-dimensional projection of the three-dimensional model from the point of view of the video camera.”

Meaningful monitoring: user interface presents both the model and resulting object to permit side-by-side comparison

May 22, 2013 Amendment and Reply to Office Action (EX1002 at 160).

# The '324 Patent Requires Presentation of Camera Image and Projection at the Same Time

## **Examiner agreed with the applicant:**

Prior art (Taminger) does not teach presenting the user interface with both the image and projection from the same point of view

Aug. 5, 2013 Notice of Allowance (EX1002 at 174)

1. **Claims 1-23 are** allowed.
2. The following is an examiner's statement of reasons for allowance: the applicant argued that the closest prior art reference by Taminger (US 7,168,935) teaches all the limitation **except having a device comprising: presenting the user interface an image of the build volume from the video camera and a two-dimensional projection of the three-dimensional model from the point of view of the video camera** (see applicant's argument on page 7, lines 7 – 25).

# The '324 Patent Requires Presentation of Camera Image and Projection at the Same Time

- The patentee would have described a sequential operation for the presentation of the image and projection had it wanted to do so.
  - Obtaining status information which may be “subsequently presented” to a user

sional printers 304 in order to obtain status information concerning, e.g., availability of printers and/or the status of particular print jobs, any of which may be subsequently presented to a user through the web server. A print server 308

EX1001, 9:17-22

- Enabling multiple, “sequential object prints” without human supervision

cant manufacturing time to fabricate an object. At the same time, certain printers may include a tool or system to enable multiple, sequential object prints without human supervision or intervention, such as the conveyor belt described above. In

EX1001, 15:19-22

- Limiting the number of objects made from a source to give “subsequent priority” to content from other sources

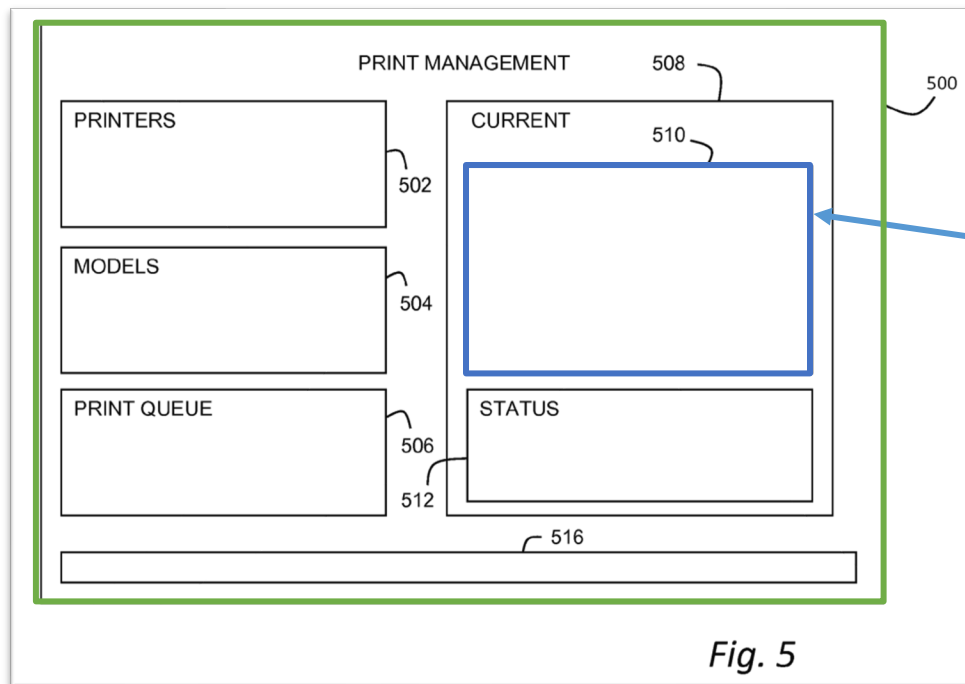
example, a user may limit the number of objects fabricated from a particular source, giving subsequent priority to content from other sources regardless of an objectively determined priority for a new object from the particular source. This

EX1001, 15:59-63

# The '324 Patent Requires Presentation of Camera Image and Projection at the Same Time

## Nothing suggests sequential presentation of the image and projection

Specification: displaying image “also or instead” of a visual representation



EX1001, Fig. 5

User interface 500 for user to “visually monitor progress or status of a remote print job”

EX1001, 22:56-57

Visualization area 510 displays a visual representation of the print job, such as “a current tool path of the printer that is executing the print job,” “also or instead [] a simulated print object,” and “also or instead [] an image of a working volume.”

EX1001, 22:50-55

# The '324 Patent Requires Presentation of Camera Image and Projection at the Same Time

- Petitioner's argument that user interface can be "dynamically updated with new information" is simply another example. *See* Reply, 2-3

For example, the visualization area **510** may display a current tool path of the printer that is executing the print job, such as a two-dimensional layer of the object showing a path of a print head as it traverses that layer. The visualization area **510** may also or instead show a simulated print object, such as a rendering of a three-dimensional model depicting a current state of the completion of an object being fabricated according to a print job. The visualization area **510** may also or instead show an image of a working volume of a three-dimensional printer or other fabrication resource captured during execution of the print job. This may, for example, include a digital still image

EX1001, 22:43-53

As shown in step **708**, the method **700** may include providing a user interface to a remote user accessing the device through the network interface, wherein the user interface presents an image of the build volume from the camera and a two-dimensional projection of the three-dimensional model from the point of view of the video camera. This may be any of the user interfaces described above, or any other suitable interface for conveying visual information such as a video image and/or model projection. It will be understood that a

EX1001, 24:47-55

As shown in step **710**, the method **700** may include transmitting status information over the data network upon completion of the object. This may, for example, include data presented through the user interface, or any other status information or summary thereof. For example, the status informa-

EX1001, 25:6-10

**20.** The method of claim **19** further comprising transmitting status information over the data network upon completion of the object.

**21.** The method of claim **20** wherein the status information includes data presented through the user interface.

EX1001, cls. 20-21

# Overview of Argument

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# Mori is not Analogous Art

- Petitioner must establish a reference is analogous art for it to be treated as prior art for obviousness

U.S.C. § 103. Although § 103 does not, by its terms, define the “art to which [the] subject matter [sought to be patented] pertains,” this determination is frequently couched in terms of whether the art is analogous or not, *i.e.*, whether the art is “too remote to be treated as prior art.” *In re Sovish*, 769 F.2d 738, 741, 226 USPQ 771, 773 (Fed.Cir.1985).

*In re Clay*, 966 F.2d. 656, 658 (Fed. Cir. 1992)

- The Petition asserts that Mori is in the same field as the '324 Patent

398, 417 (2007). Here, the systems of Mazumder and Mori are each directed to “three-dimensional fabrication” systems, which is the same field identified in the '324 patent. EX1001, 1:14-20. Mazumder discloses that similar computer-aided

# Mori is not Analogous Art

- Petitioner asserts Mori is in the same field as the '324 Patent: the three-dimensional fabrication industry
- BUT, the field of endeavor inquiry is not satisfied simply because the references relate to the same industry

The PTO argues that Sydansk and Clay's inventions are part of a common endeavor—"maximizing withdrawal of petroleum stored in petroleum reservoirs." However, Sydansk cannot be considered to be within Clay's field of endeavor merely because both relate to the petroleum industry. Sy-

\* \* \*

Clay's field of endeavor is the *storage* of refined liquid hydrocarbons. The field of endeavor of Sydansk's invention, on the other hand, is the *extraction* of crude petroleum. The Board clearly erred in considering Sydansk to be within the same field of endeavor as Clay's.

Clay: *storage* of refined liquid hydrocarbons

Sydansk: *extraction* of crude petroleum

*In re Clay*, 966 F.2d 656, 659 (Fed. Cir. 1992).

# Mori is not Analogous Art

- Analysis of the same field of endeavor considers explanations of invention's subject matter:
  - Embodiments
  - Function
  - Structure

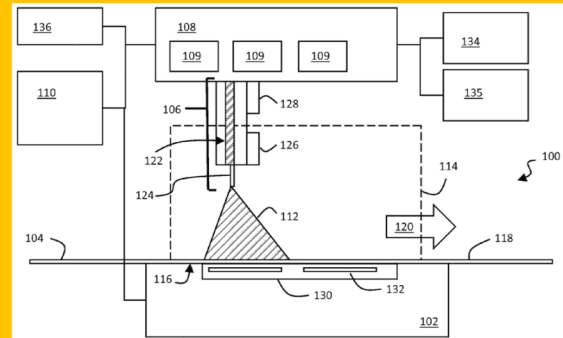
in the field of his endeavor.” *Wood*, 599 F.2d at 1036. To determine the applicable field of endeavor, the factfinder must consider “explanations of the invention’s subject matter in the patent application, including the embodiments, function, and structure of the claimed invention.” *Bigio*, 381 F.3d at 1325 (first citing *Wood*, 599 F.2d at 1036; then citing *Deminski*, 796 F.2d at 442). In *Wood*, for example,

Airbus S.A.S. v. Firepass Corp., 941 F.3d 1374,  
1380-81 (Fed. Cir. 2019)

# Mori is not Analogous Art

- Mori has a different structure from the '324 Patent

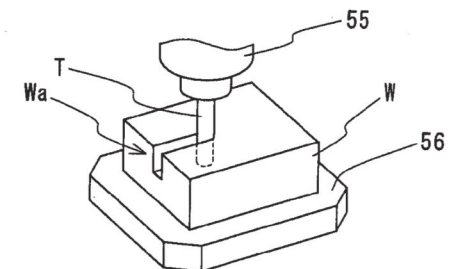
- The hardware in the '324 Patent is **a three-dimensional printer or additive fabrication device**.
  - EX1001, Fig. 1, 1:34-35, 1:41-61, 1:65-2:5, 2:17-18, Title, Abstract, cls. 1, 19, Figs. 3-7



EX1001, Fig. 1

Fig. 1

- Mori's hardware is **a destructive machining tool that destructively cuts into a workpiece**.
  - EX1005, Fig. 10, ¶¶[0069], [0085], Title, Abstract; EX2009, ¶111



EX1005, Fig. 10

# Mori is not Analogous Art

- The hardware in the '324 Patent is a three-dimensional printer or an additive fabrication device

## NETWORKED THREE-DIMENSIONAL PRINTING

EX1001, Title

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can pro-

EX1001, Abstract

and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can pro-

EX1001, 1:34-35

# Mori is not Analogous Art

- The hardware in the '324 Patent is a three-dimensional printer or an additive fabrication device

