

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SHENZHEN TUOZHU TECHNOLOGY CO., LTD.,
Petitioner,

v.

STRATASYS, INC.,
Patent Owner.

Case IPR2025-00321
Patent 9,421,713

**PETITIONER'S REPLY TO
PATENT OWNER'S RESPONSE TO PETITION**

TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	CLAIM CONSTRUCTION	1
	A. Petitioner identified which proposed claim constructions apply to each ground	1
	B. The purge tower need not have no contact with the part (Elements [1a] and [1c])	1
III.	THE POR FAILS TO ESTABLISH AN EARLIER PRIORITY DATE FOR THE '713 PATENT	2
	A. The evidence fails to demonstrate that the identified CMB file was ever executed on a three-dimensional printer having all recited claim features	3
	B. The evidence fails to demonstrate that the Solo/Mojo printer could execute CMB files	5
	C. No determination that the invention worked for its intended purpose.	8
	D. The CMB file does not provide all functionality of claim 16	10
	E. The Larson and Leavitt declarations should be afforded little to no weight.....	12
IV.	REPRAP VIDEO, REPRAP ARTICLE, AND KISSLICER ARE PRINTED PUBLICATIONS	13
V.	LEAVITT-REPRAP RENDERS OBVIOUS CLAIMS 1, 2, 5-7, 9, 16, AND 17	19
	A. A POSITA Would Have Been Motivated to Combine Leavitt and RepRap.....	19
	B. The Leavitt-RepRap Combination Provides Element [1c].....	21
	C. The Leavitt-RepRap Combination Provides Claim 16.....	25
	D. The Leavitt-RepRap Combination Provides Claim 5.....	25
	E. The Leavitt-RepRap Combination Provides Claim 17.....	26
VI.	THE PRIEDEMAN-KISSLICER COMBINATION RENDERS OBVIOUS CLAIMS 1, 2, 5-7, 9, 16, AND 17	26
	A. The Priedeman-Kisslicer Combination Provides Claims 1 and 16.	26
	B. The Priedeman-Kisslicer Combination Provides Claim 6.....	29
VII.	THE PRIEDEMAN-KISSLICER-REPRAP COMBINATION RENDERS OBVIOUS CLAIM 5.....	31
VIII.	BOYER ANTICIPATES CLAIMS 1, 2, 6, 7, AND 9.....	31

A. Boyer anticipates Claim Element [1a].....31
B. Boyer anticipates Claim Element [1c].....33

EXHIBITS

EX1001	U.S. Patent No. 9,421,713 to Swanson et al. (“the ’713 Patent”)
EX1002	Excerpts from the Prosecution History of the ’713 Patent (“the Prosecution History”)
EX1003	Declaration of Dr. Michael A. Hickner
EX1004	U.S. Publication No. 2009/0035405 (“Leavitt”)
EX1005	Dual extruder PLA printing (Oct. 29, 2012), <i>available at</i> https://www.okob.net/wp/index.php/2012/10/29/dual-extruder-pla-printing/ (“RepRap Article”)
EX1006	x2 dual color print (Oct. 29, 2012), <i>available at</i> https://www.youtube.com/watch?v=ZAafPtKjZSc (“RepRap Video”)
EX1007	U.S. Publication No. 2003/0004600 (“Priedeman”)
EX1008	U.S. Publication No. 2014/0034214 (“Boyer”)
EX1009	KickStarter Campaign For Dual Extruder (2012), <i>available at</i> https://reprap.org/forum/read.php?1,137362,137887#msg-137887
EX1010	KISSlicer Quick-Start Guide (2012), <i>available at</i> https://web.archive.org/web/20121224171520/http://kisslicer.com/files/KISSlicerQuickStart.pdf#expand (“KISSlicer”)
EX1011	U.S. Patent No. 7,625,200 (“Leavitt-200”)
EX1012	U.S. Patent No. 7,604,470 (“LaBossiere”)
EX1013	Evans, <i>Practical 3D Printers, The Science And Art Of 3D Printing</i> (2012)

EX1014	whistle_x2_body.stl (2012), <i>available at</i> http://www.okob.net/wp/wp-uploads/2012/10/whistle_x2_body.stl
EX1015	whistle_x2_text.stl (2012), <i>available at</i> http://www.okob.net/wp/wp-uploads/2012/10/whistle_x2_text.stl
EX1016	Declaration of Denis Bakin
EX1017	Declaration of Jonathan Dummer
EX1018	Declaration of Kathryn Talbot
EX1019	December 17, 2024 stipulation sent by Petitioner’s counsel to Patent Owner’s counsel
EX1020	Docket Control Order (Document 34), <i>Stratasys, Inc. v. Shenzhen Tuo Zhu Technology Co. Ltd. et al</i> , 2-24-cv-00644 (EDTX)
EX1021	April 8, 2025 Sotera Stipulation
EX1022	June 17, 2025 Stipulation
EX1023	Second Declaration of Dr. Michael A. Hickner
EX1024	U.S. Patent No. 10,583,604 (“Yuyama”)
EX1025	Transcript of November 4, 2025 deposition of Dr. Tim A. Osswald.
EX1026	Fortus 360mc / 400mc 3D Production System User Guide (2015)
EX1027	Mojo 3D Printer User Guide (2016) <i>available at</i> https://support.stratasys.com/en/Printers/FDM-Legacy/Mojo

- EX1028 KISSlicer pre-release 1.0.8 (2012), *available at*
<https://community.ultimaker.com/topic/444-kisslicer-pre-release-108/>
- EX1029 Transcript of November 12, 2025 deposition of Gary Larson.
- EX1030 Transcript of November 21, 2025 deposition of Paul Leavitt.
- EX1031 KISSlicer (2012), *available at*
<https://community.ultimaker.com/topic/340-kisslicer/>
- EX1032 Introducing KISSlicer (2012), *available at*
<https://reprap.org/forum/read.php?156,88154,page=2>
- EX1033 U.S. Patent No. 10,065,354 (“O’Neil”)
- EX1034 U.S. Patent No. 9,688,025 (“Stava”)
- EX1035 Redline Comparison of EX2014 and EX2015
- EX1036 Petronas Twin Towers, *available at*
<https://www.petronastwintowers.com.my/the-towers/design-structure/>

I. INTRODUCTION

Patent Owner (“PO”) relies on improperly narrow claim interpretations while ignoring the clear disclosures of the prior art in its attempt to distinguish the challenged claims from the cited references. Additionally, PO has failed to establish an earlier reduction to practice prior of the ’713 patent.

