Patent Owner Stratasys, Inc.'s Presentation July 13, 2026

IPR2025-00611— U.S. Patent No. 11,886,774

Overview of Argument

I. Overview of the '774 Patent

II. Overview of the Purported Prior Art

III. The Challenged Claims are Patentable Under Ground 1A

IV. The Challenged Claims are Patentable Under Ground 1B

V. The Challenged Claims are Patentable Under Ground 1C

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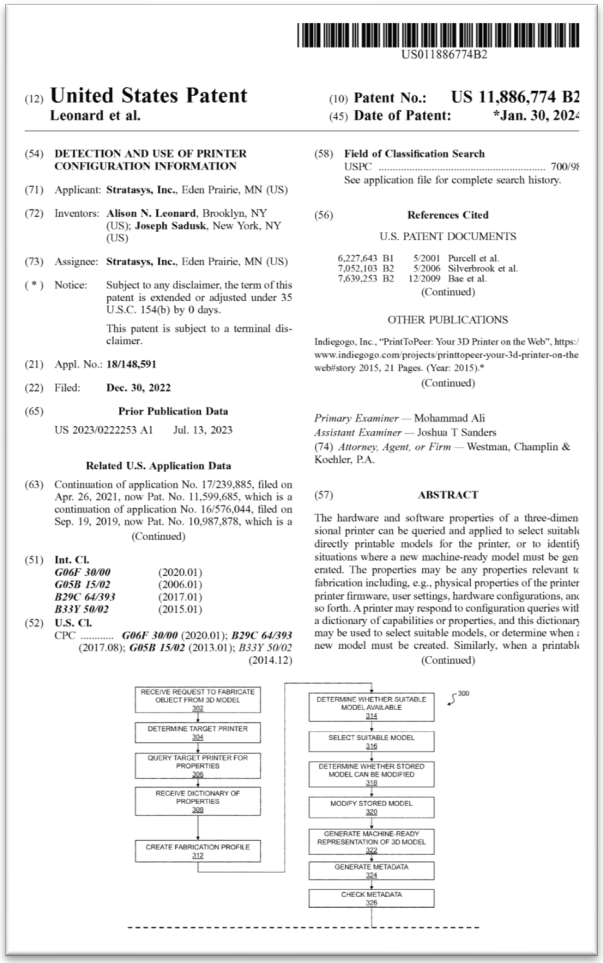
VII. Evans and KISSlicer are not Printed Publications

VIII. The Challenged Claims are Patentable Under Ground 2A

IX. The Challenged Claims are Patentable Under Grounds 2B-2E

Overview of the '774 Patent: Detection and Use of Printer Configuration Information

- Petitioner challenges independent claim 1 under only Grounds 1A and 2A.



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(12) **United States Patent**
Leonard et al.

(10) **Patent No.: US 11,886,774 B2**
(45) **Date of Patent: *Jan. 30, 202**

(54) **DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION**

(71) Applicant: **Stratasys, Inc.**, Eden Prairie, MN (US)

(72) Inventors: **Alison N. Leonard**, Brooklyn, NY (US); **Joseph Sadusk**, New York, NY (US)

(73) Assignee: **Stratasys, Inc.**, Eden Prairie, MN (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **18/148,591**

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(63) Continuation of application No. 17/239,885, filed on Apr. 26, 2021, now Pat. No. 11,599,685, which is a continuation of application No. 16/576,044, filed on Sep. 19, 2019, now Pat. No. 10,987,878, which is a (Continued)

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G06F 30/00 (2020.01)
G05B 15/02 (2006.01)
B29C 64/393 (2017.01)
B33Y 50/02 (2015.01)

(52) **U.S. Cl.**
CPC ***G06F 30/00*** (2020.01); ***B29C 64/393*** (2017.08); ***G05B 15/02*** (2013.01); *B33Y 50/02* (2014.12)

(58) **Field of Classification Search**
USPC 700/98
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,227,643 B1 5/2001 Purcell et al.
7,052,103 B2 5/2006 Silverbrook et al.
7,639,253 B2 12/2009 Bae et al.
(Continued)

OTHER PUBLICATIONS

Indiegogo, Inc., "PrintToPeer: Your 3D Printer on the Web", https://www.indiegogo.com/projects/printtopeer-your-3d-printer-on-the web#story 2015, 21 Pages. (Year: 2015).*
(Continued)

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(57) **ABSTRACT**

The hardware and software properties of a three-dimen sional printer can be queried and applied to select suitabl directly printable models for the printer, or to identify situations where a new machine-ready model must be gen erated. The properties may be any properties relevant t fabrication including, e.g., physical properties of the printer printer firmware, user settings, hardware configurations, an so forth. A printer may respond to configuration queries wit a dictionary of capabilities or properties, and this dictionary may be used to select suitable models, or determine when a new model must be created. Similarly, when a printabl
(Continued)

1. A method comprising:

receiving a request to fabricate an object from a three-dimensional model;

determining a target printer to fabricate the object;

querying the target printer for configuration information of the target printer relevant to creation of a printable model for fabrication of the object on the target printer;

receiving, from the target printer, a dictionary of configuration information containing one or more properties from the target printer that affect fabrication capabilities of the target printer;

creating a fabrication profile based on the one or more properties; and generating a machine-ready representation of the three-dimensional model

executable by the target printer to fabricate the object.

Overview of the '774 Patent: Detection and Use of Printer Configuration Information

- Petitioner also challenges dependent claims 6-8 and 19.

4. The method of claim **1** wherein the one or more properties include a hardware configuration of the target printer.

6. The method of claim **4** wherein the hardware configuration includes an automatically detected hardware reconfiguration.

7. The method of claim **4** wherein the hardware configuration includes a manually specified hardware reconfiguration.

8. The method of claim **1** wherein the one or more properties include a firmware configuration of the target printer.

19. The method of claim **1** further comprising generating descriptive metadata to accompany the machine-ready representation, the descriptive metadata specifying one or more properties for comparison to properties of printers selected for fabricating the model.

Overview of the '774 Patent

- In totality, Petitioner challenges claims 1-10, 12-13, and 19-20.

Ground	Claims	Basis for Rejection (35 U.S.C. § 103)
1A	1-5, 9-10, 12-13, 20	Douglas and Mark
1B	6-7, 9-10	Douglas, Mark and Dahlin
1C	8	Douglas, Mark and Batchelder
1D	19	Douglas, Mark and Pax
2A	1-5, 9-10, 12-13	Hamilton and Evans (with/without KISSlicer)
2B	6-7, 19	Hamilton, Evans and Pax (with/without KISSlicer)
2C	19	Hamilton, Evans, Pax, and Pettis (with/without KISSlicer)
2D	8	Hamilton, Evans and Batchelder (with/without KISSlicer)

Ground	Claims	Basis for Rejection (35 U.S.C. § 103)
2E	20	Hamilton, Evans and Wang (with/with-out KISSlicer)

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VIII. The Challenged Claims are Patentable Under Ground 2A

IX. The Challenged Claims are Patentable Under Grounds 2B-2E

Overview of the Purported Prior Art

- Petitioner asserts 10 references, with the below claimed priority and publication dates.
  - Douglas, Mark, Dahlin, Batchelder, Hamilton, Pax, Pettis, and Wang are patent publications.
    - EX-1005 (Douglas), EX-1006 (Mark), EX-1008 (Dahlin), EX-1007 (Batchelder), EX-1010 (Hamilton), EX-1013 (Pax), EX-1009 (Pettis), EX-1014 (Wang)
  - Evans and KISSlicer are not patent publications
    - Evans is a book (EX-1011)
    - KISSlicer is a "Quick Start Guide" (EX-1012)

Reference	Priority Date	Publication Date
Douglas	Oct.-29-2012	May-1-2014
Mark	Mar.-22-2013	Jul.-4-2017
Dahlin	Jan.-26-1998	Jun.-18-2008
Batchelder	Nov.-19-2009	May-8-2014
Hamilton	Apr.-16-2014	Aug.-21-2014
Evans	-	2012
KISSlicer	-	Jan.-2012
Pax	Sep.-7-2012	Mar.-13-2014
Pettis	Jun.-8-2012	Dec.-12-2013
Wang	Aug.-29-2014	Jan.-9-2018

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VIII. The Challenged Claims are Patentable Under Ground 2A

IX. The Challenged Claims are Patentable Under Grounds 2B-2E

The '774 Patent Claims Determining a Target Printer and then Querying the Target Printer

- The plain language of claim 1 recites determining "a" target printer, then querying "the" target printer for configuration information "of the target printer."

1. A method comprising:
receiving a request to fabricate an object from a three-dimensional model;
determining a target printer to fabricate the object;
querying the target printer for configuration information of the target printer relevant to creation of a printable model for fabrication of the object on the target printer;
receiving, from the target printer, a dictionary of configuration information containing one or more properties from the target printer that affect fabrication capabilities of the target printer;
creating a fabrication profile based on the one or more properties; and generating a machine-ready representation of the three-dimensional model
executable by the target printer to fabricate the object.

POR, 13–15; PO Sur-Reply, 3–5.

The '774 Patent Claims Determining a Target Printer and then Querying the Target Printer

- *TALtech Ltd. v. Esquel Apparel, Inc.*, 279 F. App'x 974, 978 (Fed. Cir. 2008).

> that step (e) of claim 1 is performed before step (c). Generally, there is no presumption of order, and so a claim with many steps can be infringed by an accused process performing the claimed steps in any order. However, we will find that the claim requires an ordering of steps when the claim language, as a matter of logic or grammar, requires that the steps be performed in the order written, or the specification directly or implicitly requires such a narrow construction. *Altiris, Inc. v. Symantec Corp.*, 318 F.3d 1363, 1369–70 (Fed.Cir.2003) (citing *Interactive Gift Express, Inc. v. Compuserve Inc.*, 256 F.3d 1323, 1343 (Fed.Cir.2001)). As the district court found,

POR, 13-15; PO Sur-Reply, 3-5.

The '774 Patent Claims Determining a Target Printer and then Querying the Target Printer

- *TALtech Ltd. v. Esquel Apparel, Inc.*, 279 F. App'x 974, 978 (Fed. Cir. 2008).

claim 18 is one such claim. The district court found that steps (d) and (e) of claim 18 must be performed after step (b). These

The logic and grammar of the claim make the requirement of an order clear. We agree with the district court that step

(b) placing a bonding element having at least a thermal adhesive component along the seam such that a lower surface of the bonding element abuts an upper surface of the first garment component;

...

(d) folding the first garment component over the bonding element such that the upper surface of the first garment component is folded over and abuts an upper surface of the bonding element;

(e) folding a portion of the second garment component such that a lower surface of the second garment component abuts the lower surface of the bonding element

POR, 13-15; PO Sur-Reply, 3-5.

The '774 Patent Claims Determining a Target Printer and then Querying the Target Printer

- *Altiris, Inc. v. Symantec Corp.*, 318 F.3d 1363, 1369–70 (Fed. Cir. 2003) (cited by *TALtech Ltd. v. Esquel Apparel, Inc.*, 279 F. App'x 974, 978 (Fed. Cir. 2008).

> *Interactive Gift* recites a two-part test

1:

> order in which they are written. *Id.* First, we look to the claim language to determine if, as a matter of logic or grammar, they must be performed in the order written. *Id.* at 1343, 256 F.3d 1323, 59 USPQ2d at 1416. For example, in *Loral Fairchild*

2:

> performed). If not, we next look to the rest of the specification to determine whether *it* "directly or implicitly requires such a narrow construction." *Interactive*

POR, 13-15; PO Sur-Reply, 3-5.