What is claimed is:

1. A device comprising:  
a three-dimensional printer including a build volume;

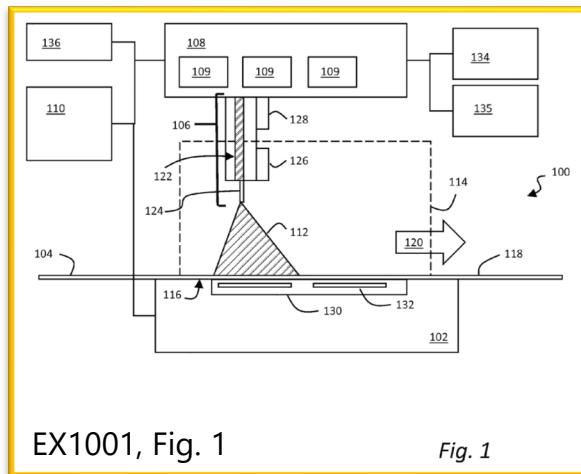


FIG. 1 is a block diagram of a three-dimensional printer. In general, the printer 100 may include a build platform 102, a

19. A method comprising:  
providing a three-dimensional printer including a build

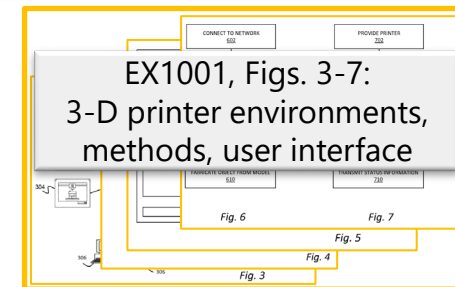


FIG. 3 depicts a networked three-dimensional printing environment.

FIG. 4 is a flowchart of a method for using a three-dimensional printer, such as any of the three-dimensional printers described above, when coupled to a data network.

FIG. 5 depicts a user interface for management of networked printing.

FIG. 6 is a flowchart of a method for operating a three-dimensional printer coupled to a network.

FIG. 7 is a flowchart of a method for operating a three-dimensional printer coupled to a network. EX1001, 1:51-61

EX1001, 2:17-18

# Mori is not Analogous Art

- The hardware in the '324 Patent is a three-dimensional printer or an additive fabrication device
  - Additive manufacturing is the sole focus of the '324 Patent, not just “one example” of a 3-D process to which it is directed

EX1001, 1:65-2:13

Described herein are devices and methods for using networked three-dimensional printers. It will be understood that while the exemplary embodiments below emphasize fabrication techniques using extrusion, the principles of the invention may be adapted to a wide variety of three-dimensional fabrication processes, and in particular additive fabrication processes including without limitation selective laser sintering, fused deposition modeling, three-dimensional printing, and the like. All such variations that can be adapted to use with a networked fabrication resource as described herein are intended to fall within the scope of this disclosure. It should also be understood that any reference herein to a fabrication process such as printing or three-dimensional printing is intended to refer to any and all such additive fabrication process unless a different meaning is explicitly stated or otherwise clear from the context. Thus by way of example and

# Mori is not Analogous Art

- Mori's hardware is **a destructive machining tool (T) that destructively cuts into a workpiece (W)**

**MACHINING STATUS MONITORING  
METHOD AND MACHINING STATUS  
MONITORING APPARATUS**

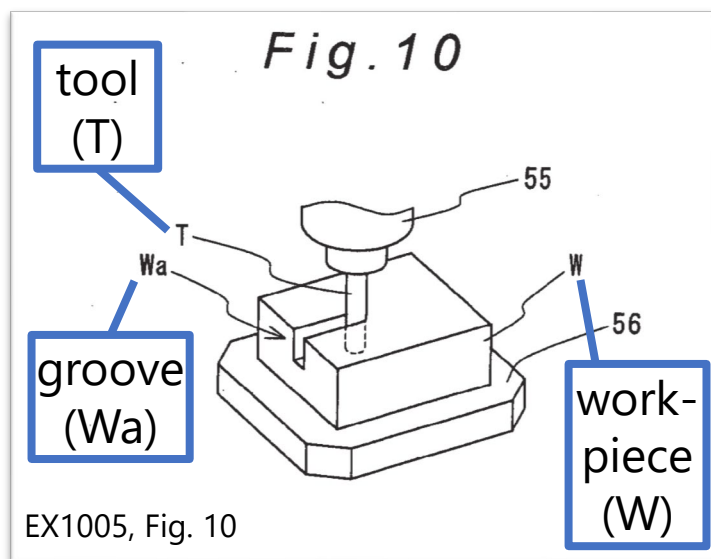
EX1005, Title

A **machining** status monitoring apparatus is provided on a **machine tool**, and has a plurality of actual CCD cameras for imaging the **tool and workpiece** from different view points and generating actual two-dimensional image data thereof, a

EX1005, Abstract

# Mori is not Analogous Art

- Mori's hardware is a **destructive machining tool (T) that destructively cuts into a workpiece (W)**



*Id.* at Fig. 10, [0069]. When the tool (T) is hidden from view, such as when it is cutting into the workpiece (W), Mori teaches displaying sectional images. *See id.*; *see also* [0085]. And when coolant is being supplied, Mori teaches displaying virtual

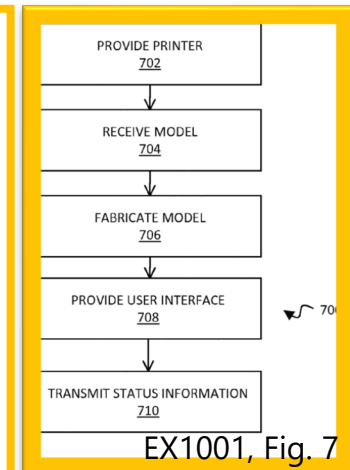
EX2009, ¶111

[0069] On the other hand, in step S32, when determining that the distal end of the tool T is hidden in all of the virtual images, the camera selection section 24 transmits a sectional image generation signal to the sectional image generating section 26, and simultaneously transmits a sectional image display signal to the display-image switching section 25 (step S37). As an example of the case to which this is applied, the case where a groove Wa is formed on the workpiece W by machining as shown in FIG. 10 is provided.

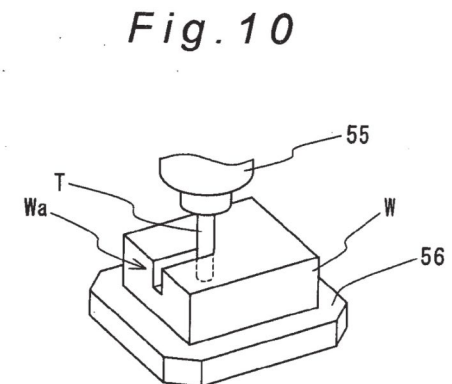
EX1005, ¶[0069]

# Mori is not Analogous Art

- Mori has a different function from the '324 Patent
- Function in the '324 Patent is **providing a user interface to a remote user that presents an image of the build volume of the three-dimensional printer within which the three-dimensional model is being fabricated as an object and a two-dimensional projection of the three-dimensional model that is from the same point of view as the image.** EX1001, Fig. 7, 24:43-52; EX2009, ¶112



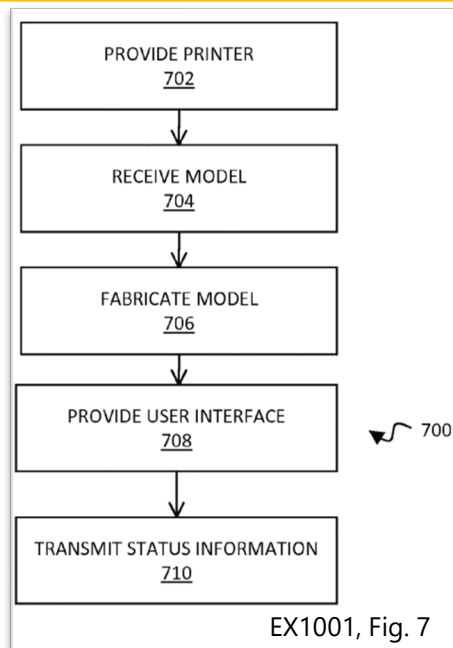
- Mori's function is **machining status monitoring for a destructive machining tool that is hidden from view.**
  - EX1005, ¶¶[0004], [0021]-[0022], [0024]-[0025], [0085], Fig. 10; EX2009, ¶¶1111-12



EX1005, Fig. 10

# Mori is not Analogous Art

- The function performed by the hardware in the '324 Patent is: providing a user interface to a remote user that presents an image of the build volume of the three-dimensional printer within which the three-dimensional model is being fabricated as an object and a two-dimensional projection of the three-dimensional model that is from the same point of view as the image



As shown in step **706**, the method **700** may include fabricating the three-dimensional model as an object within the build volume of the three-dimensional printer, all as generally contemplated above.

As shown in step **708**, the method **700** may include providing a user interface to a remote user accessing the device through the network interface, wherein the user interface presents an image of the build volume from the camera and a two-dimensional projection of the three-dimensional model from the point of view of the video camera. This may be any

EX1001, 24:43-52

# Mori is not Analogous Art

- Dr. Cormier reviewed the '324 Patent and concluded that nothing teaches a concern with a 3-D printer or additive manufacturing device having an object additively fabricated that is hidden from view during fabrication.

(Summary of the '324 Patent); *see also* EX1001, 24:43-25:5, Fig. 7. A POSITA would have understood that the '324 Patent does not teach a concern with the three-dimensional printer or object being additively fabricated by the three-dimensional printer being hidden from view during fabrication. Thus, Mori is not in the same

EX2009, ¶1112

# Mori is not Analogous Art

- The function performed by Mori's hardware is: machining status monitoring for a destructive machining tool that is hidden from view.

111. Mori teaches a destructive machining tool with a machining status monitoring status apparatus and method. *Supra* Section VI.B (Overview of Mori). Mori's machining tool (50 in Figure 2) includes a tool (T) and workpiece (W). *See* EX1005, at Fig. 2. As I explained above, Mori has two different disclosures of its machining status monitoring apparatus and method. *Supra* Section VI.B (Overview of Mori). Both of these disclosures consider issues specific to destructive manufacturing tools, including whether the tool is hidden as it cuts into the workpiece and whether coolant is being supplied to cool the contact area between the tool and workpiece. *See* EX1005, Abstract, [0004]-[0029] (describing first apparatus/method), Fig. 9, [0071-0073], [0087] (describing the second apparatus/method). As shown below in Figure 10 of Mori, the tool (T) can cut a groove (Wa) into workpiece (W).