II. CLAIM CONSTRUCTION

A. Petitioner identified which proposed claim constructions apply to each ground

Petitioner has identified “how the challenged claim is to be construed” for each challenged claim. *See* 37 C.F.R. § 42.104(b)(3). EX1023, ¶7. Petitioner’s presentation of alternative constructions for Element [1a] and identification of which grounds apply to which construction satisfies 37 C.F.R. § 42.104(b)(3) and is fully proper. *See Hologic, Inc. v. Enzo Life Sci., Inc.*, IPR2018-00019, Paper 21 (P.T.A.B. November 28, 2018).

B. The purge tower need not have no contact with the part (Elements [1a] and [1c])

Stratasys seeks to improperly inject unclaimed limitations into Element [1c], demanding that the at least one purge tower *have no physical contact with* the three-dimensional part or the support structure. EX1023, ¶8; *see e.g.*, POR, 62-63, 92-93.

The claims do not recite such a requirement and PO identifies no portions of the specification, prosecution history, or any other intrinsic or extrinsic evidence that would support a narrow reading. *SuperGuide Corp. v. DirecTV Enterprises, Inc.*, 358 F.3d 870, 874-875 (Fed. Cir. 2004) (“not a substitute for, nor can it be used to rewrite, the chosen claim language”). The fact that the “purge tower” is recited independently of the “three-dimensional part” does not mean that the claims prohibit any physical contact between the two. Indeed, the “three-dimensional part” is recited separately from the “support structure” yet Stratasys’s expert has stated that those two elements will generally be in physical contact. EX1025, 36:21-37:6, 35:18-36:2; EX1023, ¶9.

The ’713 Patent explains that “purge tower 24 may be printed at *any suitable free location* on build substrate 44.”¹ EX1001, 8:30-38. There is no disclosure in the specification that the x-y location of the purge tower is prohibited from being adjacent to or otherwise in contact with the three-dimensional part. EX1023, ¶10.

III. THE POR FAILS TO ESTABLISH AN EARLIER PRIORITY DATE FOR THE ’713 PATENT

Stratasys has failed to demonstrate an actual reduction to practice of the claims prior to the ’713 patent filing date and therefore fails to establish an earlier priority date.

¹ All emphasis added unless otherwise noted.

“[T]o establish an actual reduction to practice, *the inventor* must prove that:

(1) *he* constructed an embodiment or *performed a process* that met all the *limitations* of the interference count; and (2) he *determined that the invention would work for its intended purpose.*” *Cooper v. Goldfarb*, 154 F.3d 1321, 1327 (Fed. Cir. 1998); *see also UMC Elecs. Co. v. United States*, 816 F.2d 647, 652 (Fed. Cir. 1987) (“There cannot be a reduction to practice of the invention...without *a physical embodiment which includes all limitations of the claim.*”).

A. The evidence fails to demonstrate that the identified CMB file was ever executed on a three-dimensional printer having all recited claim features

Stratasys has failed to demonstrate that the CMB file relied upon in the declarations was ever actually executed on a three-dimensional printer, much less a printer meeting all requirements recited by claims 1 and 16. Stratasys relies on the “Solo printer” as allegedly proving the “additive manufacturing system” having “multiple print heads” recited in claims 1 and 16. EX2014, 56-57, 86-87; EX2015, 56-57, 86-87. Stratasys further relies on a specific CMB file as allegedly demonstrating all of the functionality recited in the challenged claims. EX2014, ¶¶15-22, Exhibit A; EX2014, ¶¶15-22, Exhibit A.

However, the evidence of record fails to demonstrate that the identified CMB file was ever executed on a Solo printer (or other multi-head printer) and

Stratasys has not identified any other files that allegedly perform all claim steps.

Inventor Gary Larson submitted a declaration in which he discusses both the Solo printer and the CMB file but never alleges that he or either of his co-inventors ever actually executed the CMB. Under questioning, he stated that he “could not say for certain” if he had “ever, personally, execute[d] this CMB file on a three-dimensional printer.” EX1029, 19:16-18. When asked if he could “recall personally witnessing anyone execute this CMB file on a three-dimensional printer” he responded “No.” *Id.*, 20:6-8.

Similarly, when Paul Leavitt was asked if he had “personally, execute[d] this CMB file on a three-dimensional printer” or “personally, witness[ed] someone execute this CMB file on a three-dimensional printer” he responded “I do not recall” to both questions. EX1030, 22:20-23:7. Mr. Leavitt stated that this file was “in a folder” and that “the test engineer would – print the parts in the folder.” *Id.*, 23:5-19. However, Mr. Leavitt did not recall witnessing the test engineer execute the specific CMB file cited in his declaration (the only CMB file that Stratasys’s alleges as performing all claimed functions), and also did not personally send the CMB file to the test engineer to execute. *Id.*, 23:3-23. Even if Mr. Leavitt’s assertion that he had personally printed other files having a purge tower were true, this is insufficient to demonstrate that all method steps of claims 1 and 16 were performed prior to filing of the ’713 patent. *Id.*, 22:23.

Mr. Leavitt's testimony is particularly suspect due to both inconsistencies with the testimony of Mr. Larson and internal inconsistencies in his testimony. For example, when asked about *Mr. Leavitt's role* in the project, Mr. Larson stated that "*he wasn't involved in solo, at all, at that time.*" EX1029, 13-16. Furthermore, Mr. Leavitt stated that "[t]his CMB file was last modified on July 5, 2011" but then later testified that it was "executed" in "Q1" of 2011 (prior to the file's modification date). EX2015, ¶16; EX1030, 47:19-21.

Because neither witness was able to confirm that they personally executed the CMB file relied upon by Stratasys or witnessed someone execute the CMB file, Stratasys has failed to demonstrate an earlier reduction to practice.