The '774 Patent Claims Determining a Target Printer and then Querying the Target Printer

- The printer must already be the target printer when it is queried
  - "The" target printer in [1.3] takes its antecedent basis from "a" target printer determined in [1.2]
  - Element [1.3] queries the target printer "for configuration information of the target printer"
  - The configuration information is "relevant to creation of a printable model for fabrication of the object on the target printer" referring to [1.2], which is for "determining a target printer to fabricate the object"

1. A method comprising:
receiving a request to fabricate an object from a three-dimensional model;
determining a target printer to fabricate the object;
querying the target printer for configuration information of the target printer relevant to creation of a printable model for fabrication of the object on the target printer;
receiving, from the target printer, a dictionary of configuration information containing one or more properties from the target printer that affect fabrication capabilities of the target printer;
creating a fabrication profile based on the one or more properties; and generating a machine-ready representation of the three-dimensional model
executable by the target printer to fabricate the object.

POR, 14; PO Sur-Reply, 4-5.

The '774 Patent Claims Determining a Target Printer and then Querying the Target Printer

- Petitioner reads "querying the target printer" as "querying a printer" so long as the printer is later chosen as a target printer
- BUT rewriting the claim to "querying the printer" renders "target" in "querying the target printer" meaningless

1. A method comprising:

* * *

querying the ~~target~~ printer for configuration information of the ~~target~~ printer relevant to creation of a printable model for fabrication of the object on the ~~target~~ printer;

PO Sur-Reply, 4-5; Reply, 1-3.

The '774 Patent Claims Determining a Target Printer and then Querying the Target Printer

- A construction that renders claim language meaningless is improper. *In re Power Integrations, Inc.*, 884 F.3d 1370, 1376–77 (Fed. Cir. 2018).

> Another problem with the board's claim construction is that it renders claim language meaningless. As discussed above, claim 1 begins by reciting a "circuit" that includes both a counter and a digital to analog converter. J.A. 817. The phrase "the digital to analog converter [is] coupled to the counter," J.A. 817, would be superfluous if, as the board said, it means only that the two components are in the same circuit. *See, e.g., Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 950–51 (Fed. Cir. 2006)

PO Sur-Reply, 4-5.

The '774 Patent Claims Determining a Target Printer and then Querying the Target Printer

- Querying "other printers" does not change the claim language that requires querying the target printer
  - Reply, 2.

> evidence" may overcome this presumption, there is no such evidence here. *Id.* As the '774 patent makes clear, the selection of a target printer may be informed by the queries sent to other printers.[1] EX-1001, 19:5-14. This makes logical sense when considered in view of the claims, as a selection of a target printer implies the existence of at least one other candidate printer. *Id.* Claim 1 is a "comprising"

PO Sur-Reply, 4.

The '774 Patent Claims Determining a Target Printer and then Querying the Target Printer

- Avoiding the claim language, Dr. Hickner testified that a query can be "sent out to a group of printers" which "may not [include] the target printer"
  - EX2015, 15:6–19
- That theory confirms that Petitioner is improperly rewriting the claim
  - Querying non-target printers does not change the claim language that requires querying the target printer

Q And would you be able to query a target printer before you have determined the target printer?

A So, again, there's no order in querying or determining in this claim language, and so, I think in sort of thinking about this, so you can query lots of different printers, one of those might be the target printer. And so, a query can be sent out to a group of printers. One of those may or may not be the target printer. And, then, either before or after, you can determine the target printer to fabricate the object. But there's no order implied in these -- in these two limitations.

PO Sur-Reply, 4–5.

The Challenged Claims are Patentable Under Ground 1A

- Ground 1A challenges claims 1-5, 9, 10, 12, 13, and 20.
- Because Ground 1A does not reach claim 1, every dependent claim and every dependent ground (1B-1D) also fails.

Ground	Claims	Basis for Rejection (35 U.S.C. § 103)
1A	1-5, 9-10, 12-13, 20	Douglas and Mark
1B	6-7, 9-10	Douglas, Mark and Dahlin
1C	8	Douglas, Mark and Batchelder
1D	19	Douglas, Mark and Pax

The Challenged Claims are Patentable Under Ground 1A

- Douglas-Mark fails to teach limitations [1.2]/[1.3], [1.4], and [1.5] of independent claim 1.

1. A method comprising:
receiving a request to fabricate an object from a three-dimensional model;
determining a target printer to fabricate the object;
querying the target printer for configuration information of the target printer relevant to creation of a printable model for fabrication of the object on the target printer;
receiving, from the target printer, a dictionary of configuration information containing one or more properties from the target printer that affect fabrication capabilities of the target printer;
creating a fabrication profile based on the one or more properties; and generating a machine-ready representation of the three-dimensional model
executable by the target printer to fabricate the object.

EX1001, cl. 1

The Challenged Claims are Patentable Under Ground 1A

- Douglas-Mark fails to teach limitations [1.2]/[1.3] of independent claim 1.

1. A method comprising:
receiving a request to fabricate an object from a three-dimensional model;
determining a target printer to fabricate the object;
querying the target printer for configuration information of the target printer relevant to creation of a printable model for fabrication of the object on the target printer;
receiving, from the target printer, a dictionary of configuration information containing one or more properties from the target printer that affect fabrication capabilities of the target printer;
creating a fabrication profile based on the one or more properties; and generating a machine-ready representation of the three-dimensional model
executable by the target printer to fabricate the object.

EX1001, cl. 1

The Challenged Claims are Patentable Under Ground 1A – Douglas-Mark Does Not Teach [1.2] / [1.3]

- The Petition's cited embodiments of Douglas query printers *first* in order to allocate jobs *second*.
- Douglas uses queried information "as an input to a process … for allocating print requests to various three-dimensional printers."
  - EX1005, ¶[0074]

> object **314**. In another aspect, a print server **208** may request build material information from one or more supplies coupled to a three-dimensional printer, and may store this information and make this information available to users of the print server, or as an input to a process on the print server for allocating print requests to various three-dimensional printers. More generally, data available from data tags **304** on supplies **302** may be used within the networked three-dimensional printing environment **200** to facilitate the distribution and execution of print requests in any desired manner.

POR, 13-16; PO Sur-Reply, 5-6.

The Challenged Claims are Patentable Under Ground 1A – Douglas-Mark Does Not Teach [1.2] / [1.3]

- The Petition maps Douglas's "print server 208" as the actor that determines and queries.
  - Pet., 12-13.

[1.2]

Douglas discloses that its "print server 208" can "automatically select one of the three-dimensional printers 204 for a user-submitted print job…for fabricating an object." EX-1005, ¶¶[0032], [0038]-[0043], [0073], FIG.2. The "print server 208" would ***"determine[] a target printer to fabricate the object"*** by "automatically select[ing]" a printer. EX-1005, ¶¶[0032], [0038]-[0043], [0073]; EX-1003, ¶49.

[1.3]

Per claims [1.4], 4 and 5 of the '774 pate

mation containing one or more properties" encompasses at least "***a build material type***." *See also*, EX-1001, 22:56-23:5; EX-1003, ¶50.

Douglas discloses that the print server can "request the three dimensional printer 306 to transmit the data tag 304 data for one or more of the connected supplies 302 for the determination of operational parameters" ("***querying the target printer for configuration information of the target printer***"). EX-1005,

PO Sur-Reply, 6-7.

The Challenged Claims are Patentable Under Ground 1A – Douglas-Mark Does Not Teach [1.2] / [1.3]

- The print server queries and gets tag data from the printer before determining the target printer, as the information received is used "for allocating print request to various three-dimensional printers."
  - EX1005, ¶[0074].

object **314**. In another aspect, a print server **208** may request build material information from one or more supplies coupled to a three-dimensional printer, and may store this information and make this information available to users of the print server, or as an input to a process on the print server for allocating print requests to various three-dimensional printers. More generally, data available from data tags **304** on supplies **302** may be used within the networked three-dimensional printing environment **200** to facilitate the distribution and execution of print requests in any desired manner.

POR, 13-16; PO Sur-Reply, 6-7.

The Challenged Claims are Patentable Under Ground 1A – Douglas-Mark Does Not Teach [1.2] / [1.3]

- The user-selection embodiment does not use the print server.
- It uses a different "remote client device 206."
  - EX1005, ¶73.

[0073] As a non-limiting example, a remote client device **206** may request an object **314** be printed on the network connected three-dimensional printer **306**. The three-dimensional printer **306** may have one or more supplies **302**, containing build material **312**, connected to one or more couplings **308**. The client device **206** may request the three-dimensional printer **306** to transmit the data tag **304** data for one or more of the connected supplies **302** for the determination of operational parameters for at least one of the connected supplies **302**. The client device **206** may select which of the one or more supplies **302** to use in fabricating the object **314**, determine the operational parameters for the selected supply **302**, and transmit the operational parameters back to the three-dimensional printer **306** for fabrication of the object **314**.

PO Sur-Reply, 6-7.

The Challenged Claims are Patentable Under Ground 1A – Douglas-Mark Does Not Teach [1.2] / [1.3]

- The Petition never maps a "remote client device" to any claim step.
  - *See, e.g.*, Pet. at 12.

[1.2]

Douglas discloses that its "print server 208" can "automatically select one of the three-dimensional printers 204 for a user-submitted print job…for fabricating an object." EX-1005, ¶¶[0032], [0038]-[0043], [0073], FIG.2. The "print server 208" would ***"determine[] a target printer to fabricate the object"*** by "automatically select[ing]" a printer. EX-1005, ¶¶[0032], [0038]-[0043], [0073]; EX-1003, ¶49.

PO Sur-Reply, 6-7.

The Challenged Claims are Patentable Under Ground 1A – Douglas-Mark Does Not Teach [1.2] / [1.3]

- Petitioner brings a new theory in its Reply, that the print server's "virtual workspace" user performs the determining step.
- This is improper and **still** does not show the print server determining a target printer before querying it.
- The "print server 208" and "client device 206" are separate components
  - EX1005, Fig. 2.

Print server 208

Client device 206

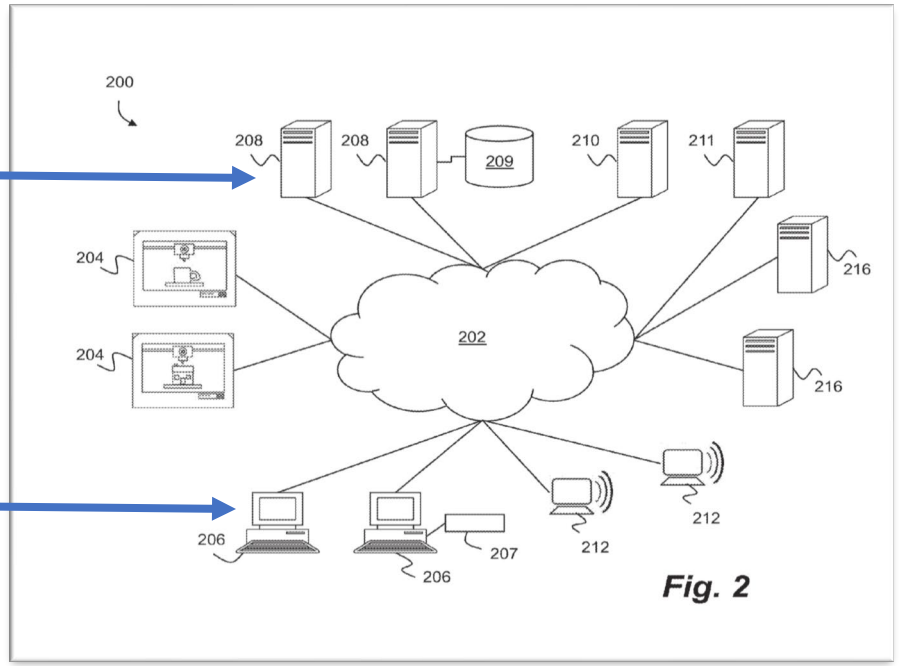


Fig. 2

The Challenged Claims are Patentable Under Ground 1A – Douglas-Mark Does Not Teach [1.2] / [1.3]

- The client device is a physical device, such as a desktop or laptop computer, and separate from the print server.
  - EX1005, ¶[0030].