EX2009, ¶111

# Mori is not Analogous Art

- The function performed by Mori's hardware is: machining status monitoring for a destructive machining tool that is hidden from view.

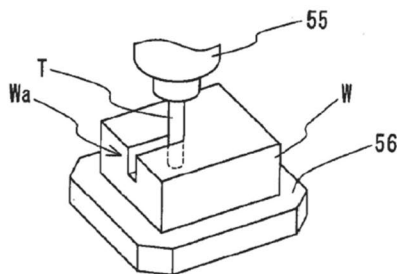
[0004] However, even if a camera is arranged as described above, it is possible that only images in which the tool is hidden by the workpiece are obtained due to the position relationship between the tool and the workpiece. Therefore, there is a case where the machining status of a workpiece cannot be monitored sufficiently.

EX1005, ¶[0004]

# Mori is not Analogous Art

- The function performed by Mori's hardware is: machining status monitoring for a destructive machining tool that is hidden from view.

Fig. 10



*Id.* at Fig. 10, [0069]. When the tool (T) is hidden from view, such as when it is cutting into the workpiece (W), Mori teaches displaying sectional images. *See id.*; *see also* [0085]. And when coolant is being supplied, Mori teaches displaying virtual images in the second apparatus/method. *See id.* at Fig. 9, [0071]-[0073]. Otherwise, Mori teaches displaying actual images. *See id.*; *see also* Abstract, [0022]-[0029]. Thus, Mori is in the field of destructive machining tools and switching display based on whether the tool is visible during machining.

EX2009, ¶1111

## Mori is not Analogous Art

- Petitioner improperly introduces a new theory in its Reply that Mori is reasonably pertinent to the '324 Patent. See Reply, 8.

Mori is also reasonably pertinent to the problem addressed by the '324 Patent of monitoring an automated process. EX1001, 8:49-51, 12:47-51, 14:63-

# Mori is not Analogous Art

- **An “IPR petitioner is the ‘master of its own petition.’”**

- *Qualcomm Inc. v. Apple Inc.*, 134 F.4<sup>th</sup> 1355, 1367 (2025)

In this instance, we agree with Qualcomm that Apple should be held to the phrasing of its petition because an IPR petitioner is the “master of its own petition.” *Intuitive Surgical, Inc. v. Ethicon LLC*, 25 F.4<sup>th</sup> 1035, 1041 (Fed. Cir. 2022); see Appellant’s Br. 34. Apple responds

- *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1357 (2018)

In all these ways, the statute tells us that the petitioner’s contentions, not the Director’s discretion, define the scope of the litigation all the way from institution through to conclusion.

# Mori is not Analogous Art

- **Petitioner is not permitted to introduce new approaches or theories in a reply**

Generally, a reply or sur-reply may only respond to arguments raised in the preceding brief. 37 C.F.R. § 42.23, except as noted above. “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.

Consolidated Trial Practice Guide  
(84 Fed. Reg. 64,280 (Nov. 21, 2019)) at 74

# Mori is not Analogous Art

- **The Petition's Theory is clear:  
Mori is directed to “three-dimensional fabrication” systems  
in the same field as the '324 Patent**

398, 417 (2007). Here, the systems of Mazumder and Mori are each directed to “three-dimensional fabrication” systems, which is the same field identified in the '324 patent. EX1001, 1:14-20. Mazumder discloses that similar computer-aided

Pet., 12

## Mori is not Analogous Art

- There can be no dispute that Petitioner's clear theory stands in contrast to the petitions in *Corephotonics* that "were ambiguous" as to their theory

Apple's petitions were ambiguous; they did not make clear whether Apple was stating that Golan and Martin are in the same field of endeavor as the Challenged Patents or, instead, merely that Golan and Martin are in the same field of endeavor as one another.

*Corephotonics, Ltd. v. Apple Inc.*,  
84 F.4th 990, 1004-05 (Fed. Cir. 2023).

# Mori is not Analogous Art

- Petitioner’s untimely argument that Mori is reasonably pertinent to the problem of the ‘324 Patent is facially insufficient.
  - Petitioner does not identify the problem solved by Mori
  - Petitioner does not compare the problem solved by Mori to the problem of the ‘324 Patent.

Mori is also reasonably pertinent to the problem addressed by the ‘324 Patent of monitoring an automated process. EX1001, 8:49-51, 12:47-51, 14:63-15:5 (“The web-based user interface may permit video monitoring...”); EX1022, ¶¶19-20. Mori is reasonably pertinent to this problem because it describes a “machining status monitoring apparatus” that provides images of “the tool and workpiece” and “virtual two-dimensional image data” of the tool and workpiece. EX1005, Abstract, [0043], [0049]-[0050], [0059]-[0065].

Reply, 8

# Mori is not Analogous Art

- Petitioner was required to identify the problems in Mori and the '324 Patent and perform a comparison

Although the dividing line between reasonable pertinence and less-than-reasonable pertinence is context dependent, it ultimately rests on the extent to which the reference of interest and the claimed invention relate to a similar problem or purpose. *See, e.g., Wyers v. Master Lock Co.*, 616 F.3d 1231, 1238 (Fed. Cir. 2010) (concluding that prior art padlocks were analogous art because they “were clearly directed toward the same problem the inventor was

trying to solve in the” patent at issue); *GPAC*, 57 F.3d at 1578; *In re Clay*, 966 F.2d 656, 659 (Fed. Cir. 1992) (concluding that, where a “reference disclosure has the same purpose as the claimed invention, the reference relates to the same problem, and that fact supports use of that reference in an obviousness rejection”). Thus, when addressing whether a reference is analogous art with respect to a claimed invention under a reasonable-pertinence theory, the problems to which both relate must be identified and compared.

*Donner Tech., LLC v. Pro Stage Gear, LLC*, 979 F.3d 1353, 1359 (Fed. Cir. 2020).

# Mori is not Analogous Art

- Petitioner seeks to abstract the problem of the '324 Patent.
  - Petitioner contends the problem is “monitoring an automated process.”  
Reply, 8
- But it should not be permitted to do so, because the '324 Patent is directed to a specific technological issue

patent, the Board considered the specification, claims, and prosecution history in determining that the '792 patent related to the problem of facilitating trick play in streaming multimedia. To support its find-

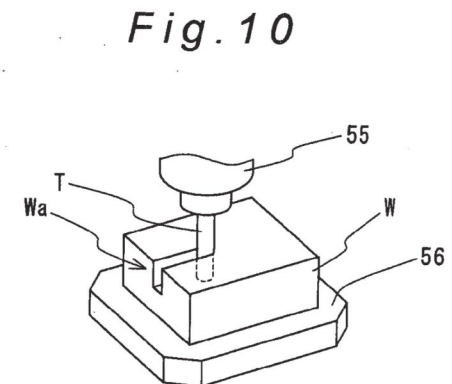
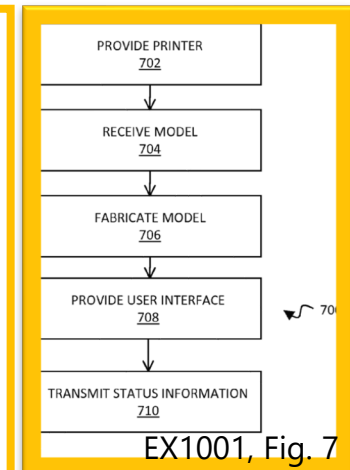
\* \* \*

Regarding Kaku, the Board found that it addressed a different problem than the '792 patent: the problem of image compression “to accommodate as lengthy a recording as possible in a camera’s internal memory.” J.A. 29. To reach this conclusion, the Board relied primarily on Kaku’s specification. Specifically, the Board cited

*Netflix, Inc. v. DivX, LLC*, 80 F.4th 1352, 1361-1362 (Fed. Cir., 2023).

# Mori is not Analogous Art

- Mori has a different function from the '324 Patent
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- Mori's function is **a machining status monitoring for a destructive machining tool that is hidden from view.**
  - EX1005, ¶¶[0004], [0021]-[0022], [0024]-[0025], [0085], Fig. 10; EX2009, ¶¶111-12



EX1005, Fig. 10

# Mori is not Analogous Art

- Therefore, Grounds 1A-1G fail because they all rely on Mori

| <u>Ground</u> | <u>Claims</u>              | <u>Basis for Rejection (35 U.S.C. § 103)</u> |
|---------------|----------------------------|----------------------------------------------|
| 1A            | 1, 3, 5-7, 9-10, and 19-22 | Mazumder+Mori                                |
| 1B            | 4                          | Mazumder+Mori+Tian                           |
| 1C            | 8                          | Mazumder+Mori+Hull                           |
| 1D            | 11                         | Mazumder+Mori+Seki                           |
| 1E            | 17                         | Mazumder+Mori+Waehner                        |
| 1F            | 18                         | Mazumder+Mori+Lan                            |
| 1G            | 20-22                      | Mazumder+Mori+Anderson                       |

# Overview of Argument

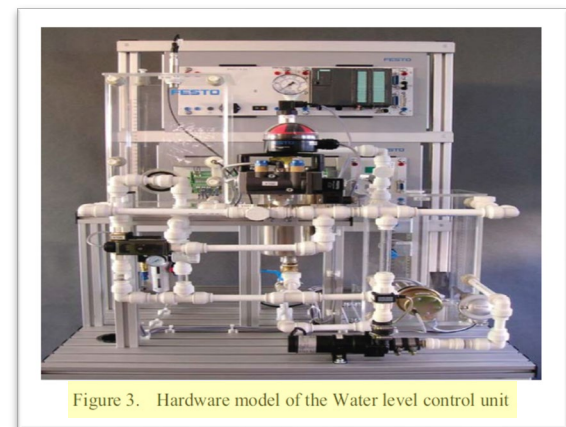
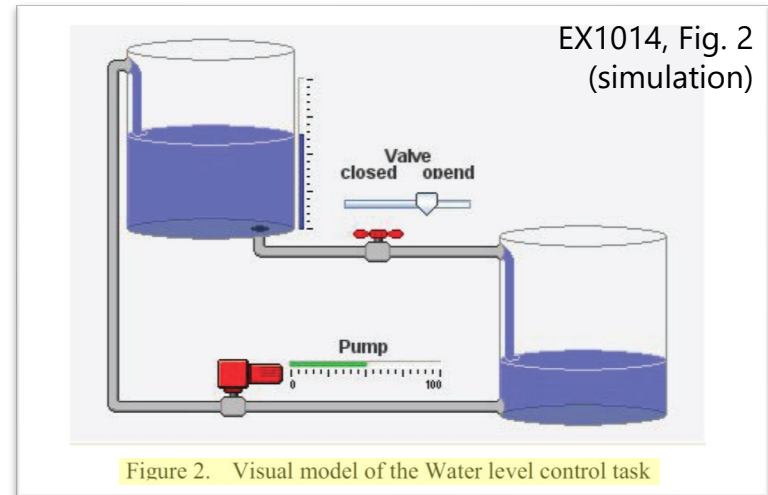
- I. Overview of the '324 Patent
- II. The '324 Patent Requires Presentation of Camera Image and Projection at the Same Time
- III. Mori is not Analogous Art
- IV. Henke is not Analogous Art**
- V. The Challenged Claims are Patentable Under Grounds 1A-1G
- VI. The Challenged Claims are Patentable Under Grounds 2A-2G

# Henke is not Analogous Art

- Henke discloses solutions for students to use simulation tools and existing hardware to “test a designed control algorithm.”