B. The evidence fails to demonstrate that the Solo/Mojo printer could execute CMB files

The evidence of record casts serious doubt on whether the CMB file discussed in the declarations was even compatible with the Solo printer. Larson and Leavitt stated the CMB file was designed for use with a "Fortus 400mc Large" printer:

Information on

General

Machine type: Fortus 400mc Large

Extruder index: 1

Material: ABS-M30

Color: not specified

Tip size: T12

Volume: 4.274194

Slice height: 0.0070

Number of slices: 607

System mode: none

Part build style: none

Shrink factor (X Y Z): 1.000000 1.000000 1.000000

☐ Has variable width

☐ CMB locked

User name:

Embedded version:

System Serial#:

Internals

Comment: Packed file written by Control Center!!!

Pack list: purge_part+support-11

Versions: 8.1 (4255) 8.9

GUID:

Limits

Part width: 0.0110 0.0600

Part area: 0.0001 in² 0.0004 in²

Part aspect ratio: 1.5767 8.5714

Support width: 0.0121 0.0191

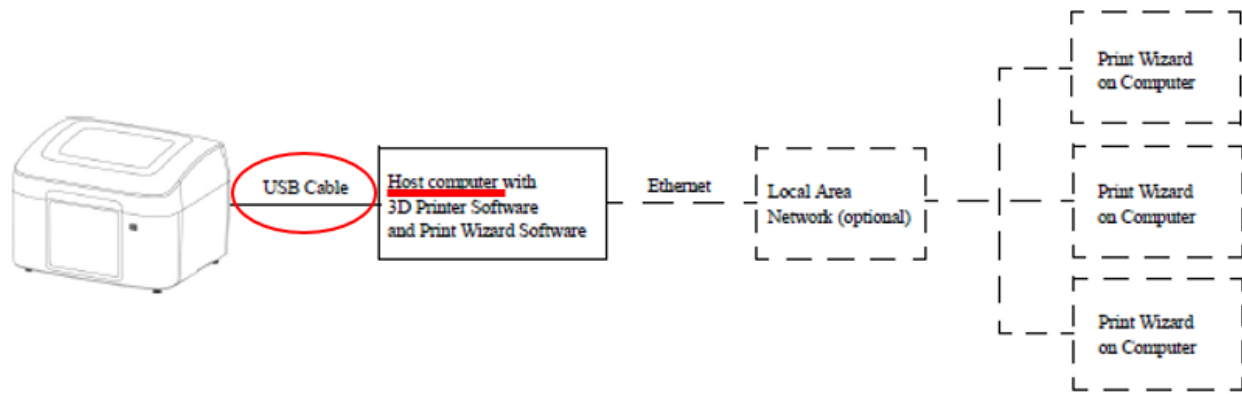
Support area: 0.0001 in² 0.0001 in²

Support aspect ratio: 1.7244 2.7303

EX2014, ¶16; EX2015, ¶16.

Mr. Larson states that “early on in the Solo project development CMB files for the Fortus 400mc were repurposed for the smaller Solo printer” but Stratasys’s own documentation indicates that CMB files were incompatible with the Solo printer. EX2014, ¶16. During his deposition, Mr. Larson explained that CMB files were derived from “STL files” which were “converted into a CMB file” using Insight software. EX1029, 17:9-11, 24:1-17. The Solo printer “was ultimately adapted for release to the public as the Mojo 3-D printer.” EX2014, ¶6. However, Stratasys’s own documentation on the Mojo printer describes that the Mojo printer received STL files directly rather than CMB files. EX1027, 8. The User Guide

describes that “[t]he Mojo system builds models from *CAD STL files* that are *sent to the system using a USB cable* from a dedicated *host computer*.” *Id.*



EX1027, 21. Additionally, the workstation for the Mojo printer operated using Print Wizard software, a distinct software tool from Insight. EX1027, 7-8, 17, 31 (“the STL file is brought into Print Wizard”); EX1029, 61:24-62:5.

By contrast, the Fortus 360mc / 400mc User Guide confirms that the Fortus 400mc printer used the Insight software discussed in the declarations to generate CMB files from STL files at the host computer before sending the CMB files to the printer. EX1026, 47, 42, 83-88.

Stratasys has provided no documentation to establish that the *Solo/Mojo printer* was actually compatible with Insight software or was capable of receiving/executing CMB files rather than STL files. As such, Stratasys relies on the testimony of Larson and Leavitt *alone* for the premise that the identified CMB file was compatible with and could be executed on a Solo/Mojo printer. The uncorroborated testimony of Stratasys’s employees is insufficient to establish

compatibility of the Solo/Mojo printer with the identified CMB file. *Kolcraft Enters. v. Graco Children's Prods.*, 927 F.3d 1320, 1324 (Fed. Cir., 2019); *Mahurkar v. C.R. Bard, Inc.*, 79 F.3d 1572, 1577 (Fed. Cir. 1996); *Singh v. Brake*, 222 F.3d 1362, 1367 (Fed. Cir. 2000). Although “oral testimony of someone other than the alleged inventor may corroborate an inventor's testimony,” such “post-invention oral testimony is more suspect, as there is more of a risk that the witness may have a litigation-inspired motive...and that the testimony may be inaccurate.” *Sandt Tech., Ltd. v. Resco Metal & Plastics Corp.*, 264 F.3d 1344, 1351 (Fed. Cir. 2001).

The fact that Stratasys’s own Mojo User Manual describes that the Mojo printer executed STL files directly, rather than CMB files, casts serious doubt on the testimony of the declarants that the CMB files discussed in the Larson and Leavitt declarations were ever executed on a Solo printer.