[0030] Client devices **206** may be any devices within the environment **200** operated by users to initiate, manage, monitor, or otherwise interact with print jobs at the three-dimensional printers **204**. This may include desktop computers, laptop computers, network computers, tablets, or any other computing device that can participate in the environment **200** as contemplated herein. Each client device **206** generally

tion of remote three-dimensional printers **204**. The user interface may be maintained by a locally executing application on one of the client devices **206** that receives data and status information from, e.g., the printers **204** and print servers **208** concerning pending or executing print jobs. The user inter-

PO Sur-Reply, 6-7.

The Challenged Claims are Patentable Under Ground 1A – Douglas-Mark Does Not Teach [1.2] / [1.3]

- Petitioner's Reply also argues that a virtual workspace is a physical device or client device.
  - *See* Reply, 5.
- But Douglas is clear that the "virtual workspace" is provided by the print server. It is not the print server itself or the separate client device.
  - EX1005, ¶[0043].

[0043] In another aspect, a print server **208** may provide a virtual workspace for a user. In this virtual workspace, a user may search local or remote databases of printable objects, save objects of interest (or links thereto), manage pending prints, specify preferences for receiving status updates (e.g., by electronic mail or SMS text), manage subscriptions to content, search for new subscription sources, and so forth. In one aspect, the virtual workspace may be, or may include, web-based design tools or a web-based design interface that permits a user to create and modify models. In one aspect, the virtual workspace may be deployed on the web, while permitting direct fabrication of a model developed within that environment on a user-specified one of the three-dimensional printers **204**, thus enabling a web-based design environment that is directly coupled to one or more fabrication resources.

PO Sur-Reply, 6-7.

The Challenged Claims are Patentable Under Ground 1A – Douglas-Mark Does Not Teach [1.2] / [1.3]

- Petitioner says Douglas can select a printer on criteria that do not depend on tag data (proximity, capabilities, queue, fees).
  - Reply, 3-4.
- But a printer's location, capabilities, queue, and fees are all information from the printer, so evaluating them still requires querying **before** determining.

> Douglas makes clear that the receipt of a data tag is not a prerequisite for selecting a printer. For example, Douglas's print server automatically selects a target printer based "any number of criteria" including "geographical proximity, printing capabilities, current print queue, [and] fees." EX-1005, ¶[0032] (cited at Pet., 12; DI, 14). As noted in the Institution Decision, "[t]hese criteria do not necessarily

PO Sur-Reply, 6-7.

The Challenged Claims are Patentable Under Ground 1A – Douglas-Mark Does Not Teach [1.2] / [1.3]

- Petitioner acknowledges that the print server "periodically" queries the printers, further indicating that the target printer is queried before the "determining" step.
  - Reply, 4.

include, or depend on, the 3D printer's tag data." *Id.* Additionally, Douglas discloses that the print server "communicate[s] periodically with three-dimensional printers," indicating that the print server need not wait for the receipt of a data tag to allocate a print job to a printer. *Id.*; *see also* EX-1005, ¶[0049]. Finally, ¶[0074]

PO Sur-Reply, 6-7.

The Challenged Claims are Patentable Under Ground 1A

- Douglas-Mark fails to teach limitation [1.4] of independent claim 1.

1. A method comprising:
receiving a request to fabricate an object from a three-dimensional model;
determining a target printer to fabricate the object;
querying the target printer for configuration information of the target printer relevant to creation of a printable model for fabrication of the object on the target printer;
receiving, from the target printer, a dictionary of configuration information containing one or more properties from the target printer that affect fabrication capabilities of the target printer;
creating a fabrication profile based on the one or more properties; and generating a machine-ready representation of the three-dimensional model
executable by the target printer to fabricate the object.

EX1001, cl. 1

The Challenged Claims are Patentable Under Ground 1A – Douglas-Mark Does Not Teach [1.4]

- The Petition mapped Douglas's tag data to "a dictionary of configuration information" while relying on Douglas alone to teach claim [1.4].
  - Pet., 14-15.

[1.4]

The '774 patent describes "[t]he dictionary may be a list or collection of the properties, or may be otherwise configured to organize the properties of the printer." EX-1001, 21:24-26. Douglas' accumulated data tag 304 data received from the printer constitutes ***a dictionary of configuration information*** because it similarly includes a collection of "information on characteristics of the build material 312" ("***one or more properties***") which "may include at least one of a material identification number, a build material type, a build material diameter…a build material color…or other characteristic information." EX-1005, ¶¶[0062]-[0064]; EX-1003, ¶52.

Per [1.3], after an inquiry from the print server, Douglas' 3D printers transmit and the print server receives the "data tag 304 data" for "determination of the operational parameters…for fabrication of the object 314" ("***receiving, from the target printer, a dictionary of configuration information containing one or more properties from the target printer***"). EX-1005, ¶¶[0019], [0032], [0072]-[0073], [0097], FIGS.2, 6; *supra*, [1.3]. As discussed above, the data tag data includes "information on characteristics of the build material 312" ("***one or more properties from the target printer that affect fabrication capabilities of the target printer***") such as "a build material type" available to the printer, which would be needed to match the object to be printed. *Id.*; EX-1003, ¶53. The material type also affects "temperature," "feed rate," and "extruder movement speed" ("***fabrication capabilities***"), which, as Douglas notes, "depend upon the type of build material." *Id.*

POR, 17–19; Sur-Reply, 8; EX2014, ¶¶83-84.

The Challenged Claims are Patentable Under Ground 1A – Douglas-Mark Does Not Teach [1.4]

- Petitioner asserts Douglas's tag data is provided and received as a collection of configuration information.
  - Petitioner failed to explain why this data is a collection of configuration information
  - Douglas does not describe the organization of its tag data
  - Douglas does not teach how its data is provided or received by the print server

POR, 17–19; Sur-Reply, 8; EX2014, ¶¶83-84.

The Challenged Claims are Patentable Under Ground 1A – Douglas-Mark Does Not Teach [1.4]

- Dr. Hickner confirmed Douglas is silent on how the tag data is transmitted and thus received.
  - EX2015, 21:7-12

Q Does Douglas describe the format in which the information is provided and received?

A So Douglas is broad in that it doesn't talk about any specific file format or any -- well, way to -- method to transmit that information.

The Challenged Claims are Patentable Under Ground 1A – Douglas-Mark Does Not Teach [1.4]

- To the extent Petitioner relies on its expert to supply how Douglas's data is a transmitted as a "dictionary," that is improper.
- "Common sense" and expert opinion may not supply a missing limitation.
- An IPR may be requested only on the basis of patents or printed publications; expert testimony cannot take the place of a reference's disclosure.
  - 35 U.S.C. § 311(b)

> **(b) SCOPE.—**
> A petitioner in an inter partes review may request to cancel as unpatentable 1 or more claims of a patent only on a ground that could be raised under section 102 or 103 and only on the basis of prior art consisting of patents or printed publications.

  - Rule 104(b)(4)

> **(4)** How the construed claim is unpatentable under the statutory grounds identified in paragraph (b)(2) of this section. The petition must specify where each element of the claim is found in the prior art patents or printed publications relied upon; and

POR, 17–19; PO Sur-Reply, 8-9.

The Challenged Claims are Patentable Under Ground 1A – Douglas-Mark Does Not Teach [1.4]

- Petitioner cannot rely on "common sense as a wholesale substitute for analysis and evidence.
  - *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1361–62 (Fed. Cir. 2016).

> [7] Third, our cases repeatedly warn that references to "common sense"—whether to supply a motivation to combine or a missing limitation—cannot be used as a wholesale substitute for reasoned analysis and evidentiary support, especially when dealing with a limitation missing from the prior art references specified.

POR, 17–19.

The Challenged Claims are Patentable Under Ground 1A – Douglas-Mark Does Not Teach [1.4]

- Petitioner's new Reply theory that the data from Douglas's data tag is "read and transmitted as a collection" (citing EX1005, ¶¶85–87) was never discussed in the Petition for [1.4], nor were those paragraphs of Douglas cited.
  - Reply, 9.

> build material color…or other characteristic information.'"). Additionally, data from Douglas' data tag is read and transmitted as a collection. EX-1005, ¶¶[0085]-[0087] ("all the data…").

POR, 17–19; PO Sur-Reply, 9.

The Challenged Claims are Patentable Under Ground 1A

- Douglas-Mark fails to teach limitation [1.5] of independent claim 1.

1. A method comprising:
receiving a request to fabricate an object from a three-dimensional model;
determining a target printer to fabricate the object;
querying the target printer for configuration information of the target printer relevant to creation of a printable model for fabrication of the object on the target printer;
receiving, from the target printer, a dictionary of configuration information containing one or more properties from the target printer that affect fabrication capabilities of the target printer;
creating a fabrication profile based on the one or more properties; and generating a machine-ready representation of the three-dimensional model
executable by the target printer to fabricate the object.

EX1001, cl. 1

The Challenged Claims are Patentable Under Ground 1A – Douglas-Mark Does Not Teach [1.5]

- The Petition tacitly admits Douglas alone does not create a fabrication profile and falls back on obviousness rationales unsupported by either reference.
  - Pet., 19.

and feedrate). EX-1006, 11:33-65, 13:4-19, 17:53-58, FIGS. 5-7, 20 and 21. Accordingly, a POSITA would have recognized and found obvious to organize Douglas' operational parameters into a "profile" (e.g., in a more explicit form of a configuration file, a rule set or parameter database as taught by Mark) at least because organizing these parameters in such a data structure facilitates the use of these parameters for the generation of toolpaths/G-code, and provide better storage and computational efficiency, and allow easier rendering of such operational parameters for user view in a user interface as shown in Marks' FIGS.10, 20 and/or 21. EX-1005, ¶¶[0065]-[0066]; EX-1006, 11:33-65, 13:4-19, 17: 34-44, 53-58, FIGS.5-7, 9-10, 21-22; EX-1003, ¶¶58-59.

POR, 20-23.

The Challenged Claims are Patentable Under Ground 1A – Douglas-Mark Does Not Teach [1.5]

- But the cited paragraphs of Douglas and Mark say nothing about:
  - "better" transmission, storage, efficiency, or
  - user rendering.
  - *See, e.g.*, EX1005 ¶¶[0065]-[0066].