*Abstract*—This contribution describes a concept for an integration of microcontroller- and FPGA- based Rapid Prototyping modules into a Remote Lab system and its implementation. The implementation enables a Web-based access to control electro-mechanical models. The electro-mechanical models can be controlled by different platforms (microcontroller or FPGA-based) Students have the possibility to test a designed control algorithm directly within a hardware environment by uploading a source file to the Remote Lab server. That way the students can compare architectures of different control-platforms as well as different design approaches to control electro-mechanical models. The paper starts with an introduction into the design process and describes the tool set, which is provided to the students. After that the different platforms and their integration in the Web-server are introduced. Finally we would like to give examples of such complex design tasks and show, how the students can use different tools during several design steps.

EX1014 at 2



EX1014, Fig. 3 (existing hardware)

# Henke is not Analogous Art

- Petitioner's Reply presents conflicting fields of endeavor
  - First, it asserts that "Henke falls within the same general field of endeavor of the '324 Patent of '**rapid prototyping from computer models.**'" Reply, 8-9.
  - Second, it asserts that "Henke is directed towards the same field of endeavor of '**Web-based access to control electro-mechanical prototyping devices.**'" Reply, 9.

# Henke is not Analogous Art

- '324 Patent is in the field of three-dimensional printing or additive manufacturing
  - Structure: three-dimensional printer or additive fabrication device
  - Function: providing a user interface to a remote user that presents both an image of an object being fabricated from a model and projection of the model that is from the same point of view as the image
  - This subject matter is narrower than “rapid prototyping from computer models” and plainly different than “web-based access to control electro-mechanical prototyping devices”

See EX001, Title, Abstract, 1:34-35, 1:41-61; 1:65-2:5, 2:8-16, Figs. 1, 3-7, 24:43-25:5, 27:20-21, 28:31-33; EX2009, ¶¶166-171

# Henke is not Analogous Art

- In contrast, Henke is in the field of tools for simulating and testing control algorithms
  - Structure: system for testing a control algorithm (e.g., water level control) with a control unit (e.g., water level control unit)  
See EX1014, 1, 3, 5, Fig. 3; EX2009, ¶¶167-68
  - Function: remote tools for simulating, testing, and verifying functionality of control algorithms to allow students to achieve a fault-free algorithm  
See EX1014, 1 (“shared use of equipment,” “specialized software,” “simulators”), 3 (testing “on real electro-mechanical models”); EX2009, ¶173

EX1014, Fig. 3  
(existing hardware)

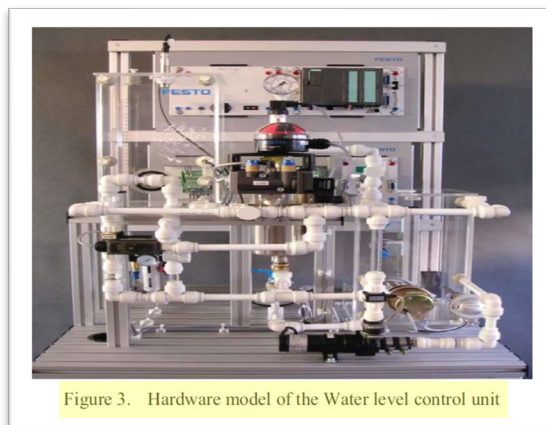
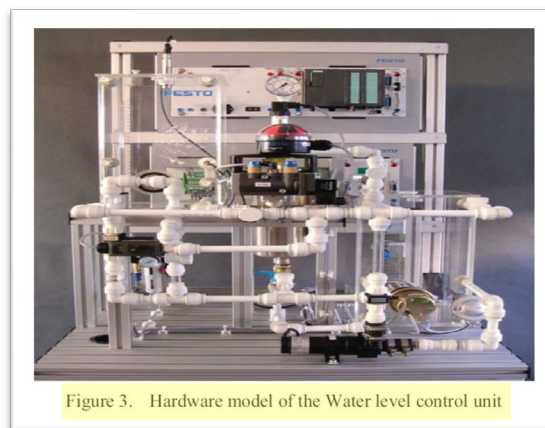


Figure 3. Hardware model of the Water level control unit

# Henke is not Analogous Art

- In contrast, Henke is in the field of tools for simulating and testing control algorithms
  - Henke does not describe or mention three-dimensional printing or explain why a three-dimensional printer would need to test a control algorithm  
See EX2009, ¶¶169-170
  - Similarly, nothing in the '324 Patent indicates a concern with simulating and testing control algorithms  
See EX2009, ¶¶170, 167-169, 171.



EX1014, Fig. 3

# Henke is not Analogous Art

- Henke’s “rapid prototyping modules” for a control algorithm are unrelated to the ’324 Patent’s ability to perform “rapid prototyping” by fabricating an object from a model.

fabricate any objects or build any objects. *See id.* Moreover, a POSITA would have recognized that the term “rapid prototyping” has many uses in different contexts. In the context of Henke, students are rapid prototyping a control algorithm. *See id.* But in the context of the ’324 Patent, a three-dimensional printer is printing an object and thus rapid prototyping objects that represent three-dimensional models. *See, e.g.,* EX1001, 1:16-18 (“A variety of three-dimensional fabrication techniques have been devised to support rapid prototyping from computer models.”); EX1014, Abstract (“This contribution describes a concept for an integration of microcontroller- and FPGA- based Rapid Prototyping modules into a Remote Lab system and its implementation.”). Thus, the use of the term “rapid prototyping” in Henke is not

EX2009, ¶174

# Henke is not Analogous Art

- Henke is not reasonably pertinent to the problem of the '324 Patent
- Petitioner was required to identify the problems in Henke and the '324 Patent and perform a comparison.  
*See Donner Tech., LLC v. Pro Stage Gear, LLC*, 979 F.3d 1353, 1359 (Fed. Cir. 2020).
- BUT, Petitioner failed to identify the problem solved by Henke and does not compare that problem in Henke to the problem of the '324 Patent

Henke is also reasonably pertinent to the problems addressed by the '324 Patent of remote control and monitoring of an automated process. EX1001, 8:3-6 (“...control by a remote computer”), 8:49-51, 12:47-51, 14:63-15:5 (“The web-based...video monitoring”); EX1022, ¶¶23-24. Henke describes a remote interface to “handle laboratory procedure...and watch the laboratory procedure by supervising the model and environmental variables inside an I/O monitor or by observing the hardware model directly via a Web-Cam” which are **both** shown in Figure 8 and thus is reasonably pertinent to the problem addressed by the '324 Patent. EX1014, 5. PO’s expert confirmed that students studying 3D printing would have also learned about remote operation and monitoring of networked machines in general. EX1027, 20:1-22:18.

Reply, 9

# Henke is not Analogous Art

- Henke was concerned with reducing travel and improving education by removing the “obstacles of cost, time-inefficient use of facilities, inadequate technical support and limited access to laboratories.”

It is more and more necessary to allow and organize a shared use of equipment, but also specialized software, for example simulators.

Users in the workplace can access the labs without travelling. This flexibility is important for tele-working, education and life long learning. Using online laboratories has the potential of removing the obstacles of cost, time-inefficient use of facilities, inadequate technical support and limited access to laboratories.

EX1014, 2

# Henke is not Analogous Art

- Henke was also concerned with undetected failures of control algorithms when only performing simulation
  - Solution: share real testing hardware between students to test special conditions contrary to simulation

Generally, only a simulation of predetermined malfunctions is possible. After some times all these effects are well known in the student's community. Unconsidered sources of errors lead to undetected failures of the control because the corresponding environmental situation was not simulated before [10].

That's why, a fault free design algorithm finally should be tested on real electro-mechanical models (e. g. the Water level control unit, shown in Figure 3) in the Remote Laboratory (*rapid prototyping*).

EX1014, 3

Assuming real laboratory conditions, disturbances can occur, causing special working conditions. Including such real disruptive factors to an algorithmic test leads in contrary to simulation to a distinctly closer relation to practical conditions. Furthermore, it should stimulate student's interest in the design of safety critical control

systems. Additionally, we would like to give the students the chance to verify their prepared control algorithms and to correct or modify them accordingly to the received results.

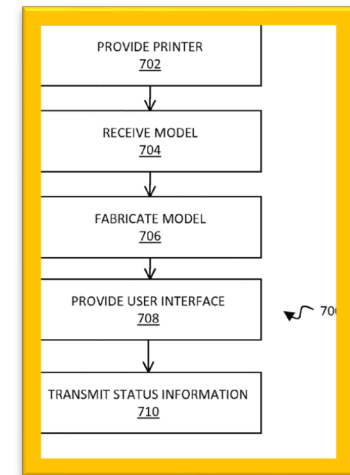
EX1014, 3-4

# Henke is not Analogous Art

- The inventor of the '324 Patent was concerned with enabling remote users to control and monitor three-dimensional printers fabricating three-dimensional objects.
  - Specifically, solving the problem of remote comparison between the object being fabricated from the model and the model itself

See EX1001, Abstract, 1:32-38, 1:41-61; 1:65-2:5, 2:8-16, Figs. 1, 3-7, 24:43-25:5, 27:20-21, 28:31-33; EX2009, ¶¶173, 174

- Solution: providing a user interface that presents both an image of the build volume where the model is being fabricated as an object in the 3D printer and a projection of the same model from the same point of view as the image.