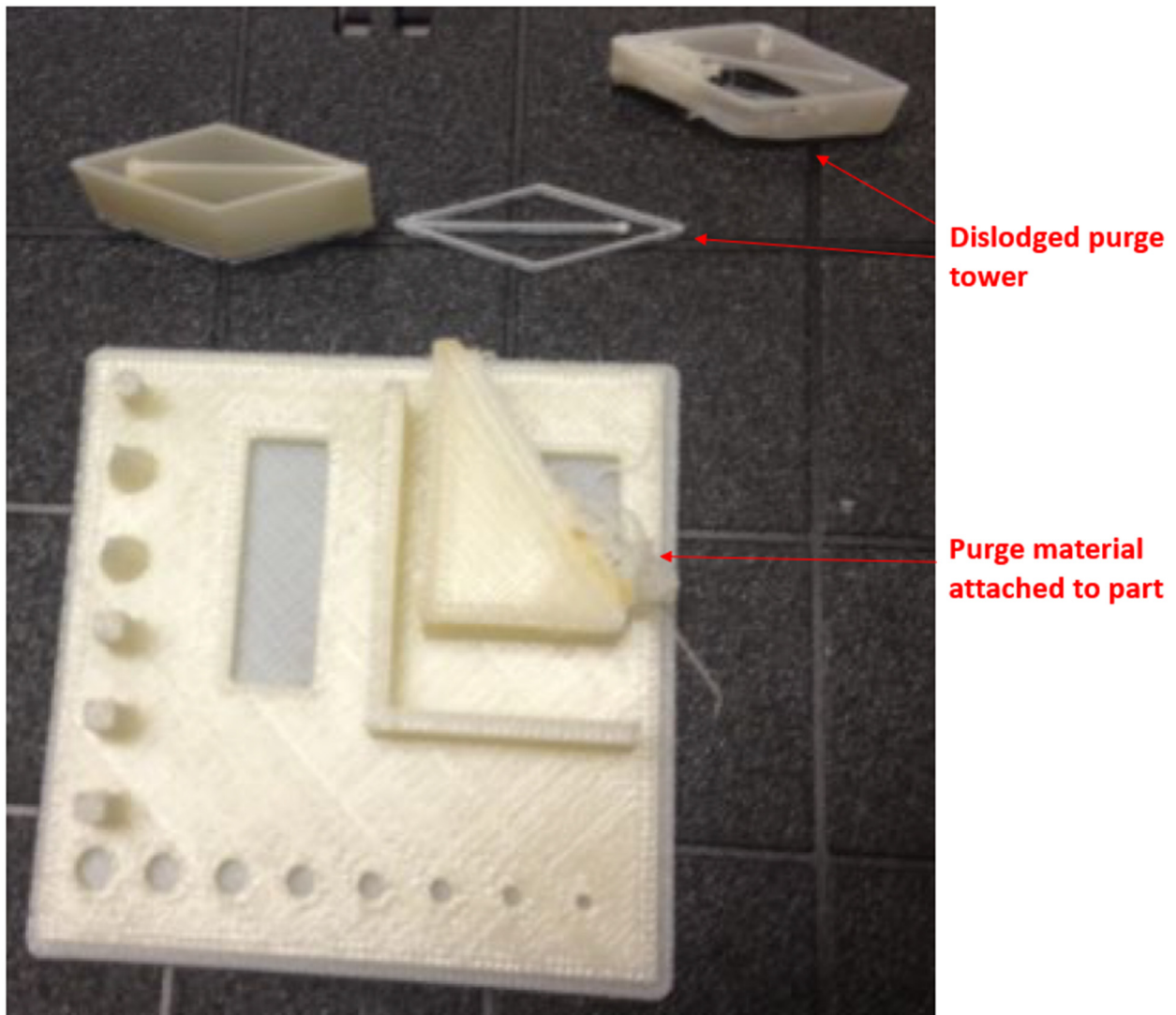
C. No determination that the invention worked for its intended purpose.

Reduction to practice requires that the inventor “determined that the invention would work for its intended purpose.” *Cooper*, 154 F.3d at 1327. Larson testified that in the actually implemented purge tower attempts discussed in paragraph 25 of his declaration (involving a different design than the CMB file) the “purge tower failed...it delaminated from that layer on...the foundation” and the

“purge material actually ended up in [the] part.” EX1029, 76:7-15, 77:2-11

(“...this is a great example of why that failed”), 77:16-21 (stating that “on the support side, we never could” successfully implement a purge tower, “it just didn’t work out.”), 78:4-12; EX1030, 53:20-54:5 (“...that’s a common failure.”), 56:2-20.

Larson’s declaration shows this failure:



EX2014, ¶25 (annotated); EX1029, 77:18-21 (“there’s that big glob of material”).

For these reasons, the record fails to demonstrate a date by which the inventors “determined that the invention would work for its intended purpose.”

D. The CMB file does not provide all functionality of claim 16

Even if executed, the relied upon CMB file would not have performed all steps of claim 16. Claim 16 recites in part:

“(a) printing a first layer of a support structure...(c) printing a first layer of the three-dimensional part *on at least a portion of the first layer of the support structure*...and (e) printing a second layer of the support structure *on at least a portion of the first layer of the three-dimensional part*...”

EX1001, cl. 16.

That is, claim 16 requires a first three-dimensional part layer above/on the first support layer, and a second support layer above/on *the first* three-dimensional part layer. Stratasys relies on *layer 207* of the CMB file as allegedly providing the “first layer of support structure” (Element [16a]). POR, 29. Stratasys then identifies *layer 208* as allegedly providing the “*first layer of the three-dimensional part*” (Element [16c]). *Id.*, 30-32. Because Stratasys relies on layer 208 for Element [16c], in order to demonstrate that the CMB file provides Element [16e], Stratasys would need to identify some portion of the support material of layer 209 printed “on at least a portion of the first layer of the three-dimensional part” that

Stratasys identified in layer 208. However, when addressing Element [16e], Stratasys does not discuss layer 209 at all. POR, 33-35. Rather, Stratasys alleges that a separate portion of support structure in layer 208 is deposited over part material of layer 207. *Id.* This analysis from Stratasys fails to demonstrate that the CMB file provides all elements of claim 16 because Stratasys relies on part material in *layer 208* to allegedly provide “*a first layer of the three-dimensional part*” with respect to Element [16c] but then relies on part material from *layer 207* for “*the first layer of the three-dimensional part*” with respect to Element [16e]. *Id.*, 30-35. Stratasys cannot rely on two different portions of part material from two different layers for providing the same “first layer of the three-dimensional part” in Elements [16c] and [16e].² While Stratasys later discusses layer 209 with respect to claim 17, the POR does not attempt to demonstrate that support material in layer 209 is printed on at least a portion of the first layer of the three-dimensional part from layer 208.

² Stratasys’s analysis of claim 17 includes a similar flaw, analyzing only layers 209 and 210 rather than three distinct layers. POR, 35-39.