[0065] Once the supply **302** has been coupled to the coupling **308** and the tag sensor **310** has read the data tag **304** data, the data may be transmitted to the controller, which may be any of the controllers described herein, to determine at least one operational parameter for the three-dimensional printer **306** based on at least one characteristic of the build material **312** for the fabrication of an object **314**. For example, the operational parameter may be at least one of an extruder temperature, a feed rate, a build platform temperature, a build volume temperature, an infill requirement, a rafting requirement, a support structure requirement, a cooling requirement, or other operational parameter that might usefully be determined by the controller from the data stored by the data tag **304**.

[0066] In one embodiment, the controller may make the determination of operational parameters using only the data from the data tag **304**. For example, the data tag **304** may explicitly specify an extruder temperature and the controller may use the extruder temperature as an operational parameter, or the data tag **304** may identify a type of build material and the controller may calculate a suitable extruder temperature based on the type. Similarly, the controller may calculate other operational parameters such as build platform temperature, feed rate, cooling parameters, build chamber heating parameters, and so forth.

POR, 20-23.

The Challenged Claims are Patentable Under Ground 1A – Douglas-Mark Does Not Teach [1.5]

- Petitioner's expert did not analyze the supposed "better or more efficient data transmission."
  - EX2015, 27:3-8.

Does paragraph 73 of Douglas discuss better data transmission and printing efficiency?

A So I didn't analyze paragraph 73 in that context of "better" data transmission. I guess -- I didn't perform that analysis of better or more efficient data transmission.

The Challenged Claims are Patentable Under Ground 1A – No Profile Structure in Douglas

- Petitioner's expert never identified any structure in Douglas corresponding to a "fabrication profile."
- A "dictionary" requires more than unorganized configuration information, but Petitioner identifies no organization in Douglas.
  - EX2015, 22:9–13.

9 Q Yeah. In your declaration, you never
10 identify a specific structure labeled a
11 fabrication profile in Douglas; is that correct?
12 A **So I don't identify a specific file**
13 **format or a way to organize the data.**

The Challenged Claims are Patentable Under Ground 1A – Douglas Teaches Away from Mark

- Petitioner asserts that "code/instructions" for 3D printing are typically generated by a slicer and/or toolpath generator.
  - Pet., 9.

> Second, a POSITA would have recognized and found obvious that fabricating an object using a 3D printer would have used code/instructions executable on the 3D printer to control the 3D printer, and such code/instructions are typically generated by a slicer and/or toolpath generator. EX-1011, 34; EX-1003, ¶42. Mark discloses a suitable slicer and toolpath generator. EX-1006, 11:4-13:3; EX-1003, ¶42.

POR, 22–25. PO Sur-Reply, 9-11.

The Challenged Claims are Patentable Under Ground 1A – Douglas Teaches Away from Mark

- But Douglas sends operational parameters to the printer for the printer's use, not to a slicer to generate toolpaths.
  - EX1005, ¶[0073].
- There is thus no reason to "organize Douglas' operational parameters into a profile" to facilitate toolpath/G-code generation, and Douglas's printer decides how to fabricate from its parameters.

[0073] As a non-limiting example, a remote client device **206** may request an object **314** be printed on the network connected three-dimensional printer **306**. The three-dimensional printer **306** may have one or more supplies **302**, containing build material **312**, connected to one or more couplings **308**. The client device **206** may request the three-dimensional printer **306** to transmit the data tag **304** data for one or more of the connected supplies **302** for the determination of operational parameters for at least one of the connected supplies **302**. The client device **206** may select which of the one or more supplies **302** to use in fabricating the object **314**, determine the operational parameters for the selected supply **302**, and transmit the operational parameters back to the three-dimensional printer **306** for fabrication of the object **314**.

POR, 22–25. PO Sur-Reply, 9-11.

The Challenged Claims are Patentable Under Ground 1A – Douglas Teaches Away from Mark

- By contrast, Mark's printer only receives G-code; it is not involved in generating it and does not receive Douglas-style parameters.
  - EX1006, Fig. 5; *see also*, *id.* at Fig. 6; EX2014, ¶92
- Mark's rule/parameter database is therefore not a profile based on properties "from the target printer" that "affect[s] fabrication capabilities of the target printer."

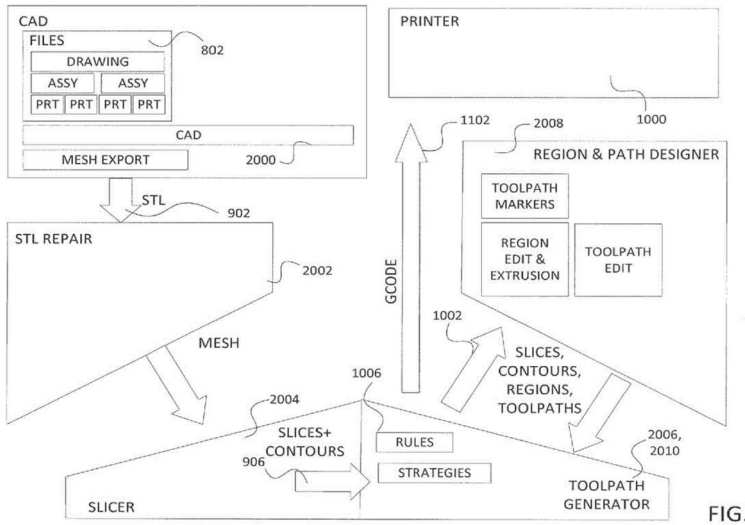


FIG. 5

The Challenged Claims are Patentable Under Ground 1A – Douglas Teaches Away from Mark

- Petitioner asserts that Douglas' parameters can combined with "print job information"
- This only confirms that Douglas teaches that *the printer* decides how to fabricate an object according to the operational parameters, as opposed to Mark, which does the opposite, *telling* the printer what to do.
  - Reply, 11.

> 10, 16-19; EX-1005, ¶[0073]; EX-1006, 17:34-44. Douglas itself explicitly describes that operational parameters determined by different sources "may be combined into a single set of operational parameters" and that they can be intermediate parameters that are "combined with…print job information." EX-1005, ¶¶[0074]-[0075]; *Rembrandt Diagnostics, LP v. Alere, Inc.*, 76 F.4th 1376,

POR, 22–25. PO Sur-Reply, 9-10; EX2014, ¶90.

The Challenged Claims are Patentable Under Ground 1A – Douglas Teaches Away from Mark

- Petitioner's Reply argument confirms "the Petition and Dr. Hickner" assumed a separate toolpath generator to generate instructions and ignored Douglas' teaching of sending the operational parameters to the printer.
  - Reply, 12.

> generation of toolpaths/G-code.'" POR, 22-23. But as the Petition and Dr. Hickner established, a POSITA would have known that "fabricating an object using a 3D printer would have used code/instructions…typically generated by a slicer and/or toolpath generator." Pet., 9 (citing EX-1003, ¶42). Patent Owner's own declarant

The Challenged Claims are Patentable Under Ground 1A – Douglas Teaches Away from Mark

- Because Douglas-Mark fails to teach claim 1, Ground 1A also fails as to claims 2-5, 9, 10, 12, 13, and 20.

Ground	Claims	Basis for Rejection (35 U.S.C. § 103)
1A	1-5, 9-10, 12-13, 20	Douglas and Mark
1B	6-7, 9-10	Douglas, Mark and Dahlin
1C	8	Douglas, Mark and Batchelder
1D	19	Douglas, Mark and Pax

The Challenged Claims are Patentable Under Ground 1B

Ground	Claims	Basis for Rejection (35 U.S.C. § 103)
1A	1-5, 9-10, 12-13, 20	Douglas and Mark
1B	6-7, 9-10	Douglas, Mark and Dahlin
1C	8	Douglas, Mark and Batchelder
1D	19	Douglas, Mark and Pax

Grounds 1B-1D Fail – Ground 1B

- Claim 6 requires creating a fabrication profile based on an automatically detected hardware reconfiguration.

1. A method comprising:

creating a fabrication profile based on the one or more properties; and generating a machine-ready representation of the three-dimensional model

4. The method of claim **1** wherein the one or more properties include a hardware configuration of the target printer.

6. The method of claim **4** wherein the hardware configuration includes an automatically detected hardware reconfiguration.

POR, 27–28.

Grounds 1B-1D Fail – Ground 1B

- The Petition asserts that it would have been obvious that "the data tag data received from the printer would include the automatically detected new or replacement material."
  - Pet., 33.

be extruded," etc. EX-1008, ¶[0022]. It would have been obvious to a POSITA that, in Douglas-Mark-Dahlin, the data tag data received from the printer would have included the automatically detected new or replacement material loaded on the spool because it is critical information reflects the current fabrication capability of the printer and is explicitly identified by Douglas as an example of a ***hardware configuration of the target printer*** per [4]. EX-1008, ¶¶[0022]-[0023]; EX-1005, ¶¶[0064], [0074]; EX-1003, ¶85.

POR, 27–28.

Grounds 1B-1D Fail – Ground 1B

- Dahlin only monitors a spool and pauses for **manual** replacement, rather teaching any automatic reconfiguration.
- Douglas and Mark do not cure Dahlin's deficiencies (*see* EX2014, ¶100)
- EX1008, ¶[0023]; *see also id.* at ¶[0022]

> ing the process. Also at the outset of a job, the CPU verifies that the modeling filament material on the spool is the same material specified in object data. If these materials are not the same, an operator notification is provided via touch screen display 21, providing the operator an opportunity to switch spools.

POR, 27–28; Sur-Reply, 12.

Grounds 1B-1D Fail – Ground 1B

- Petitioner's expert agrees.
  - EX2015, 63:8–14.

8 Q And does Dahlin ever describe creating
9 a fabrication profile based on that information?
10 A **So Dahlin discusses providing the**
11 **operator an opportunity to switch spools.** **And so,**
12 **I think that that is something that -- well, it**
13 **ensures that there's enough material or enough**
14 **build material type to complete the job.**

POR, 27–28.

Grounds 1B-1D Fail – Ground 1B

- Petitioner's Reply suggests that the properties in claim 6 are not the properties in claim 1
  - Reply, 15.

> Second, Patent Owner impermissibly reads features of claim 1 into claim 6 by alleging that the claimed "hardware reconfiguration" must additionally modify the fabrication profile ("creating or modifying [a] fabrication profile") and machine-ready representation ("regenerating print instructions"), rather than just the "one or more properties." POR, 27-28. Claim 1 does not require the fabrication profile to be created using each and every one of the "properties" of the dictionary, only that it is "based on…the one or more" of them. EX-1001, Claim 1. Moreover, there is no causal relationship between the "one or more properties" and the "machine-ready representation" in any of the intervening claims. *Id.*

PO Sur-Reply, 13.

Grounds 1B-1D Fail – Ground 1B

- Claims 6 depends from claim 4, which depends from claim 1
- Petitioner does not explain the distinction between "based on" and "using" — the Petition fails to show creating a fabrication profile based on an automatically detected hardware reconfiguration
- It is unclear why Petitioner believes there are multiple sets of properties between claims 1 and 6 to support creating a fabrication profile based on one property set that excludes the automatically detected hardware reconfiguration

1. A method comprising:
receiving a request to fabricate an object from a three-dimensional model;
determining a target printer to fabricate the object;
querying the target printer for configuration information of the target printer relevant to creation of a printable model for fabrication of the object on the target printer;
receiving, from the target printer, a dictionary of configuration information containing one or more properties from the target printer that affect fabrication capabilities of the target printer;
creating a fabrication profile based on the one or more properties; and generating a machine-ready representation of the three-dimensional model

PO Sur-Reply, 13.