EX1001, Fig. 7

# Henke is not Analogous Art

- ***In re Clay*, 966 F.2d 656, 659-660 (Fed. Cir. 1992)**

Sydansk's gel treatment of underground formations functions to fill anomalies<sup>1</sup> so as to improve flow profiles and sweep efficiencies of injection and production fluids through a formation, while Clay's gel functions to displace liquid product from the dead volume of a storage tank. Sydansk is

Such a problem is not reasonably pertinent to the particular problem with which Clay was involved—preventing loss of stored product to tank dead volume while preventing contamination of such product. Moreover, the subterranean formation of Sydansk is not structurally similar to, does not operate under the same temperature and pressure as, and does not function like Clay's storage tanks. See *In re Ellis*, 476

- ***Polygroup Ltd. MCO v. Willis Elec. Co., Ltd*, 759 F. App'x 934, 942 (Fed. Cir. 2019)**

Polygroup argues that none of the Board's findings above are supported by substantial evidence. We disagree. Although the challenged patents cover electrical connections between tubular portions of a device, those connections are all within the context of an artificial tree. The Board thus did not err in defining the field of endeavor as “artificial trees with decorative lighting.” J.A. 37. Similarly, the Board did not err

in defining the problem with which the inventor was faced as “assembly and disassembly ... as it relates to artificial trees.” *Id.* We agree with the Board that Jumo does not relate to artificial trees or decorative lighting, and Polygroup points to nothing in Jumo addressing the problem of convenient assembly or disassembly. Substantial evidence supports the

# Henke is not Analogous Art

- Similarly, Henke is not reasonably pertinent to the problem that faced the inventor of the '324 Patent
  - Henke's problems and solutions
    - Problems: travel, education, and undetected failures when only simulating control algorithms
    - Solutions: students to share remote hardware test equipment to test control algorithms
  - '324 Patent's problems and solutions
    - Problems: control and monitor three-dimensional printers fabricating three-dimensional objects
    - Solutions: provide a user interface with an image and projection from the same point of view, which enables a remote user to perform a side-by-side comparison
  - Different structures and functions
    - Henke -- remote tools for simulating, testing, and verifying the functionality of control algorithms to allow students to achieve a fault free design algorithm, including testing on shared hardware (e.g., water level control unit)
    - '324 Patent – three-dimensional printer that provides a user interface to a remote user that presents both an image of an object being fabricated from a model and projection of the model that is from the same point of view as the image

# Henke is not Analogous Art

- Therefore Grounds 2A-2G fail because they all rely on Henke

| <u>Ground</u> | <u>Claims</u>              | <u>Basis for Rejection (35 U.S.C. § 103)</u> |
|---------------|----------------------------|----------------------------------------------|
| 2A            | 1, 3, 5-7, 9-10, and 19-22 | Kritchman+Tay+Henke                          |
| 2B            | 4                          | Kritchman+Tay+Henke+Tian                     |
| 2C            | 8                          | Kritchman+Tay+Henke+Hull                     |
| 2D            | 11                         | Kritchman+Tay+Henke+Seki                     |
| 2E            | 17                         | Kritchman+Tay+Henke+Waehner                  |
| 2F            | 18                         | Kritchman+Tay+Henke+Lan                      |
| 2G            | 3, 5, 9-10, 20-22          | Kritchman+Tay+Henke+Anderson                 |

# Overview of Argument

- I. Overview of the '324 Patent
- II. The '324 Patent Requires Presentation of Camera Image and Projection at the Same Time
- III. Mori is not Analogous Art
- IV. Henke is not Analogous Art
- V. The Challenged Claims are Patentable Under Grounds 1A-1G**
- VI. The Challenged Claims are Patentable Under Grounds 2A-2G

# The Challenged Claims are Patentable Under Grounds 1A-1G

- Grounds 1A-1G further fail on the merits

| <u>Ground</u> | <u>Claims</u>                 | <u>Basis for Rejection (35 U.S.C. § 103)</u> |
|---------------|-------------------------------|----------------------------------------------|
| 1A            | 1, 3, 5-7, 9-10,<br>and 19-22 | Mazumder+Mori                                |
| 1B            | 4                             | Mazumder+Mori+Tian                           |
| 1C            | 8                             | Mazumder+Mori+Hull                           |
| 1D            | 11                            | Mazumder+Mori+Seki                           |
| 1E            | 17                            | Mazumder+Mori+Waehner                        |
| 1F            | 18                            | Mazumder+Mori+Lan                            |
| 1G            | 20-22                         | Mazumder+Mori+Anderson                       |

# The Challenged Claims are Patentable Under Grounds 1A-1G

- Petitioner presents three flawed theories:
  - (1) Mazumder's video satisfies both the image and projection under Petitioner's interpretation of infringement contentions  
*See Pet. 22 n.3*
  - (2) Mazumder-Mori combination teaches presenting the video camera and presenting virtual images at different times  
*See Pet. 22-23*
  - (3) Modifying combination of Mazumder and Mori to present the video camera and virtual images at the same time  
*See Pet. 23-24*

# The Challenged Claims are Patentable Under Grounds 1A-1G

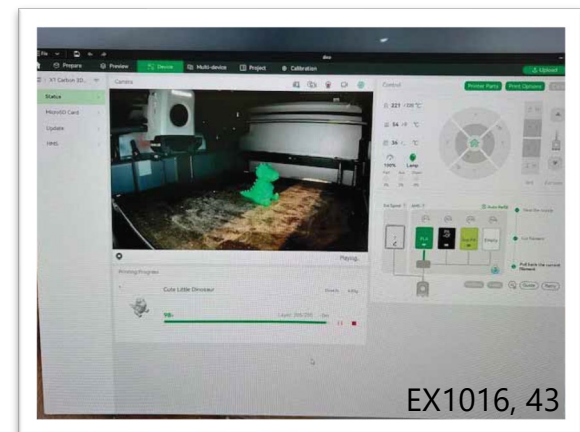
- Petitioner's first theory: Petitioner misinterprets infringement contentions
  - Contentions do not allege that same image(s) satisfy both the image and projection
  - They point to a "camera view" and "2-D projection of a 3-D model for [a] cute little dinosaur" and to a "time lapse"
  - No indication that the same image(s) satisfy the camera view and 2-D projection or time lapse  
See EX2009, ¶117; EX1016, 41-44, 46
  - For similar reasons, the combination does not teach claim 6 ("wherein the two-dimensional projection is a video image from the video camera") or Petitioner's alternative theory for claim 5.  
See POR, 48-50

## 1. Introduction to different modes of time-lapse

In the Bambu Studio, if you enable timelapse, a timelapse video will be generated for each print. After each layer is printed, a snapshot is taken by the chamber camera. All of these snapshots are composed into a timelapse video when printing completes.

There are two modes of timelapse: smooth mode and traditional mode. For different printers, there will be some differences in the action of shooting time-lapse photography, which is described as follows.

EX1016, 46



EX1016, 43

# The Challenged Claims are Patentable Under Grounds 1A-1G

Petitioner's second theory:

- Claims do not encompass presenting the video camera and presenting virtual images at different times
  - Plain meaning of claims requires a user interface that presents both the image and projection together from the same point of video at the same time.  
*See* POR, 36-37, 12-19
- Mazumder-Mori combination does not teach presenting an actual image and virtual image at the same time
  - Mazumder does not even display virtual images at all.  
*See* POR, 43; EX2009, ¶127 (citing EX1004, 6:30-43, 8:14-17; *see also id.* at 2:34-50, 7:27-28)
  - Mori only displays one type of image data at a time. *See* POR, 38-41

# The Challenged Claims are Patentable Under Grounds 1A-1G

Petitioner's second theory:

- Mori's first embodiment only displays one type of image at a time
  - Actual images displayed when tool is not hidden

129. Mori describes the first apparatus/method in its Abstract and Summary of the Invention. The first apparatus/method in Mori displays either actual images or sectional images depending on whether the tool is hidden. When the tool is not hidden, Mori's first apparatus/method always displays actual images. See EX1005, [0022] ("Therefore, actual images in which the distal end of the tool is not hidden

EX2009, ¶129

- Sectional images displayed when tool is hidden

[0024] In the case of hole machining or groove machining, the distal end of the tool is hidden by the workpiece. Therefore, even if a plurality of the actual imaging means is provided, the distal end of the tool is hidden by the workpiece in all of the actual two-dimensional image data generated by the actual imaging means. In this case, the operator cannot monitor the machining status of a workpiece through the images displayed on the display means.

[0025] Therefore, as described above, when it is configured so that sectional image data is displayed on the display means in the case where the distal end of the tool is hidden in all of

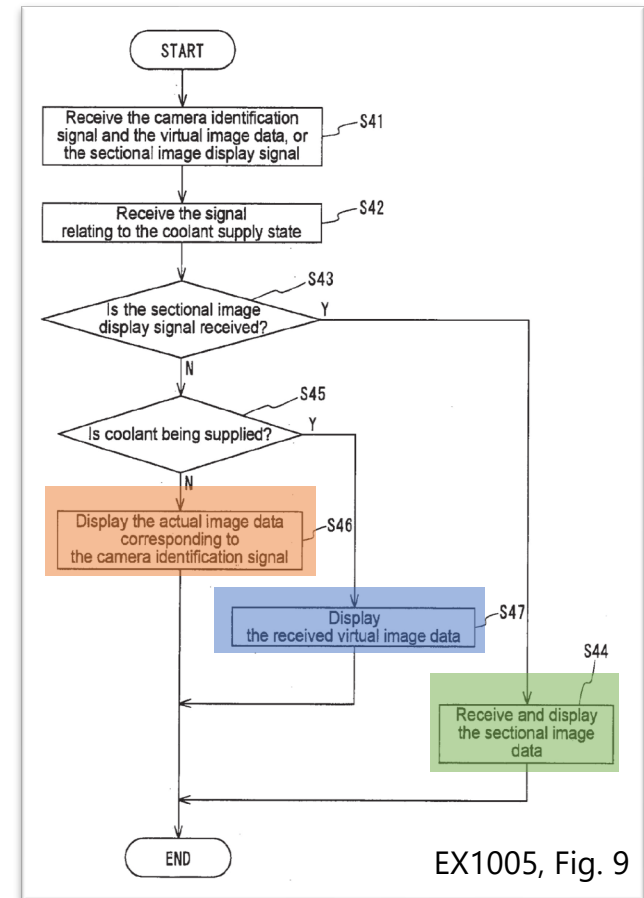
the virtual two-dimensional images, the operator can check the machining status of a workpiece.