E. The Larson and Leavitt declarations should be afforded little to no weight

The declarations of Larson and Leavitt should be afforded little to no weight because they were entirely drafted by counsel for Patent Owner rather than the declarants and they are nearly word-for-word identical. *See Ronald Xavier Collins v. United States of America et al*, No. 5:2020cv02582 - Document 63 at 4:27-5:3 (C.D. Cal. 2023)³; EX1035 (redline comparison of Larson and Leavitt declarations); EX1029, 9:6-23 (“Counsel prepared the drafts..all or all of the words were by counsel”), 9:24-7:17 (could not explain overlap with Leavitt declaration); EX1030, 11:4-8 (“I didn’t do any typing”), 10:13-11:3 (could not explain overlap with Larson declaration). As mentioned above, the Federal Circuit has expressed that “post-invention oral testimony *is more suspect*, as there is more of a risk that the witness may have a litigation-inspired motive.” *Sandt Tech.*, 264 F.3d at 1351. The testimony here, that is written not oral and drafted by the attorneys rather than the declarant, makes such “post-invention” testimony even “more suspect.”

³ <https://law.justia.com/cases/federal/district-courts/california/cacdce/5:2020cv02582/804975/63/>

IV. REPRAP VIDEO, REPRAP ARTICLE, AND KISSLICER ARE PRINTED PUBLICATIONS

Contrary to Stratasys's assertions, RepRap Video, RepRap Article, and Kisslicer were all publicly accessible printed publications prior to the priority date of the '713 patent.

RepRap's "*digital video*...is considered to be a 'printed publication'". MPEP § 2128(II)(A))⁴. Federal courts have held that YouTube "videos meet the definition" of "a printed publication" and searching based on the title, specific subject matter, or other keywords "does not exceed the reasonable diligence" that the law expects of a hypothetical prior-art subject.". *HVLPO2, LLC v. Oxygen Frog, LLC*, 2018 U.S. Dist. LEXIS 245874, *1-4 Case No. 4:16cv336-MW/CAS (N.D. Fla., May 28, 2018). Thus "someone interested and ordinarily skilled in the pertinent art, exercising reasonable diligence, would have been able to locate" the RepRap Video as of its publication date. *Id.*

YouTube is also a "well-known, reputable compiler and publisher." *Ericsson Inc. v. Intell. Ventures I LLC*, IPR2014-00527, Paper 41 at 10-11 (PTAB May 18,

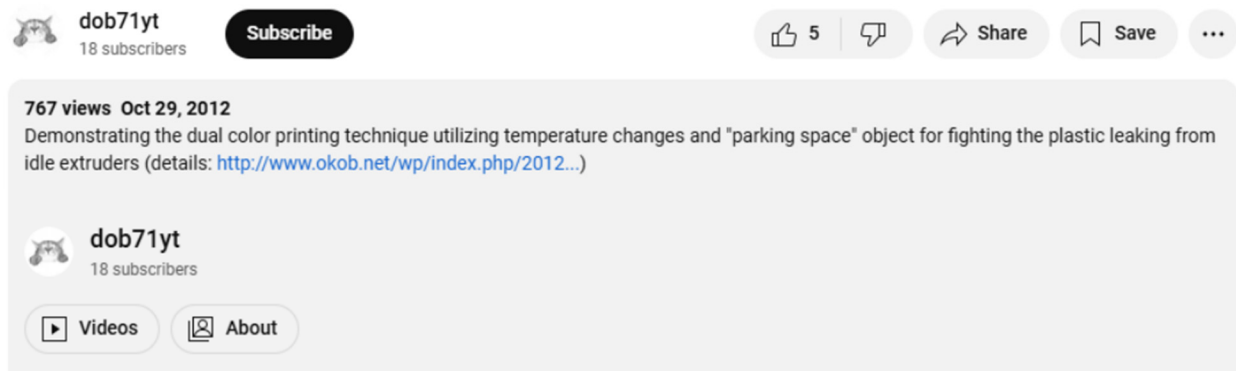
⁴ *See also*

https://www.uspto.gov/sites/default/files/aia_implementation/fitf_comprehensive_training_prior_art_under_aia.pdf at 15.

2015); *see also VidStream LLC v. Twitter, Inc.*, 981 F.3d 1060, 1065-66 (Fed. Cir. 2020) (“...presumption of public accessibility as of the publication date.”).

The PTAB has held that a YouTube publication date indicates the date when that video “was available to the public.” *Mission Integrated Tech. LLC, v. Joshua Clemente*, IPR2023-01285, Paper 16 at 19, 22-23 (PTAB Feb. 23, 2024); *see also K/S HIMPP v. Bragi GmbH*, IPR2023-00901, Paper 14 at 15 (PTAB Nov. 13, 2023); *Danxiao Inf. Tech. LTD v. Shenzhen Svakom Tech. Co. LTD*, PGR2022-00050, Paper 36 at 6-7 (PTAB Jan. 19, 2024); *London Luxury LLC v. E&E Co., Ltd.*, PGR2021-00083, Ex. 1013 (Google testifying “the date listed under a video is the date it was published.”).

Public availability of RepRap Video as of Oct. 29, 2012 is confirmed by expert testimony and by the video page itself:

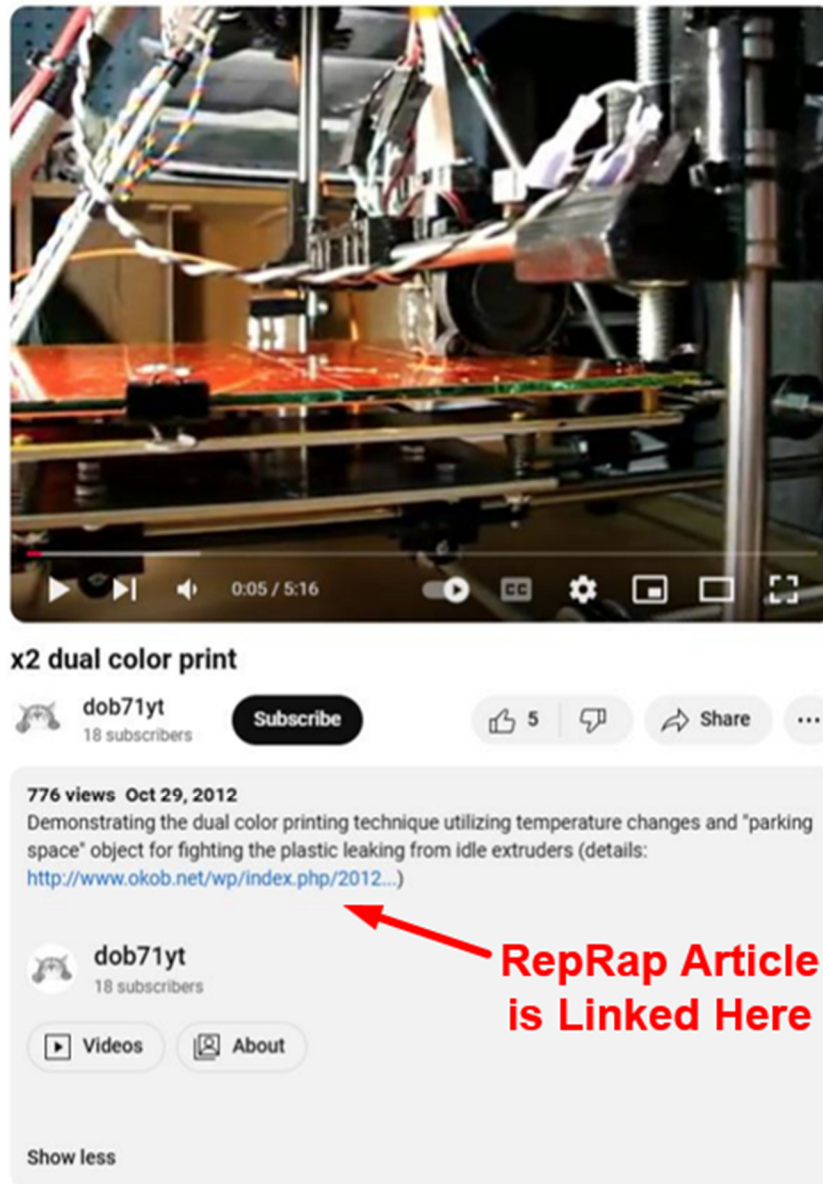


EX1016, Appendix B; EX1018, ¶¶12-21.

Denis Bakin confirms that interested members of the public would have been able to find RepRap Video through reasonable diligence, such as by using

YouTube's search functionality and browsing pages dedicated to the relevant technology. EX1016, ¶¶3, 5; *see also HVLPO2*, 2018 U.S. Dist. LEXIS 245874, *3-4.

Bakin testified that RepRap Article (EX1005) was available on his website www.okob.net "since October 29, 2012." EX1016, ¶ 7. Since October 29, 2012 RepRap Article has been directly linked on the YouTube page for RepRap video:



EX1016, Appendix B.

The affidavit of Jonathan Dummer confirms that the KISSlicer Quick-Start Guide was publicly accessible by interested users on www.kisslicer.com “no later than February 2012.” EX1017, ¶2. An archived version of the KISSlicer website

reveals the Quick-Start Guide is dated “Feb 15, 2012,” consistent with Mr. Dummer’s testimony.

- **Documentation**

- KISSlicer Quick-Start Guide - English (Feb 15, 2012)
([PDF](#)) ([HTML](#))

EX1017, Appendix A, p. 1.

According to Mr. Dummer, the KISSlicer website was “popular” in the 3D printing community by early 2012. EX1018, ¶2. Evidence of industry discussions from that time support this assessment. Multiple forum posts from early 2012 discuss the KISSlicer website, KISSlicer software, and Mr. Dummer at length. EX1028, 1; EX1031, 1; EX1032, 1. As such, interested persons knew about KISSlicer website. Because the Quick-Start Guide was prominently displayed on the website, this reference was “*made accessible* to the extent that persons interested and ordinarily skilled in the subject matter or art *exercising reasonable diligence, can locate it.*” *Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1348 (Fed. Cir. 2016).

No search engine was necessary because a link to the KISSlicer Quick-Start Guide was placed prominently on the “Downloads” page of the website.



Download

The program is the same for the FREE and PRO versions. Simply select your Operating System and download the zip file. Updating is as simple as overwriting the executable with the latest version (your settings and PRO Key are kept in different files).

Tip: Under Windows, put a link to KISSlicer.exe in your 'Send To' folder.

Download Links

- Main Program



- [Windows](#) (ver 1.0.7)



- [Linux](#) (ver 1.0.7)



- [Mac](#) (ver 1.0.7) - this version puts the INI files in the same path as the .app bundle, so move any custom INI files there first.

- Documentation

- KISSlicer Quick-Start Guide - English (Feb 15, 2012)
([PDF](#)) ([HTML](#))



The download link is visible here

EX1017, Appendix A (annotated). Interested persons would have visited the KISSlicer website and immediately located the download button for KISSlicer Quick-Start Guide. EX1018, ¶2.

V. LEAVITT-REPRAP RENDERS OBVIOUS CLAIMS 1, 2, 5-7, 9, 16, AND 17

A. A POSITA Would Have Been Motivated to Combine Leavitt and RepRap

As discussed in the Petition, material that oozes from an idle nozzle in Leavitt's printer *would not have the same texture* as material extruded from an active nozzle because oozed material outside of the nozzle cannot be reheated to the same temperature. EX1023, ¶¶11-12; EX1003, ¶¶52-53. Stratasy's expert admitted that this oozed material would remain on the exterior of the extruder tip, further away from the heat source. EX1025, 21:23-22:10 ("It stays there on the tip."). Applying RepRap's suggestion to prime the nozzles would prevent the oozed material from being deposited on the part. EX1023, ¶12.

That Leavitt employs a different solution is immaterial because Leavitt's technique (raising an inactive nozzle) "*reduces*" but does not entirely eliminate "the risk that the residual support material comes into contact with the layer." EX1004, [0032]; EX1025, 26:13-28:1; EX1023, ¶¶13-15. There is no teaching away because application of RepRap's purge tower teachings to Leavitt would have contributed to reducing the risks of defects even further. *See SightSound Techs., LLC v. Apple Inc.*, 809 F.3d 1307, 1320 (Fed. Cir. 2015).

Stratasy's assertion that RepRap's purge operation slows down the printing process ignores relevant context. POR, 55. RepRap is clear that it is not the

“parking space” that “slows down the print” but rather the *act of switching extruders* (e.g., to heat/cool the nozzles). EX1005, 1. That is, *any printer* that switches between two different extruders to deposit different material would exhibit the same slowness, including the printer in Leavitt. EX1023, ¶16; EX1025, 33:9-34:10, POR, 54-55. Stratasys admits that “[u]sing purge operations to ‘prime’ the extruders in general was already known in the art” and RepRap describes a specific purge operation that would result in faster printing as compared with other purge operations. POR, 54-55; EX1003, ¶54.