Grounds 1B-1D Fail – Ground 1B

- Claim 7 requires a "manually specified" hardware reconfiguration.

4. The method of claim **1** wherein the one or more properties include a hardware configuration of the target printer.

5. The method of claim **4** wherein the hardware configuration includes one or more of an extruder type, an extruder nozzle diameter, a build volume, a build platform type, a hardware version number, a top speed for linear movement of a tool, a step size for movement of the tool, a minimum z-axis size, a gantry type, and a build material type.

6. The method of claim **4** wherein the hardware configuration includes an automatically detected hardware reconfiguration.

7. The method of claim **4** wherein the hardware configuration includes a manually specified hardware reconfiguration.

POR, 29–30; PO Sur-Reply, 13.

Grounds 1B-1D Fail – Ground 1B

- In Dahlin, the system specifies the matching material; the operator only performs the swap.
- Dahlin counsels that the user should not choose the filament, enforcing alignment with the material "specified in object data," and instead teaches manual performance of an automatically specified material to replace.
  - EX1008, ¶[0023].

> ing the process. Also at the outset of a job, the CPU verifies that the modeling filament material on the spool is the same material specified in object data. If these materials are not the same, an operator notification is provided via touch screen display 21, providing the operator an opportunity to switch spools.

POR, 29–30; PO Sur-Reply, 13.

Grounds 1B-1D Fail – Ground 1B

- In reply, Petitioner asserts that Patent Owner overlooks disclosure in Dahlin
- But Petitioner's Reply does not meaningfully address that Dahlin teaches automatically specified manual performance
  - Reply, 16; *see also* Reply, 17.

> (citing EX-1008, ¶[0023]. Patent Owner overlooks disclosure in Dahlin. *Id.* Dahlin at ¶[0022] discloses that "the operator can…grab ahold of the filament and extract it," explicitly disclosing that the operator replacing filament. EX-1008, ¶[0022] (cited at Pet., 33). Further, the Petition argued that it would have been obvious in view of Douglas-Mark-Dahlin that the user would have loaded material manually – Patent Owner criticizes only Dahlin alone. POR, 29-30.

POR, 29–30; PO Sur-Reply, 13.

The Challenged Claims are Patentable Under Ground 1C

Ground	Claims	Basis for Rejection (35 U.S.C. § 103)
1A	1-5, 9-10, 12-13, 20	Douglas and Mark
1B	6-7, 9-10	Douglas, Mark and Dahlin
1C	8	Douglas, Mark and Batchelder
1D	19	Douglas, Mark and Pax

Claim 8 is Patentable Under Ground 1C

- Claim 8 requires a firmware configuration.

> **8**. The method of claim **1** wherein the one or more properties include a firmware configuration of the target printer.

POR, 31-32.

Claim 8 is Patentable Under Ground 1C

- Petitioner relies on Batchelder's disclosure of "encoded markings" that may include "firmware updates." *See* EX1007, ¶[0054]; Pet. 35, 37
- A firmware **update** modifies the configuration and thus is not itself a firmware configuration.
  - EX2015, 66:11–15; *see also* EX2014, ¶110.

11	Q In your view, is a firmware update a
12	firmware configuration?
13	**A I mean, so I've updated firmware in my**
14	**own printers. And so, firmware updates are**
15	**updating the firmware configuration. I mean, the**
16	**way that this usually proceeds, and the way that**
17	**I've done it in my own lab, is that when you start**
18	**the printer and the software, there can be a**
19	**firmware check, and either the computer determines**
20	**that a firmware update needs to happen or there's**
21	**a published firmware update.**

POR, 31-32.

Claim 8 is Patentable Under Ground 1C

- Petitioner provides one example of how Batchelder in the combination would supply a firmware configuration -- encoded markings to indicate software and firmware to use with material. *See* Pet. at 37.
- Dr. Hickner admits this was an example he "just came up with."
  - EX2015, 69:2–11; *see also id.* at 68:14-69:1
- A reference that merely *could be* modified does not make a method obvious; Petitioner must show a POSITA *would have been* motivated to do so.

Q That example that you described, that's not actually described in Batchelder, though; is that correct?

A I mean, that's an example that I just came up with. I'd have to look and analyze the other examples that Batchelder talks about. But that was -- you know, based on my understanding of how this might work or a POSITA's understanding of how this might work, that might be one example where Batchelder could be used.

The Challenged Claims are Patentable Under Ground 1D

Ground	Claims	Basis for Rejection (35 U.S.C. § 103)
1A	1-5, 9-10, 12-13, 20	Douglas and Mark
1B	6-7, 9-10	Douglas, Mark and Dahlin
1C	8	Douglas, Mark and Batchelder
1D	19	Douglas, Mark and Pax

Claim 19 is Patentable Under Ground 1D

- Claim 19 requires generating descriptive metadata that specifies properties for comparison to printers.

> **19**. The method of claim **1** further comprising generating descriptive metadata to accompany the machine-ready representation, the descriptive metadata specifying one or more properties for comparison to properties of printers selected for fabricating the model.

POR, 33; PO Sur-Reply, 15.

Claim 19 is Patentable Under Ground 1D

- Pax describes predetermined values stored in computer memory rather than generated metadata for printer comparison.
  - EX1013, ¶[0097]; *see also id.* at ¶ [0098].

[0097] In step 1104, the color and material requirements for fabricating the object may be identified. For example, in step 1104 it may be determined that a particular object requires a first amount of green build material, a second amount of yellow build material, a third amount of cyan color additive, etc. The color and material requirements may be identified in several ways. In some implementations, these requirements may be identified from a "virtual fabrication," in which fabrication instructions are processed in memory of a computer, while totals of the various materials are tracked. In some implementations, the requirements may be determined from the object model using standard geometric computations. In some implementations, the requirements may be contained in metadata of the object model, fabrication instructions, or a related file.

POR, 33; PO Sur-Reply, 15.

Grounds 1B-1D Fail – Ground 1D

- Douglas's "metadata concerning print jobs" is also not shown to be generated or to specify properties for comparison.
  - Pet., 40.

> Douglas discloses its generated "print queue" includes "***metadata*** concerning print jobs" ***accompanying*** "print data" that includes "tool instructions to fabricate an object" ("***machine-ready representation***"). EX-1005, ¶¶[0040]-[0041]; EX-1003, ¶102.

POR, 33; PO Sur-Reply, 15.

Overview of Argument

I. Overview of the '774 Patent

II. Overview of the Purported Prior Art

III. The Challenged Claims are Patentable Under Ground 1A

IV. The Challenged Claims are Patentable Under Ground 1B

V. The Challenged Claims are Patentable Under Ground 1C

VI. The Challenged Claims are Patentable Under Ground 1D

VII. Evans and KISSlicer are not Printed Publications

VIII. The Challenged Claims are Patentable Under Ground 2A

IX. The Challenged Claims are Patentable Under Grounds 2B-2E

Evans and KISSlicer are not Printed Publications

- Petitioner asserts Evans (EX1011) and KISSlicer (EX1012) were published in 2012.
- But the Petition provides no further support for these dates.

Reference	Priority Date	Publication Date
Douglas	Oct.-29-2012	May-1-2014
Mark	Mar.-22-2013	Jul.-4-2017
Dahlin	Jan.-26-1998	Jun.-18-2008
Batchelder	Nov.-19-2009	May-8-2014
Hamilton	Apr.-16-2014	Aug.-21-2014
Evans	-	2012
KISSlicer	-	Jan.-2012
Pax	Sep.-7-2012	Mar.-13-2014
Pettis	Jun.-8-2012	Dec.-12-2013
Wang	Aug.-29-2014	Jan.-9-2018

Evans and KISSlicer are not Printed Publications

- Grounds 2A-2E therefore fail at least because Evans and KISSlicer are not printed publications

	Ground	Claims	Basis for Rejection (35 U.S.C. § 103)
	1A	1-5, 9-10, 12-13, 20	Douglas and Mark
	1B	6-7, 9-10	Douglas, Mark and Dahlin
	1C	8	Douglas, Mark and Batchelder
	1D	19	Douglas, Mark and Pax
X	2A	1-5, 9-10, 12-13	Hamilton and Evans (with/without KISSlicer)
X	2B	6-7, 19	Hamilton, Evans and Pax (with/without KISSlicer)
X	2C	19	Hamilton, Evans, Pax, and Pettis (with/without KISSlicer)
X	2D	8	Hamilton, Evans and Batchelder (with/without KISSlicer)

	Ground	Claims	Basis for Rejection (35 U.S.C. § 103)
X	2E	20	Hamilton, Evans and Wang (with/without KISSlicer)

Evans and KISSlicer are not Printed Publications

- The Petition does not identify any subsection of 35 U.S.C. § 102 under which Evans and KISSlicer qualify.
- It is Petitioner's burden to identify, with particularity, the evidence supporting each ground.
  - 35 U.S.C. § 312(a)(3)

> **(a) REQUIREMENTS OF PETITION.**—A petition filed under section 311 may be considered only if—
>
> **(1)** the petition is accompanied by payment of the fee established by the Director under section 311;
>
> **(2)** the petition identifies all real parties in interest;
>
> **(3)** the petition identifies, in writing and with particularity, each claim challenged, the grounds on which the challenge to each claim is based, and the evidence that supports the grounds for the challenge to each claim, including—

POR, 35-49; PO Sur-Reply, 1-3.

Evans and KISSlicer are not Printed Publications

- 37 C.F.R. ¶ 42.22(a)

§ 42.22 Content of petitions and motions.

(a) Each petition or motion must be filed as a separate paper and must include:

(1) A statement of the precise relief requested; and

(2) A full statement of the reasons for the relief requested, including a detailed explanation of the significance of the evidence including material facts, and the governing law, rules, and precedent.

POR, 35-49; PO Sur-Reply, 1-3.

Evans and KISSlicer are not Printed Publications

- *United States v. Dunkel*, 927 F.2d 955, 956 (7th Cir. 1991).

[1, 2] The government contends that Dunkel's conviction is not affected by *Cheek*. First, the prosecutor contends, Dunkel waived any objection to the district court's ruling by burying it in a single unreasoned paragraph of his brief on appeal. A skeletal "argument", really nothing more than an assertion, does not preserve a claim. *United States v. Giovannetti*, 919 F.2d 1223, 1230 (7th Cir.1990). Especially not when the brief presents a passel of other arguments, as Dunkel's did. Judges are not like pigs, hunting for truffles buried in briefs. But claims of waiver may themselves be waived, *Wilson v. O'Leary*, 895 F.2d 378, 384 (7th Cir.1990), and the United States did just that—not in this court, but in the Supreme Court of the United States.

POR, 35-49; PO Sur-Reply, 1-3.

Evans and KISSlicer are not Printed Publications

- The Board's rules prohibit incorporation of arguments by reference.
  - 37 C.F.R. § 42.6(a)(3).

> **(3) *Incorporation by reference; combined documents.*** Arguments must not be incorporated by reference from one document into another document. Combined motions, oppositions, replies, or other combined documents are not permitted.

POR, 38.