EX1005, [0024]-[0025]

# The Challenged Claims are Patentable Under Grounds 1A-1G

Petitioner's second theory:

- Mori's second embodiment only displays one type of image at a time
  - **Actual images** displayed when tool is not hidden and when coolant is not being supplied (**S46**)
  - **Virtual images** displayed when coolant is being supplied (**S47**)
  - **Sectional images** displayed when a display signal is received (when tool is hidden) (**S44**)



# The Challenged Claims are Patentable Under Grounds 1A-1G

Petitioner's second theory:

- Petitioner's expert, Dr. Wolfe, failed to appreciate the complete teachings of Mori
  - could only point to Paragraphs 22 and 25 of Mori to support his opinion that "clearly the intent of Mori" was "to be able to compare [] two things" EX2010, 53:3-13
  - admitted that he failed to "give an opinion on Figure 9 of Mori" in his declaration EX2010, 53:14-55:14; *see also id.* at 61:5-11
  - erroneously believes "if there's a coolant problem" in Mori "it would be important to display the actual image" EX2010, 61:12-19
  - does not think Mori's teachings about "showing images are in any way dependent on ... cooling" EX2010, 63:6-9
  - "not sure" if Mori "gives any details" on display image switching section 25 and believes it is "an ordinary video switch" EX2010, 67:11-17

# The Challenged Claims are Patentable Under Grounds 1A-1G

- In contrast, Dr. Cormier fully explained Mori and its teachings
  - Provided a detailed overview that walks through Mori's two different disclosures/embodiments. *See* EX2009, Section VI.A (¶¶82-92)
  - Explained how Mori's first disclosure/embodiment operates by displaying actual images or sectional images but not both  
*See* EX2009, ¶¶129-131 (discussing EX1005 (Mori), [0022], [0029], [0024], [0023], Abstract, [0025]-[0028])
  - Explained how Mori's second disclosure/embodiment operates by displaying actual images, sectional images, or virtual images.  
*See* EX2009, ¶¶132-135 (discussing Mori's "Description of Embodiment" and explaining Figure 9 of Mori describes display switching section 25 in para. 132)
  - Explained that a person familiar with destructive machining tools would have understood coolant was "commonly used to cool the contact portion between the tool and workpiece" and "obstructs the view of the destructive machining tool"  
*See* EX2009, ¶133; EX2011, 1-2



EX1013, 1

# The Challenged Claims are Patentable Under Grounds 1A-1G

Petitioner's third theory:

- The Mori-Mazumder combination does not teach a modified system in which the actual and virtual images are displayed at the same time
  - Hindsight: Petitioner argues that combination teaches side-by-side comparison  
*See* Pet. 23, 11; POR, 44; Sur-Reply, 15; *Mintz v. Dietz & Watson, Inc.*, 679 F.3d 1372, 1377 (Fed. Cir. 2012); *see also AT&T Services Inc. et. Al. v. Innovative Sonic Ltd.*, IPR2024-01143 (PTAB Feb. 11, 2025)
  - Dr. Wolfe's testimony mirrors Petitioner's argument without evidence  
*See* EX1003, ¶113 and Pet. 23-24; EX2009, ¶137
    - Unsupported attorney argument / conclusory expert opinion cannot supplant evidence  
*See Estee Lauder Inc. v. L'Oreal, S.A.*, 129 F.3d 588, 595 (Fed. Cir. 1997);  
*Upjohn Co. v. Mova Pharm. Corp.*, 225 F.3d 1306, 1311 (Fed. Cir. 2000);  
*Carella v. Starlight Archery & Pro Line Co.*, 804 F.2d 135, 138 (Fed. Cir. 1986)
  - No motivation to modify the Mori-Mazumder combination for same-time display  
*See* POR, 45-46
    - Mazumder does not teach the display of any virtual images  
*See* POR, 45; EX1004, 2:34-50, 6:24-35, 7:27-28; EX2009, ¶138
    - Henke reference cited by Dr. Wolfe also fails to teach a visual comparison.  
*See* EX2009, ¶139; EX1003, ¶85; POR, 45
    - Mori teaches switching between images based on whether the tool is hidden or coolant is used

# The Challenged Claims are Patentable Under Grounds 1A-1G

- Mori teaches away from the '324 Patent, providing reason to not display actual and virtual images at the same time
  - Mori switches between different types of images for display:
    - First apparatus/method: display actual image or sectional image
    - Second apparatus/method: display actual image, virtual image, or sectional image

actual camera. As I explained above, Mori's first apparatus/method does not teach displaying the virtual image data (but rather teaches displaying the actual or sectional image data) and Mori's second apparatus/method does not teach displaying the actual and virtual images at the same time to allow for side-by-side comparison because Mori switches between them based on whether coolant is being supplied.

*See, e.g.* EX1005, Abstract, [0022]-[0029], Fig. 9, [0071]-[0073], [0087]; *supra* Section VI.B (Overview of Mori).

EX2009, ¶¶138

# The Challenged Claims are Patentable Under Grounds 1A-1G

- Incorrect to ignore Mori's express disclosure that teaches away from the claimed invention and rely on teachings from other references not concerned with the problems Mori sought to solve

(Fed. Cir. 1995) (citing *Wood*, 599 F.2d at 1036). Here, the Board appears to have ignored the express disclosure in Kaulbach that teaches away from the claimed invention and relied on teachings from other references that were not concerned with the particular problems Kaulbach sought to solve. In other words, the Board did not adequately grapple with why a skilled artisan would find it obvious to increase Kaulbach's melt flow rate to the claimed range while retaining its critical "very narrow molecular-weight distribution." Kaulbach col. 3 ll. 34–35, 59–65.

*Chemours Co. FC, LLC v. Daikin Indus., Ltd.*, 4 F.4th 1370, 1376-77 (Fed. Cir. 2021).

# The Challenged Claims are Patentable Under Grounds 1A-1G

- Petitioner's third obviousness theory fails (obvious to display image and projection at the same time)
  - Petitioner's proposed modification would require redesigning Mori's user interface and image-processing workflow to create a new combined display aligned in point of view and suitable for side-by-side comparison.

actual camera. As I explained above, Mori's first apparatus/method does not teach displaying the virtual image data (but rather teaches displaying the actual or sectional image data) and Mori's second apparatus/method does not teach displaying the actual and virtual images at the same time to allow for side-by-side comparison because Mori switches between them based on whether coolant is being supplied. *See, e.g.* EX1005, Abstract, [0022]-[0029], Fig. 9, [0071]-[0073], [0087]; *supra* Section VI.B (Overview of Mori).

EX2009 ¶¶138

# The Challenged Claims are Patentable Under Grounds 1A-1G

- Petitioner's argument regarding Claim 5 fails
  - No motivation to adapt Mazumder in the combination to include a dynamically updated projection
    - Petitioner skips over the differences between three-dimensional printing and destructive machining.
    - Unlike Mori, Mazumder's camera provides an unobstructed view during three-dimensional printing. See POR, 46-48
  - Petitioner's Reply attempts to pull in another reference (Anderson) into the ground. See Sur-Reply, 16; Reply, 16
  - Anderson does not teach dynamic updates that correspond "to a state of *physical completion* of the object." It merely updates based on printhead passes (i.e., progress of print job). See EX1012, [0018]

5. The device of claim 1 wherein the two-dimensional projection is dynamically updated to correspond to a state of physical completion of the object.

# The Challenged Claims are Patentable Under Grounds 1A-1G

- Petitioner's argument regarding Claim 6 fails

6. The device of claim 1 wherein the two-dimensional projection is a video image from the video camera.

- But Claim 6 requires showing an image of the build volume and a **distinct** video image from the video camera at the same time.
  - See, e.g., EX1001, 22:50-55 (digital still images and video images are different types of images), 22:61-23:2 (capturing a video image from the video camera).

print job. The visualization area **510** may also or instead show an image of a working volume of a three-dimensional printer or other fabrication resource captured during execution of the print job. This may, for example, include a digital still image (which may be updated periodically) or a video image captured from a video camera at the three-dimensional printer.

The user interface **500** may also include a menu bar **516** or the like for other functions not otherwise accounted for within the other active areas. This may include file information, search tools, help menus, user or account information, and so forth. This may include controls to share information about print activity. For example, the user interface may include at least one control to capture a frame of data from the video

camera as a video image and to transmit the video image to a remote location through the data network. The remote loca-

# The Challenged Claims are Patentable Under Grounds 1A-1G

149. Under Petitioner’s interpretation of the claims, the same images displayed and captured by a video camera would satisfy both claims 1 and 19, as well as claim 6. However, as I explained above for claim 1, there is no assertion that the same images satisfy both the image and projection in the claims. *Supra* Section VII.B (Claim 1); *see also* EX1016, at 41-44, 46. Therefore, Mazumder’s video cannot satisfy both the image and projection. *See id.*

- EX2009, ¶¶149-150.

150. Moreover, a POSITA would have recognized that the ’324 Patent does not suggest that the same images can be both the image and video image from the video camera. *See, e.g.*, EX1001, at 22:53-55 (“This may, for example, include a digital still image (which may be updated periodically) or a video image captured from a video camera at the three-dimensional printer.”), 22:66-23:2 (“For example, the user interface may include at least one control to capture a frame of data from the video camera as a video image and to transmit the video image to a remote location through the data network.”).

# The Challenged Claims are Patentable Under Grounds 1A-1G

- Grounds 1B-1G fail for the same reason as Ground 1A, because none present additional challenges to the independent claims

| <u>Ground</u> | <u>Claims</u>              | <u>Basis for Rejection (35 U.S.C. § 103)</u> |
|---------------|----------------------------|----------------------------------------------|
| 1A            | 1, 3, 5-7, 9-10, and 19-22 | Mazumder+Mori                                |
| 1B            | 4                          | Mazumder+Mori+Tian                           |
| 1C            | 8                          | Mazumder+Mori+Hull                           |
| 1D            | 11                         | Mazumder+Mori+Seki                           |
| 1E            | 17                         | Mazumder+Mori+Waehner                        |
| 1F            | 18                         | Mazumder+Mori+Lan                            |
| 1G            | 20-22                      | Mazumder+Mori+Anderson                       |

# The Challenged Claims are Patentable Under Grounds 1A-1G

- Claim 8 is patentable under Ground 1C (Mazumder+Mori+Hull)

**8.** The device of claim 1 wherein the processor is configured to provide **credential-based access** to the user interface.