Contrary to Stratasys’s assertion that “polymer melts would not ‘leak’ or ‘drip’ from the extruder head” (POR, 56), multiple references confirm it was a commonly recognized problem for idle 3D printer nozzles to drip around the time of the ’713 Patent. EX1024, 2:4-19; EX1033, 8:33-39 (“avoid dripping”); EX1034; EX1007 (“...materials will drain uncontrollably...‘ooze’”). EX1023, ¶¶17-19. Leavitt’s discussion of “ooze” indicates material drip in some cases. EX1004, [0032].

A POSITA would have applied RepRap’s purge operation to Leavitt to ready nozzles for printing by “establish[ing] the consistent flow of plastic.” EX1005, 1; Pet., 14; EX1003, ¶56; EX1023, ¶20. The existence of other possible solutions (purge buckets) is not a teaching away. *See PAR Pharm., Inc. v. TWI*

Pharms., Inc., 773 F.3d 1186, 1197-98 (Fed. Cir. 2014); *Galderma Labs., L.P. v. Tolmar, Inc.*, 737 F.3d 731, 738 (Fed. Cir. 2013).

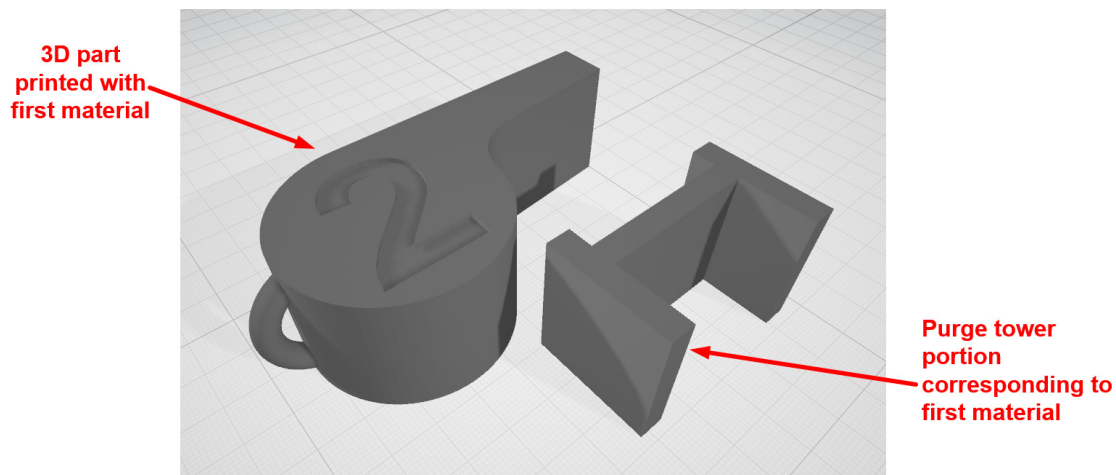
B. The Leavitt-RepRap Combination Provides Element [1c].

RepRap Article describes printing a purge tower layer when each print head is switched to the operating mode, describing raising the temperature of an extruder “when it is time to start printing with that extruder again,” and “print[ing]” a “parking space” to “prime” an extruder “*before printing* the actual object *after the temperature change*.” EX1005, 1; EX1023, ¶¶21-24; EX1003, ¶¶80, 82-83.

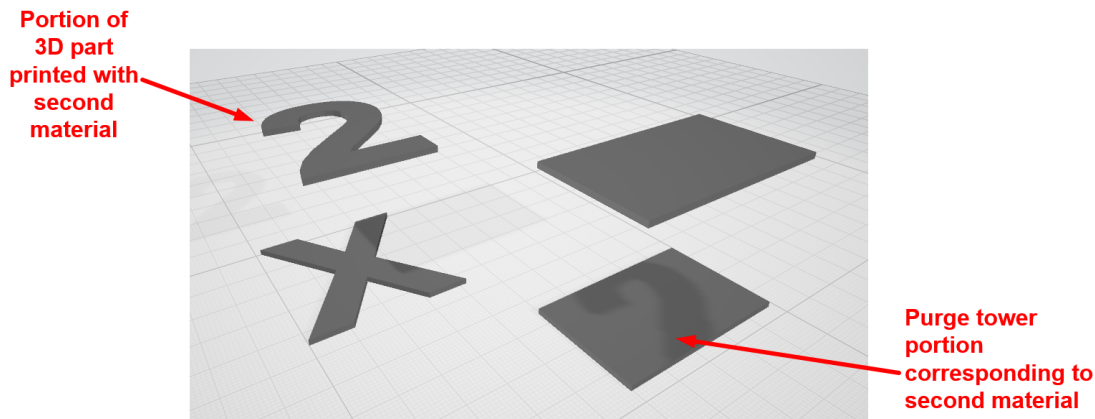
Applying this to Leavitt results in a purge tower being printed in a “layer-by-layer manner.” Leavitt explains that extrusion head 18 toggles between depositing a build material to print a *three-dimensional part* and depositing a support material to print *support structure*. EX1004, [0022]-[0024]. The extrusion head therefore builds the part and support structure layer-by-layer according to an additive manufacturing process where deposition lines transition between the stand-by mode and the operating mode. Applying RepRap’s suggestion to perform a purge operation “before printing the actual object after the temperature change” when switched to the operating mode results in a purge tower that is printed “in a layer-by-layer manner.” EX1023, ¶¶25-26.

Stratasys's assertion that plugging the inactive nozzle would cause "leakage" onto the parking space is unsupported by RepRap. POR, 59. However, even if true, this would not negate RepRap's express disclosure of printing layers of the parking space "before printing the actual object." EX1005, 1. There is no limitation in the claims that the purge tower cannot serve multiple functions. EX1023, ¶27.

Stratasys's complaint regarding "clumps of material" on the top of the parking space in the example implementation in the RepRap Video do not negate the clear disclosures of RepRap Article. POR, 62. Indeed, the alleged "clumps" and "strings" of material are simply the result of a layer of orange material over an area of the parking space where there is not previous part layers to support the top, orange layer. EX1023, ¶28. This is demonstrated by the STL files for each material, which show that the top orange layer is partially printed over empty space:



EX1014, 1 (annotated).