Evans and KISSlicer are not Printed Publications

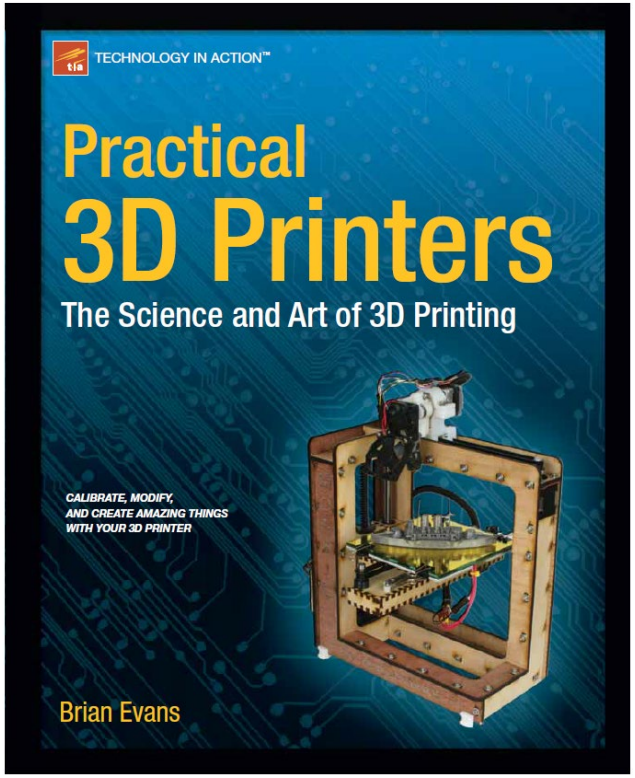
- It is not Patent Owner's, or the Board's, job to piece together why Petitioner believes the references are prior art.
- *TCL Commc'n Tech. Holdings Ltd. v. DataQuill Ltd.*, IPR2020-00746, Paper 21 at 22 (PTAB Sept. 18, 2020).

> It is Petitioner's responsibility to cite specific evidence to support its arguments, not the Board's responsibility to piece together evidence or speculate as to Petitioner's position. Petitioner has not adequately done so here. By way of further explanation, we provide several examples below as

POR. 36.

Evans and KISSlicer are not Printed Publications - Evans

- Evans (EX1011) is not a printed publication.



Reference	Priority Date	Publication Date
Douglas	Oct.-29-2012	May-1-2014
Mark	Mar.-22-2013	Jul.-4-2017
Dahlin	Jan.-26-1998	Jun.-18-2008
Batchelder	Nov.-19-2009	May-8-2014
Hamilton	Apr.-16-2014	Aug.-21-2014
Evans	-	2012
KISSlicer	-	Jan.-2012
Pax	Sep.-7-2012	Mar.-13-2014
Pettis	Jun.-8-2012	Dec.-12-2013
Wang	Aug.-29-2014	Jan.-9-2018

Evans and KISSlicer are not Printed Publications - Evans

- Petitioner's Reply improperly relies on EX1016, a declaration never mentioned in the Petition.
  - Reply, 25.

> Evans is prior art. As noted in the Institution Decision, "[t]he declaratory evidence of record appears to show that Evans was published on October 4, 2012…[and] also includes ISBN-13 numbers and a copyright date of 2012." DI, 23 (citing EX-1016 – a librarian detailing how Evans was cataloged in Penn State's library in 2012). But also, Evans indicates that it was "[d]istributed to the book trade

POR, 38.

Evans and KISSlicer are not Printed Publications - Evans

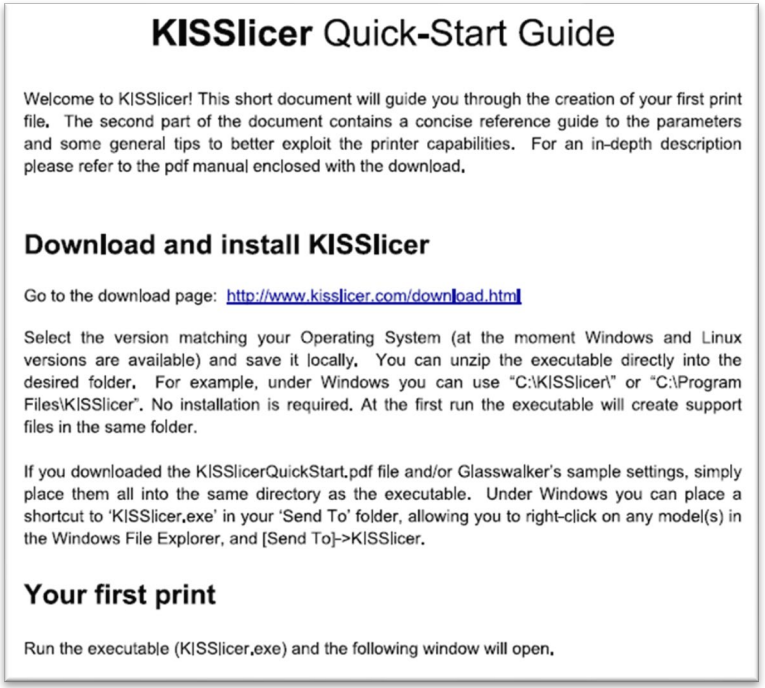
- Petitioner never showed that Evans was disseminated or otherwise made available to persons of ordinary skill exercising reasonable diligence
- Attorney argument that "books" are made to be disseminated to interested persons is not evidence
  - Reply, 23-24.

> Indeed, as acknowledged in the Institution Decision, Evans and KISSlicer are prior art to the '774 patent based on information readily apparent from the references themselves. ID, 23; EX-1011 (copyright date, ISBN, and Springer publishing); EX-1012 (archive.org date). Evans is a book. EX-1011, 1. Books are made to be disseminated to interested persons. KISSlicer's first page explains that it is guide

POR. 36; PO Sur-Reply, 3.

Evans and KISSlicer are not Printed Publications - KISSlicer

- KISSlicer is not a printed publication.



KISSlicer Quick-Start Guide

Welcome to KISSlicer! This short document will guide you through the creation of your first print file. The second part of the document contains a concise reference guide to the parameters and some general tips to better exploit the printer capabilities. For an in-depth description please refer to the pdf manual enclosed with the download.

Download and install KISSlicer

Go to the download page: http://www.kisslicer.com/download.html

Select the version matching your Operating System (at the moment Windows and Linux versions are available) and save it locally. You can unzip the executable directly into the desired folder. For example, under Windows you can use "C:\KISSlicer\" or "C:\Program Files\KISSlicer". No installation is required. At the first run the executable will create support files in the same folder.

If you downloaded the KISSlicerQuickStart.pdf file and/or Glasswalker's sample settings, simply place them all into the same directory as the executable. Under Windows you can place a shortcut to 'KISSlicer.exe' in your 'Send To' folder, allowing you to right-click on any model(s) in the Windows File Explorer, and [Send To]->KISSlicer.

Your first print

Run the executable (KISSlicer.exe) and the following window will open.

Reference	Priority Date	Publication Date
Douglas	Oct.-29-2012	May-1-2014
Mark	Mar.-22-2013	Jul.-4-2017
Dahlin	Jan.-26-1998	Jun.-18-2008
Batchelder	Nov.-19-2009	May-8-2014
Hamilton	Apr.-16-2014	Aug.-21-2014
Evans	-	2012
KISSlicer	-	Jan.-2012
Pax	Sep.-7-2012	Mar.-13-2014
Pettis	Jun.-8-2012	Dec.-12-2013
Wang	Aug.-29-2014	Jan.-9-2018

Evans and KISSlicer are not Printed Publications – KISSlicer

- The Petition only has one passing reference to the EX1015 declaration
- The Petition "failed to state its relevance" for establishing whether KISSlicer is a printed publication. 37 C.F.R. ¶42.104(b)(5).
  - Pet., 59.

> Additionally, it was well known before the Critical Date for slicing applications to generate settings/configurations based on printer capabilities. EX-1003, ¶124. For example, another publicly available slicing application, "KISSlicer," creates "profiles" for each print that are based on printer capabilities, for example, the printer's available materials. EX-1012, 3-11; EX-1015; EX-1003, ¶124. An example KISSlicer profile is illustrated below.

POR, 38.

Evans and KISSlicer are not Printed Publications - KISSlicer

- Petitioner never showed that KISSlicer was disseminated or otherwise made available to persons of ordinary skill exercising reasonable diligence.
- Attorney argument about "freely downloadable software" is not evidence.
- KISSlicer (EX1012) is a quick start guide, not software.
  - Reply, 23-24.

> disseminated to interested persons. KISSlicer's first page explains that it is guide for a freely downloadable software. EX-1012, 1. Again, it was made for dissemination to interested persons. Patent Owner not only fails to engage on this readily evident information, it even fails to engage on the observations discussed in the Institution Decision.

POR. 36; PO Sur-Reply, 3.

Evans and KISSlicer are not Printed Publications

- Grounds 2A–2E each rely on Evans and/or KISSlicer and therefore fail.

	Ground	Claims	Basis for Rejection (35 U.S.C. § 103)
	1A	1-5, 9-10, 12-13, 20	Douglas and Mark
	1B	6-7, 9-10	Douglas, Mark and Dahlin
	1C	8	Douglas, Mark and Batchelder
	1D	19	Douglas, Mark and Pax
X	2A	1-5, 9-10, 12-13	Hamilton and Evans (with/without KISSlicer)
X	2B	6-7, 19	Hamilton, Evans and Pax (with/without KISSlicer)
X	2C	19	Hamilton, Evans, Pax, and Pettis (with/without KISSlicer)
X	2D	8	Hamilton, Evans and Batchelder (with/without KISSlicer)

	Ground	Claims	Basis for Rejection (35 U.S.C. § 103)
X	2E	20	Hamilton, Evans and Wang (with/without KISSlicer)

Pet., 1; POR, 35-39; PO Sur-Reply, 3.

The Challenged Claims are Patentable Under Ground 2A

- Ground 2A (Hamilton + Evans, with or without KISSlicer) challenges claims 1–5, 9, 10, 12, and 13.

2A	1-5, 9-10, 12-13	Hamilton and Evans (with/without KISSlicer)
2B	6-7, 19	Hamilton, Evans and Pax (with/without KISSlicer)
2C	19	Hamilton, Evans, Pax, and Pettis (with/without KISSlicer)
2D	8	Hamilton, Evans and Batchelder (with/without KISSlicer)

The Challenged Claims are Patentable Under Ground 2A

- Hamilton-Evans fails to teach elements [1.1], [1.2]/[1.3], [1.4], [1.5], and [1.6] of independent claim 1.
- Evans and KISSlicer are not printed publications so this entire set of grounds fails on that basis too.

1. A method comprising:
receiving a request to fabricate an object from a three-dimensional model;
determining a target printer to fabricate the object;
querying the target printer for configuration information of the target printer relevant to creation of a printable model for fabrication of the object on the target printer;
receiving, from the target printer, a dictionary of configuration information containing one or more properties from the target printer that affect fabrication capabilities of the target printer;
creating a fabrication profile based on the one or more properties; and generating a machine-ready representation of the three-dimensional model
executable by the target printer to fabricate the object.

The Challenged Claims are Patentable Under Ground 2A

- Hamilton-Evans fails to teach limitation [1.1] of independent claim 1.