- Pet. 33: alleges that remote user must provide password to access local fabrication system

A POSITA would have been prompted to apply Hull's teaching to the Mazumder-Mori combination to **require login credentials, including a password, to access the local computer of Mazumder's local site from the remote computer,**

***Claim [8]***

Hull discloses that **for a "Remote user" to access the local fabrication system, the user must "type your password and press enter."** EX1008, [0157];

# The Challenged Claims are Patentable Under Grounds 1A-1G

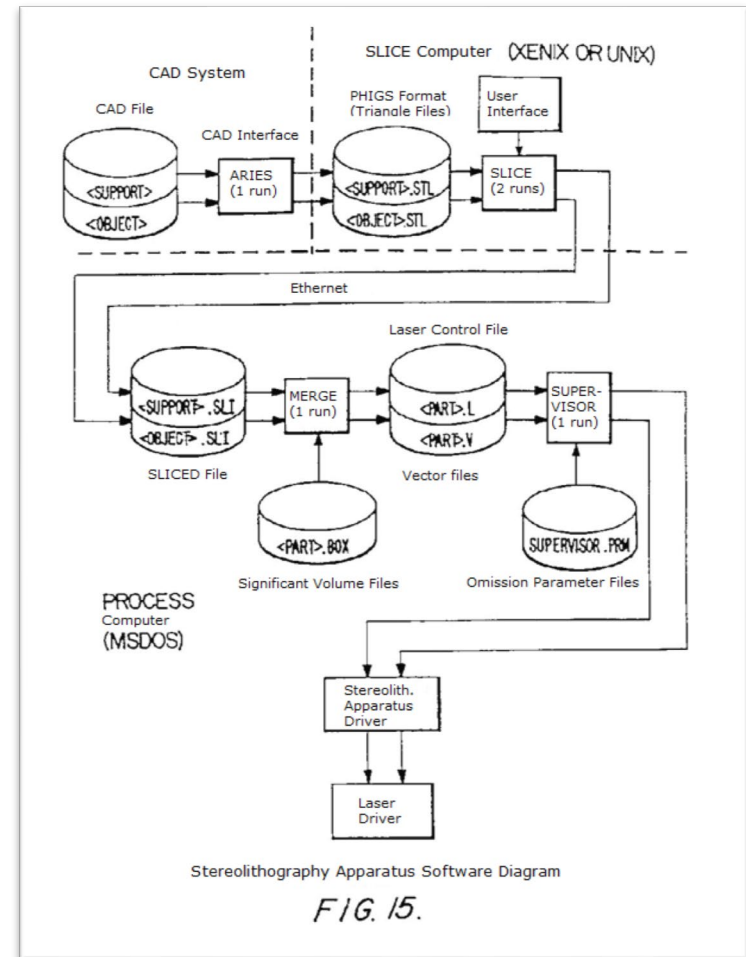
- Credential-based access to the local system is not required according to Hull's teachings.
  - See EX2009, ¶¶159-163.

*Id.* at [0157]. Thus, a POSITA would have understood that the “remote user” in Hull does not need a password to access the local fabrication system and three-dimensional printer because the user already has access to the local fabrication system and three-dimensional printer. Therefore, a POSITA would have understood that there is no rationale to require credential-based access for the remote user to access the local site with the local fabrication system / three-dimensional printer, or

EX2009, ¶162

# The Challenged Claims are Patentable Under Grounds 1A-1G

- Hull discloses that its “remote user” is at the fabrication system of the local site (at a process or control computer )
- The user connects to the remotely-located slice computer to get the sliced files from the slice computer to merge them.
  - EX1008, Fig. 15;
  - *See also* EX2009, ¶¶159-162



# The Challenged Claims are Patentable Under Grounds 1A-1G

- A remote user at the process/control computer then provides a password to access the slice computer at the provided address and then “gets” the sliced files from the slice computer to the process/control computer.

162. After entering the address of the slice computer, a POSITA would have understood that Hull’s “remote user” that is local at the process/control computer then provides a password to access the slice computer in order to “get” the sliced files from the slice computer to the process/control computer. This process is shown by the excerpt of Hull below.

EX2009, ¶162

d. In response to (ftp) prompt, type OPEN and press ENTER.  
e. In response to (to) prompt, type address of slice computer and press ENTER.  
f. In response to Remote user prompt, type the name of your directory and press ENTER.  
g. In response to Password prompt, type your password and press ENTER.  
h. In response to (ftp) prompt, type GET and press ENTER.  
i. In response to (remote-file) prompt, type name of desired file usually followed by .sli (example - test.sli) and press ENTER.  
j. In response to (local-fill test .sli in default) prompt, press ENTER (unless you want to change name). (The FTP routine will now transfer the file to the process computer. It will prompt when the transfer is complete.)  
k. To exit from FTP, in response to (ftp) prompt, type BYE and press ENTER. (The sliced files have now been transferred to the S/A-1 process computer.)

EX1008, [0157]

# Overview of Argument

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- V. The Challenged Claims are Patentable Under Grounds 1A-1G
- VI. The Challenged Claims are Patentable Under Grounds 2A-2G**

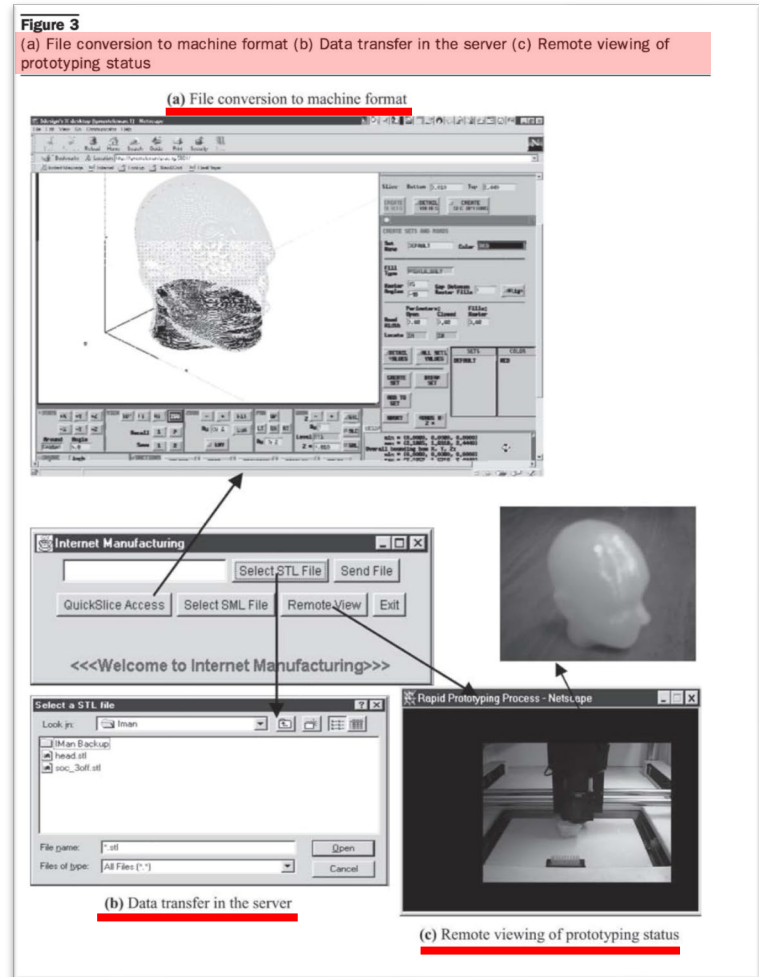
# The Challenged Claims are Patentable Under Grounds 2A-2G

- Grounds 2A-2G also fail on the merits.

| <u>Ground</u> | <u>Claims</u>              | <u>Basis for Rejection (35 U.S.C. § 103)</u> |
|---------------|----------------------------|----------------------------------------------|
| 2A            | 1, 3, 5-7, 9-10, and 19-22 | Kritchman+Tay+Henke                          |
| 2B            | 4                          | Kritchman+Tay+Henke+Tian                     |
| 2C            | 8                          | Kritchman+Tay+Henke+Hull                     |
| 2D            | 11                         | Kritchman+Tay+Henke+Seki                     |
| 2E            | 17                         | Kritchman+Tay+Henke+Waehner                  |
| 2F            | 18                         | Kritchman+Tay+Henke+Lan                      |
| 2G            | 3, 5, 9-10, 20-22          | Kritchman+Tay+Henke+Anderson                 |

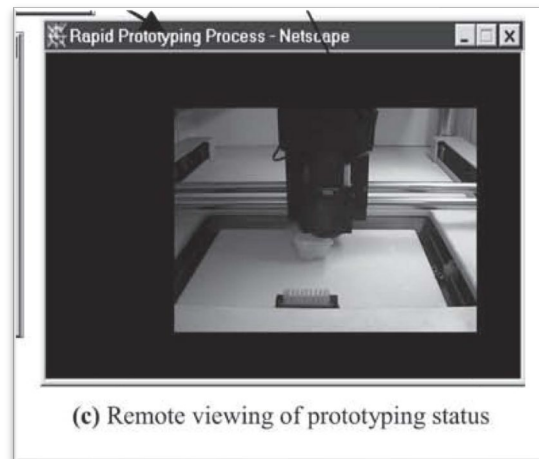
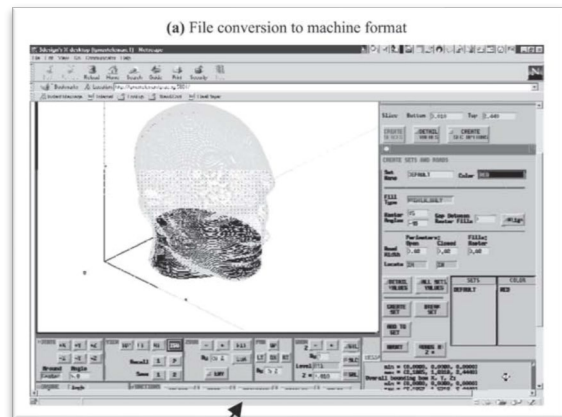
# The Challenged Claims are Patentable Under Grounds 2A-2G

- Grounds 2A does not teach the independent claims
- Figure 3 of Tay does not show or describe a user interface that presents both an image and projection from the same point of view at the same time. Rather, it teaches distinct steps: (a), (b), (c).
- Each step is performed at different times
  - EX1013 at 4-5.



# The Challenged Claims are Patentable Under Grounds 2A-2G

- Tay fails to teach two views from the same point of view
  - No teaching that remote viewing (step c) is from the same point of view as the purported projection (step a) or completed object on a table. See EX1013, Fig. 3.