1. A method comprising:
receiving a request to fabricate an object from a three-dimensional model;
determining a target printer to fabricate the object;
querying the target printer for configuration information of the target printer relevant to creation of a printable model for fabrication of the object on the target printer;
receiving, from the target printer, a dictionary of configuration information containing one or more properties from the target printer that affect fabrication capabilities of the target printer;
creating a fabrication profile based on the one or more properties; and generating a machine-ready representation of the three-dimensional model
executable by the target printer to fabricate the object.

The Challenged Claims are Patentable Under Ground 2A - Hamilton Does Not Teach [1.1]

- Petition relies on Hamilton for claim limitation [1.1]. *See* Pet. 51-53.
- Hamilton already includes instructions in its designs.
  They do not start with a model that is sliced into instructions.
  - EX1010, ¶[0019].

puter system. The information mentioned above consists of, but is not limited to, information on the accuracy of the printer, materials the printer is able to use, materials currently in the printer, and information on payment for the design. The Designs for the printer will consist of the necessary printer requirements for the design, information on the materials required, instructions for the 3D printer, separately numbered individual parts, and instructions for assembly of the product for the user. If the requirements found in the design are met by the printer, the user is allowed to purchase the design. If the requirements in the design are not met by the printer the user will not be allowed to purchase the design.

POR, 39-40; *see also* EX2014, ¶¶120-121.

The Challenged Claims are Patentable Under Ground 2A - Hamilton Does Not Teach [1.1]

- Dr. Cormier's testimony that printing processes typically began with a model and use slicers was not about Hamilton, which breaks from that convention.
  - *See, e.g.*, EX1043 59:1-13.

Q. Is that like a -- a translation step?
A. Yes. It's a step that -- so the sliced file that you would send to the printer for execution on the printer is -- well, almost all 3D printers print one layer of material on top of another.
And so the term "slice" refers to generating the printing instructions to produce each of those individual layers in sequence. And so that's the process of what a slicer does.
Q. And is that something that is specific to the J750?
A. No. 3D printers, in general, use slicers to prepare the files for printing.

POR 39-40.

The Challenged Claims are Patentable Under Ground 2A - Hamilton Does Not Teach [1.1]

- Slicer converts a model into printer instructions
- But Hamilton discloses no slicing and no G-code (example of slicing output), and ships printer instructions with its designs.
  - EX2015, 50:13-21; 53:13-17.

13 Q And does Hamilton describe running a
14 slicer at any point?
15 A So Hamilton does not specifically
16 discuss slicers, but in order to print a
17 3D-printed part, a POSITA understands that a
18 slicer would have to be involved, or a POSITA
19 would be motivated to use a slicer in order to
20 print that part; otherwise, you can't generate
21 instructions for printing.

13 Q To clarify, you're saying that a POSITA
14 would have been motivated to, then, generate the G
15 code, but Hamilton doesn't actually instruct the
16 POSITA to do so?
17 A Hamilton does not talk about G code.

POR, 39-40; PO Sur-Reply, 16

The Challenged Claims are Patentable Under Ground 2A

- Hamilton-Evans fails to teach limitations [1.2]/[1.3] of independent claim 1.

1. A method comprising:
receiving a request to fabricate an object from a three-dimensional model;
determining a target printer to fabricate the object;
querying the target printer for configuration information of the target printer relevant to creation of a printable model for fabrication of the object on the target printer;
receiving, from the target printer, a dictionary of configuration information containing one or more properties from the target printer that affect fabrication capabilities of the target printer;
creating a fabrication profile based on the one or more properties; and generating a machine-ready representation of the three-dimensional model
executable by the target printer to fabricate the object.

The Challenged Claims are Patentable Under Ground 2A - Hamilton Queries First [1.2]/[1.3]

- Petition relies on Hamilton for claim limitations [1.2] / [1.3]. *See* Pet. 54-55.
- Hamilton's process flow:
  - queries the printer (Fig. 3, step 320),
  - receives a response (step 330), and
  - then compares to design requirements (step 340).
- EX1010, ¶[0021]; *see also id.* at ¶[0020], Figs. 2-3.
- The same ordering claim construction that defeats Ground 1A applies here.

[0021] Turning to FIG. **3**, a block diagram of the process in which a product is printed from the design supplier's side. The system will wait until a request for a design is made **310**. Once a design is requested, the system will access the design for the design requirements **320**. Using these design requirements the system will query the user's 3D printer for its accuracy and material abilities **330**. The system will wait for a response from the printer **330**. The user's 3D printer will then respond with its accuracy and material capabilities. The system will then compare the capabilities of the printer to the requirements of the design. If the design's requirements are not met by the user's 3D printer the system will send a no purchase message and not design is sent **390**. If the requirements are met by the user's 3D printer then the system will proceed to ask the user to provide payment for the design **360**. If payment is not received a no purchase message is sent and no design is sent and the system returns to waiting for a design request **390**. If payment is received then a design is sent and the system returns to waiting for a design request **380**.

POR, 40–43.

The Challenged Claims are Patentable Under Ground 2A - Hamilton's User Does Not Pick a Target Printer

- Petitioner says the "attached printer" is the "target printer to fabricate the object" because the system waits for the user to confirm the printer is attached and ready.
  - Pet., 54.

the model is sent to the user's 3D printer to fabricate the model. *Id.* A POSITA would have recognized that "the user's 3D printer" would be "***a target printer to fabricate the object***" because the user first requests a product 210 and the system waits for a response from the user to ensure that the printer is attached and ready. EX-1010, ¶[0020]. The attached printer would have been the target printer and would have been determined before "query[ing] the user's 3D printer for its accuracy and material abilities 330" EX-1010, ¶¶[0019]-[0021]; EX-1003, ¶118. Furthermore, Hamilton's query is evidence that its system is also determining the target printer in that it could reject the user's 3D printer if its abilities were insufficient. *Id.*

POR, 40–43; PO Sur-Reply, 16–17.

The Challenged Claims are Patentable Under Ground 2A - Hamilton's User Does Not Pick a Target Printer

- When the user confirms the printer is attached and ready, all the user knows is the "product," not the object to be fabricated by a printer.
- Hamilton's system (not the user) accesses the design that identifies parts/object
  - EX1010, ¶¶[0019]-[0020]; *see also* Figs. 2, 5.

[0020] Turning to FIG. **2**, a block diagram of the process in which a product is printed from the user's side. The user first request's a product **210**. The system then waits for a response from the user to ensure that the printer is attached and ready. The system then will access the design for the requirements to print the product **230**. When the design requirements are [illegible] responds, to the user the material needed and the [illegible] the printer needed **240**. The system will then wait [illegible]se from the user of the material available **250**. If [illegible] available matches the design requirements **260** [illegible]uracy of the printer is correct it then proceeds to [illegible]er to provide payment for the design **270**. When [illegible]eceived the system responds with sending **280** the [illegible]e user allowing them to print the product **290**.

EX1010, ¶[0019]

in the printer, and information on payment for the design. The Designs for the printer will consist of the necessary printer requirements for the design, information on the materials required, instructions for the 3D printer, separately numbered individual parts, and instructions for assembly of the product for the user. If the requirements found in the design are met by the printer, the user is allowed to purchase the design. If the requirements in the design are not met by the printer the user will not be allowed to purchase the design.

POR, 40–43; PO Sur-Reply, 16–17.

The Challenged Claims are Patentable Under Ground 2A - Hamilton's User Does Not Pick a Target Printer

- Thus, the user does not yet know the design, its material requirements, the accuracy needed, or the parts/object to fabricate.
- The printer in Hamilton is not a target printer to fabricate the object until the print material is okay at step 260, which requires matching those requirements.
  - EX1010 ¶[0020].

accuracy of the printer needed **240**. The system will then wait for a response from the user of the material available **250**. If the material available matches the design requirements **260** and the accuracy of the printer is correct it then proceeds to allow the user to provide payment for the design **270**. When payment is received the system responds with sending **280** the designs to the user allowing them to print the product **290**.

POR, 40–43; PO Sur-Reply, 16–17.

The Challenged Claims are Patentable Under Ground 2A

- Hamilton-Evans fails to teach limitation [1.4] of independent claim 1.

1. A method comprising:
receiving a request to fabricate an object from a three-dimensional model;
determining a target printer to fabricate the object;
querying the target printer for configuration information of the target printer relevant to creation of a printable model for fabrication of the object on the target printer;
receiving, from the target printer, a dictionary of configuration information containing one or more properties from the target printer that affect fabrication capabilities of the target printer;
creating a fabrication profile based on the one or more properties; and generating a machine-ready representation of the three-dimensional model
executable by the target printer to fabricate the object.

The Challenged Claims are Patentable Under Ground 2A – No "Dictionary" From the Printer [1.4]

- Hamilton does not specify the organization of its accuracy and material capabilities or how they are sent or received.
  - EX1010 ¶[0021].

[0021] Turning to FIG. **3**, a block diagram of the process in which a product is printed from the design supplier's side. The system will wait until a request for a design is made **310**. Once a design is requested, the system will access the design for the design requirements **320**. Using these design requirements the system will query the user's 3D printer for its accuracy and material abilities **330**. The system will wait for a response from the printer **330**. The user's 3D printer will then respond with its accuracy and material capabilities. The system will then compare the capabilities of the printer to the requirements of the design. If the design's requirements are not met by the user's 3D printer the system will send a no purchase message and not design is sent **390**. If the requirements are met by the user's 3D printer then the system will proceed to ask the user to provide payment for the design **360**. If payment is not received a no purchase message is sent and no design is sent and the system returns to waiting for a design request **390**. If payment is received then a design is sent and the system returns to waiting for a design request **380**.

POR, 45-47.

The Challenged Claims are Patentable Under Ground 2A – No "Dictionary" From the Printer [1.4]

- Petitioner's expert conceded the manner of transmission is unspecified.
  - EX2015, 55:7-18

7 Q But it doesn't say whether or not those
8 accuracy and material capabilities are combined
9 and then sent as a collection; is that correct?
10 A I mean, it just says the user's 3D
11 printer will, then, respond with its accuracy and
12 material capabilities. I think a POSITA would
13 understand that that can happen in any sort of
14 reasonable data transmission format. Again, a
15 file type or protocol is not specified here, but
16 it does say accuracy and material capabilities.
17 And so, that implies that that information is all
18 sent in some sort of unspecified manner.

POR, 45-47.

The Challenged Claims are Patentable Under Ground 2A – Evans's Parameters are User Entered

- In addition to Hamilton, Petitioner relies on Evans for "additional information" (nozzle size, filament diameter, layer height).
  - Pet., 56-57.

Similar to Hamilton's target printer's "accuracy and material capabilities," Evans also discloses "information about your printer and filament" ("***configuration information***" that "***affect[s] fabrication capabilities of the target printer***") "such as filament diameter," "extruder nozzle size," and "layer height" is needed in order for the slicer to generate sliced layers for 3D printing. EX-1011, 43-46, 312. A POSITA would have recognized and found obvious that Hamilton's target printer's "accuracy and material capabilities" would include additional information as disclosed by Evans because such information is needed and beneficial for the slicer application to generate codes that control the 3D printer to print the design. EX-1011, 43-46, 62; *supra*, §III-D-3; EX-1003, ¶122.

POR, 45-47.

The Challenged Claims are Patentable Under Ground 2A – Evans's Parameters are User Entered

- Hamilton-Evans combination in Petition is based on adding Evans' additional information to Hamilton's printer accuracy and capabilities transmitted from the printer.
  - Pet., 44-45

3. Hamilton and Evans combination

A POSITA would have been motivated to implement Hamilton's system employing Evans' slicer configured to process (e.g., slice) a 3D model into layers and generate toolpath instructions (e.g., G-code) according to a configuration profile created based on properties that reflect the fabrication capability of the 3D printer and used for the generation of the G-code, and configured to transmit the G-code to the 3D printer for execution, includes Evans' additional examples of printer and filament properties (including user settings on the printer) in the "printer accuracy and capabilities" transmitted from the printer for the selection of a suitable printer to fabricate an object, and Evans' explicit teaching on user's selection and replacement of material in the 3D printer. *See e.g.*, EX-1010, ¶¶[0016]-[0019], [0021], FIG.3; EX-1011, 25-28, 43-46, 62. A POSITA would

POR, 46-47.

The Challenged Claims are Patentable Under Ground 2A – Evans's Parameters are User Entered

- Evans teaches that a user manually inputs these parameters
- Evans manually measures and enters those values, such as filament diameter below, so the parameters are not automatically created or received from the printer.
  - EX1011, 68; *see also id.* at 66-67.



Figure 3-15. *Measuring filament diameter*

POR, 45-47.

The Challenged Claims are Patentable Under Ground 2A – Evans's Parameters are User Entered

- Evans teaches that nozzle size and layer height (the other parameters identified by Petitioner) are also manually input.
  - EX1011, 67

> While the print settings are the most important settings that we will most likely use on a print-by-print basis, we also need to tell our slicer application a little about our printer and filament. The first item on the agenda is our printer's nozzle size. MakerGear hotends (see Figure 3-14) generally ship with 0.35mm nozzles, while the MakerBot extruders most often use 0.4mm nozzles.

> The slicer utility uses this information to calculate the die swell of the extruded filament, or the expected diameter of the extruded plastic, as it exits the nozzle. This can then be used to determine the layer width compared to the specified layer height to easily generate exact toolpaths where the strands of extruded filament properly fill the layer shape, fusing to neighboring strands to make a solid infill.

POR, 45-47.

The Challenged Claims are Patentable Under Ground 2A – Evans's Parameters are User Entered

- Petitioner's expert explained that Evans doesn't describe those settings being sent by the printer.
  - EX2015, 58:16-22

16 Q So Evans doesn't describe those
17 settings being sent by the printer; is that
18 correct?
19 A In these specific passages, Evans
20 doesn't talk about things being sent by the
21 printer. He's talking about more of a manual
22 operation in order for a user to get more familiar

POR, 45-47.

The Challenged Claims are Patentable Under Ground 2A – Evans's Parameters are User Entered

- Petitioner's Reply does not meaningfully dispute that there is no support for the rationale that adds Evans' "additional information" to Hamilton's accuracy and material capabilities.
  - Sur-Reply, 18

> Similar to Ground 1A, Petitioner asserts that Patent Owner is narrowly interpreting the term "dictionary" and that the combination teaches the claim limitation. Reply, 20. However, it is undisputed that "there is no support for the rationale that adds Evan's 'additional information' to Hamilton's accuracy and material capabilities." POR, 47 (citing EX2014, ¶128); *see also id.*, 45-46. Thus, Petitioner's reliance on the combination is deficient, like the references themselves.

POR, 46-47

The Challenged Claims are Patentable Under Ground 2A

- Douglas-Mark fails to teach limitation [1.5] of independent claim 1.

1. A method comprising:
receiving a request to fabricate an object from a three-dimensional model;
determining a target printer to fabricate the object;
querying the target printer for configuration information of the target printer relevant to creation of a printable model for fabrication of the object on the target printer;
receiving, from the target printer, a dictionary of configuration information containing one or more properties from the target printer that affect fabrication capabilities of the target printer;
creating a fabrication profile based on the one or more properties; and generating a machine-ready representation of the three-dimensional model
executable by the target printer to fabricate the object.

Pet., 1.

The Challenged Claims are Patentable Under Ground 2A – No Fabrication Profile [1.5]

- The Petition argued that the combination teaches a slicer to create a fabrication profile upon receiving printer properties.
  - Pet., 57-58.

> ***more properties***"). EX-1011, 43-46; EX-1003, ¶123. A POSITA would have

> understood and found obvious that, in Hamilton-Evans, upon receiving the printer properties from the printer (e.g., Hamilton's "accuracy and material capabilities" and Evan's "information about your printer and filament"), the slicer would have created a fabrication profile such as an example "configuration" of Slic3r shown in Evan's FIG. 2-11, which is created based on the properties such as "Print Settings" and "Printer and Filament" properties. *Id.*; EX-1010,

POR, 47-49; PO Sur-Reply, 19.

The Challenged Claims are Patentable Under Ground 2A – No Fabrication Profile [1.5]

- Hamilton's designs already include "instructions for the 3D printer," sent only after the supplier confirms the printer meets the design requirements.
  - EX1010, ¶[0019]; *see also id.* at ¶[0022].

> in the printer, and information on payment for the design. The Designs for the printer will consist of the necessary printer requirements for the design, information on the materials required, instructions for the 3D printer, separately numbered individual parts, and instructions for assembly of the product for the user. If the requirements found in the design are met by the printer, the user is allowed to purchase the design. If the requirements in the design are not met by the printer the user will not be allowed to purchase the design.

POR, 47-49; PO Sur-Reply, 19.

The Challenged Claims are Patentable Under Ground 2A – No Fabrication Profile [1.5]

- Petitioner now faults Patent Owner for not addressing multiple slicer applications, but Petitioner merely provides attorney argument.
  - Reply, 21.

nozzle and filament diameters." POR, 48-49 (citing EX-1011, 66-68). Patent Owner's cited disclosure of Evans is only one example of many slicers described in the reference, and indeed, is distinct from Petitioner's cited example "Slic3r," which automatically determines print settings. EX-1011, 46 (cited at Pet., 57). Further,

POR 47-49; PO Sur-Reply, 20.

The Challenged Claims are Patentable Under Ground 2A – No Fabrication Profile [1.5]

- Further, this attorney argument that Slic3r "automatically determines print settings" conflicts with the disclosure of Evans
- Evans discloses that Slic3r's desired "print settings" are manually input into the slicer instead of being received from the printer
  - *See* EX1011, 46 (cited in Reply, 21).

> Slic3r is quickly becoming one of the more popular slicers because of its ease of use, blistering slicing times, and remarkable print quality. It previously lacked some of the features that the more mature slicers have, but with the addition of cooling and support material, it has addressed many of its faults. Where Skeinforge asks users to make a lot of calculations regarding the filament extrusion, Slic3r calculates all of these values under the hood after inputting only a few parameters about your printer, the filament, and the desired print settings. While I have personally used just about every slicing application out there, Slic3r has become the only one I use to slice 3D models because it is so easy to use and for its consistent high-quality results.

POR 47-49; PO Sur-Reply, 20.

The Challenged Claims are Patentable Under Ground 2A – No Fabrication Profile [1.5]

- Petitioner fails to illustrate how Hamilton obviates the need for user-entered inputs into the slicer
- For example, there is no evidence of avoiding measurement and input of nozzle diameter and filament diameter as Evans teaches
- Again, Petitioner's Reply does not meaningfully dispute that there is no support for the rationale that adds Evans' "additional information" to Hamilton's accuracy and material capabilities and thus Evans' information would not have been sent from the target printer in the combination
  - Reply, 21.

> automatically determines print settings. EX-1011, 46 (cited at Pet., 57). Further, the Petition established that the "accuracy and material capabilities" are received as taught in Hamilton, obviating the need for the user to manually measure printer characteristics. Pet., 57-58 (EX-1010, ¶¶[0015]-[0021]).

POR 49-50; Sur-Reply, 20.

The Challenged Claims are Patentable Under Ground 2A – No Fabrication Profile [1.5]

- Petitioner's Reply also failed to address that KISSlicer's material settings were entered manually by a user into the slicer's dialog
- Thus, the purported profile is not based on properties from the target printer
  - POR, 48-49; *see also* Reply, 20-21

> Further, *Evans* and *KISSlicer* do not teach creating a fabrication profile based on one or more properties from the target printer. *Evans* teaches that the user must manually measure the nozzle and filament diameters and enter them along with the layer height into the software, and *KISSlicer* simply shows a dialog for the user to enter material settings. EX1011 at 66-68; EX1012, 3. Thus, there is no disclosure that a fabrication profile is created based on one or more properties *from the target printer*. EX2014, ¶133.

The Challenged Claims are Patentable Under Ground 2A

- Douglas-Mark fails to teach limitation [1.6] of independent claim 1.

1. A method comprising:
receiving a request to fabricate an object from a three-dimensional model;
determining a target printer to fabricate the object;
querying the target printer for configuration information of the target printer relevant to creation of a printable model for fabrication of the object on the target printer;
receiving, from the target printer, a dictionary of configuration information containing one or more properties from the target printer that affect fabrication capabilities of the target printer;
creating a fabrication profile based on the one or more properties; and generating a machine-ready representation of the three-dimensional model executable by the target printer to fabricate the object.

Pet., 1.

Stratasys, Ex. 2016

The Challenged Claims are Patentable Under Ground 2A – No Machine-Ready Representation Generated [1.6]

- Without an object from a three-dimensional model (Section [1.1]) and without any slicing, there is nothing for Hamilton to generate a machine-ready representation of in the combination.
- Hamilton's designs already exist with printer instructions before any printer is determined or queried.
  - EX2015, 53:17; *see also* EX2014, ¶135.

13 Q To clarify, you're saying that a POSITA
14 would have been motivated to, then, generate the G
15 code, but Hamilton doesn't actually instruct the
16 POSITA to do so?
17 A Hamilton does not talk about G code.

The Challenged Claims are Patentable Under Ground 2A – No Teaching of the Dependent Claims

- Because Hamilton-Evans (with or without KISSlicer) fails to teach claim 1, Ground 2A also fails as to claims 2–5, 9, 10, 12, and 13.

2A	1-5, 9-10, 12-13	Hamilton and Evans (with/without KISSlicer)
2B	6-7, 19	Hamilton, Evans and Pax (with/without KISSlicer)
2C	19	Hamilton, Evans, Pax, and Pettis (with/without KISSlicer)
2D	8	Hamilton, Evans and Batchelder (with/without KISSlicer)

POR 50.

Grounds 2B-2E Fail

- None of Grounds 2B–2E independently challenges claim 1 — each adds one reference to the Hamilton-Evans combination.
- Ground 2B adds Pax (claims 6, 7, 19).
- Ground 2C adds Pettis (claim 19).
- Ground 2D adds Batchelder (claim 8).
- Ground 2E adds Wang (claim 20).
- Each fails for at least the same reasons as Ground 2A — and on the threshold prior-art status of Evans and KISSlicer.

POR, 50–52; PO Sur-Reply, 22–23; Pet., 1.

Grounds 2B-2E Fail – Ground 2D Has Additional Defects

- Ground 2D has the same firmware update vs. configuration defect shown for Ground 1C, as it introduces Batchelder for the same reason as that ground.
  - Pet., 83.

> Additionally, Batchelder explicitly discloses "firmware updates for the system" ("***a firmware configuration of the target printer***") as example printer property "assist[s] in building 3D model" ("***properties from the target printer that affect fabrication capabilities of the target printer***"). EX-1007, ¶¶[0052]-[0054],

POR, 51; PO Sur-Reply, 23.