- A POSITA would have recognized that the position of the image in step (a) does not match the position of the image in step (c) on the platform. See EX2009, ¶180.

# The Challenged Claims are Patentable Under Grounds 2A-2G

- There is no motivation to modify Kritchman or Tay based on Henke
- *Henke* does not teach the same-time display of an image **of the build volume** and a projection **of the three-dimensional model**
- Henke has no build volume or three-dimensional model to display an image of, and the image that is displayed is of the system as a whole.

See, e.g., EX1014, Fig. 8

- No 2-D projection of 3-D model fabricated by a 3-D printer
- No 2-D projection of what is shown in Henke's hardware view

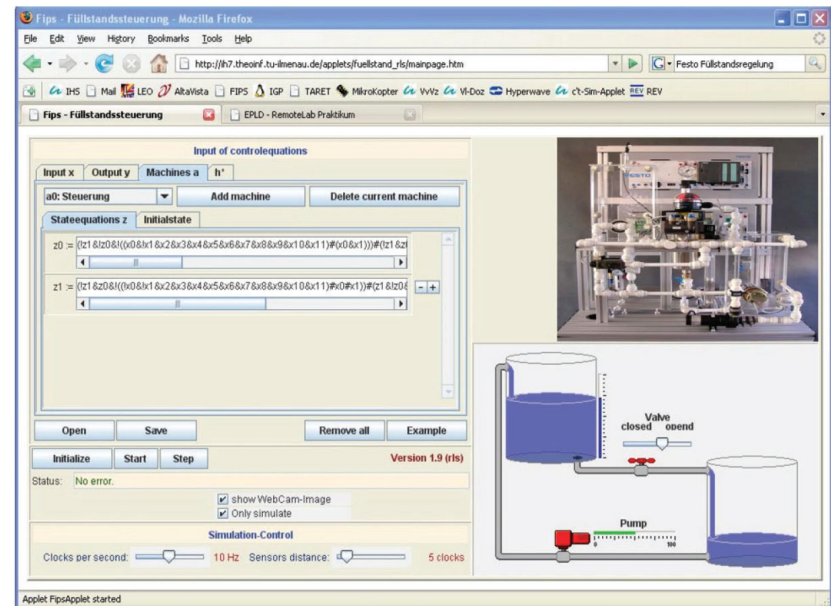


Figure 8. Online control of the Water level control - with Internet connectivity to the Remote Lab

# The Challenged Claims are Patentable Under Grounds 2A-2G

- No teaching or suggestion that Henke's simulation view and hardware view are from the same point of view.
- The simulation and hardware have no correspondence
  - Figure 8: simulation is operating and functional, but hardware is not operating or functional
- No rationale for providing a simulation and a video of the hardware from the same point of view or to compare the simulation to the video of the hardware
  - Henke teaches just observing the webcam or watching an I/O monitor, not a comparison

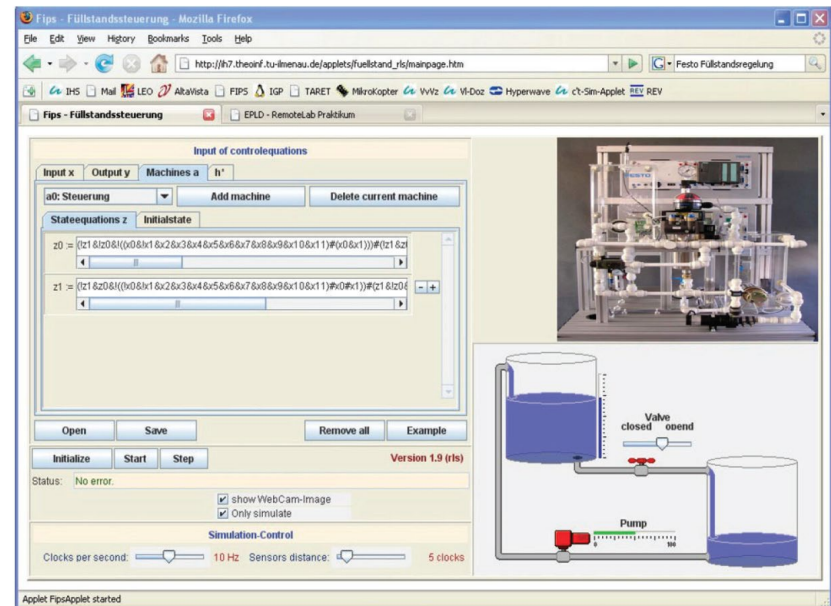


Figure 8. Online control of the Water level control - with Internet connectivity to the Remote Lab

# The Challenged Claims are Patentable Under Grounds 2A-2G

- Grounds 2B-2G fail for the same reason as Ground 2A, because none present additional challenges to the independent claims

| <u>Ground</u> | <u>Claims</u>              | <u>Basis for Rejection (35 U.S.C. § 103)</u> |
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| 2D            | 11                         | Kritchman+Tay+Henke+Seki                     |
| 2E            | 17                         | Kritchman+Tay+Henke+Waehner                  |
| 2F            | 18                         | Kritchman+Tay+Henke+Lan                      |
| 2G            | 3, 5, 9-10, 20-22          | Kritchman+Tay+Henke+Anderson                 |

# The Challenged Claims are Patentable Under Grounds 2A-2G

- Claims 3 and 5 survive for additional reasons.

3. The device of claim 1 wherein the two-dimensional projection is simulated based upon operation of the three-dimensional printer.

5. The device of claim 1 wherein the two-dimensional projection is dynamically updated to correspond to a state of physical completion of the object.

# The Challenged Claims are Patentable Under Grounds 2A-2G

- Henke is clear that the model is purely a simulation.
  - EX1014, 3. *See also* EX1014, 5.
- Figure 8 of Henke shows the hardware is not operating or functional unlike the simulation
  - *See* EX1014, 5; EX2009, ¶¶184-185
- Thus, Henke's online control can either simulate or test on hardware, not both at the same time.
- Therefore, the simulation cannot be **"dynamically updated to correspond to a state of physical completion of the object"** nor can the simulation be **"based upon operation of the three-dimensional printer"**

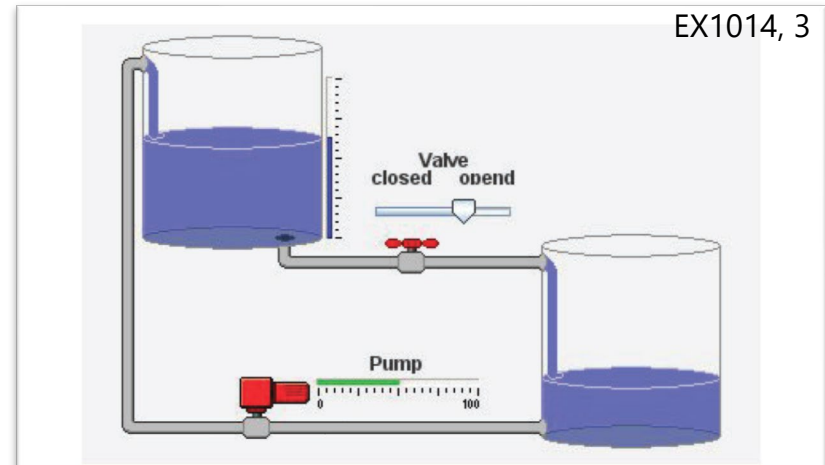


Figure 2. Visual model of the Water level control task

Generally, only a simulation of predetermined malfunctions is possible. After some times all these effects

That's why, a fault free design algorithm finally should be tested on real electro-mechanical models (e. g. the Water level control unit, shown in Figure 3) in the Remote Laboratory (*rapid prototyping*).

# The Challenged Claims are Patentable Under Grounds 2A-2G

- Claim 5 is also patentable under Ground 2G (Kritchman+Tay+Henke+Anderson), as the updates of Anderson are merely based on printhead passes and not the state of physical completion of the object
  - EX1012, [0018].
  - *See also* EX2009, ¶¶ 192-194

[0018] The interface controller 104 can take the form of a print server which receives print job progress information from the printer(s) and then provides this information to the user's computer via web pages or other active (real time) windows. After each pass of the printheads, the printer updates a status register. The status register has a "pass number" which is the number of passes completed by the printhead. The print server (and/or driver), which preferably has already rendered a 3D wireframe model representation of the 3D object being printed, calculates how many passes are required to complete the job. At a specified interval, the server polls the printer for the pass number. After each polling, the 3D wireframe model representation is re-rendered to show the completed portion as a filled-in (e.g., solid colored) area. It should be noted that the printer can "push" the pass information to the server, as well as having the server "pull" it. Alternatively, the above-described functionality can be implemented via the printer driver (i.e., the print server is not used to perform these functions).

# The Challenged Claims are Patentable Under Grounds 2A-2G

- Petitioner's argument regarding Claim 6 fails
  - Petitioner points to the same image for both the image in claims 1 and 19 and the video image of claim 6. See Pet. 71, 76
  - There is no reason why the same image(s) or video satisfies both the image and projection. See POR, 74-75
  - Nothing in the '324 Patent suggests the same image can be both the image and video image. See EX2009, ¶¶187-188, 117

print job. This may, for example, include a digital still image (which may be updated periodically) or a video image captured from a video camera at the three-dimensional printer.

EX1001, 22:53-55

print activity. For example, the user interface may include at least one control to capture a frame of data from the video

camera as a video image and to transmit the video image to a remote location through the data network. The remote loca-

EX1001, 22:66-23:2

# The Challenged Claims are Patentable Under Grounds 2A-2G

- Claim 8 is patentable under Ground 2C (Kritchman+Tay+Henke+Hull), as like in Ground 1G, Hull does not teach credential-based access.
  - See EX2009, ¶¶195-199.

199. As I explained for Ground 1C which also involved the proposed application of Hull, I disagree with Petitioner and its expert. *Supra* Section IX. A POSITA would have understood that Hull does not disclose that a remote user must enter a password to access the local fabrication system for a three-dimensional

printer. Rather, a POSITA would have understood that the “remote user” that is local to the fabrication system and three-dimensional printer already has access to the local fabrication system and three-dimensional printer and thus there would be no reason for credentials to access the local fabrication system and three-dimensional printer in the combination of Ground 2C. See EX1008, [0458], [0508], [0143], [0248], [0337], Figs. 46-47, [0157], [0499]. Accordingly, the combination in Ground