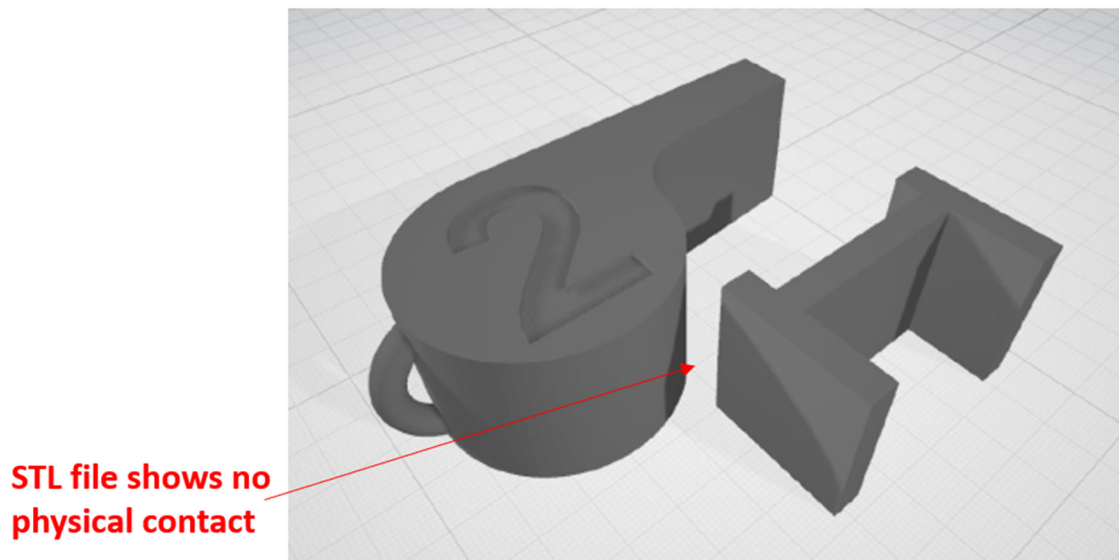


EX1015, 1 (annotated).

Even if the claims required only one material per layer of the purge tower (POR, 59), RepRap demonstrates such a feature as shown in EX1014 and EX1015, above, where the top (orange) purge layer has the same length/width as the entire I-shaped (white) purge layers and therefore entirely white layers are printed after the bottom orange layer and at least part of the top orange layer is printed over a layer of white material. EX1023, ¶29.

Regarding the alleged “physical connection between whistle and parking space,” (POR, 62-64), there is no requirement in claim 1 that the purge tower and three-dimensional part have no physical contact with one another. EX1023, ¶¶30-32; *supra*, §II.B. Furthermore, the proposed combination does not rely on bodily incorporation of the example implementation in RepRap video (which includes unintended strands between the parking space and object) but rather relies on RepRap Article and RepRap video for all that they disclose to a POSITA, which

includes the teaching in RepRap Article of a separate “parking space.” *In re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012); *Axonics, Inc. v. Medtronic, Inc.*, 73 F.4th 950, 957 (Fed. Cir. 2023).



EX1014.

The red image captured by Stratasys appears to show a tool path, not deposition layers:



EX1006, 4:22.

In the Leavitt-RepRap combination, the purge tower is printed in a layer-by-layer manner because Leavitt discloses alternating between printing layers of part and support material and RepRap discloses that, *in the combination*, the printer

prints a layer of the purge tower (“parking space”) “before printing the actual object” for every switch of material. EX1004, [0022]-[0024]; EX1005, 1; EX1023, ¶¶33-36.

C. The Leavitt-RepRap Combination Provides Claim 16.

The POR’s claim 16 arguments largely repeat those with respect to claim 1. The Leavitt-RepRap combination provides printing the purge tower in a layer-by-layer manner when each nozzle is switched to the operating mode for the reasons discussed above. *See* Pet., 37-41. Leavitt explains that “extrusion head 18 may *initially be positioned in the support state* for forming a layer of support structure 22, and then *toggle to the build state* to form a layer of 3D object 20.” EX1004, [0023]. When Leavitt’s extrusion head is implemented to perform a purge operation as disclosed by RepRap, the extrusion head would print one or more layers of a purge tower “before printing” the corresponding layer of part or support material for the 3D object. EX1005, 1; EX1023, ¶¶37-39.

D. The Leavitt-RepRap Combination Provides Claim 5.

Claim 5 is met by any disclosure of a purge tower for which at any point along the vertical axis the cross-sectional area of the purge tower reduces. EX1023, ¶40; EX1003, ¶¶95-97. The fact that RepRap’s parking space later increases in cross-sectional area after earlier decreasing in cross-sectional area is irrelevant.

E. The Leavitt-RepRap Combination Provides Claim 17.

Leavitt is clear that the printer “toggle[s] between a ‘build state’ and a ‘support state’” to repetitively print “subsequent layers of deposited build and/or support materials” and that “[t]his process may be repeated until each layer of 3D object 20 and support structure 22 are complete.” EX1004, [0022]-[0024]; EX1023, ¶¶41-42. In the combination, the printer “print[s]” a layer of parking space after each change of material. EX1005, 1. Steps (b)-(e) of claim 16 are thus repeated. Pet., 41-42; EX1003, ¶¶138-141.

VI. THE PRIEDEMAN-KISSLICER COMBINATION RENDERS OBVIOUS CLAIMS 1, 2, 5-7, 9, 16, AND 17

A. The Priedeman-Kisslicer Combination Provides Claims 1 and 16.

Stratasys’ arguments for Ground 2A depend on an erroneous contention that Kisslicer’s “wipe pillar” is “unrelated to a purge operation.” POR, 75-76; EX2013, ¶118. However, Kisslicer’s wipe pillar is not formed from a rogue wiping process, but rather is a “cylinder *printed* before every layer.” EX1010, 9. The fact that Kisslicer’s wipe pillar is (1) printed, (2) has a specific shape (“cylinder”), and (3) is multi-layered (“...before every layer”) indicates that it provides the claimed purge tower printed in a layer-by-layer manner. EX1023, ¶43.

Stratasys’s insistence that Kisslicer’s wipe pillar is printed *after* printing the part or support structure is directly refuted by the actual disclosure of Kisslicer

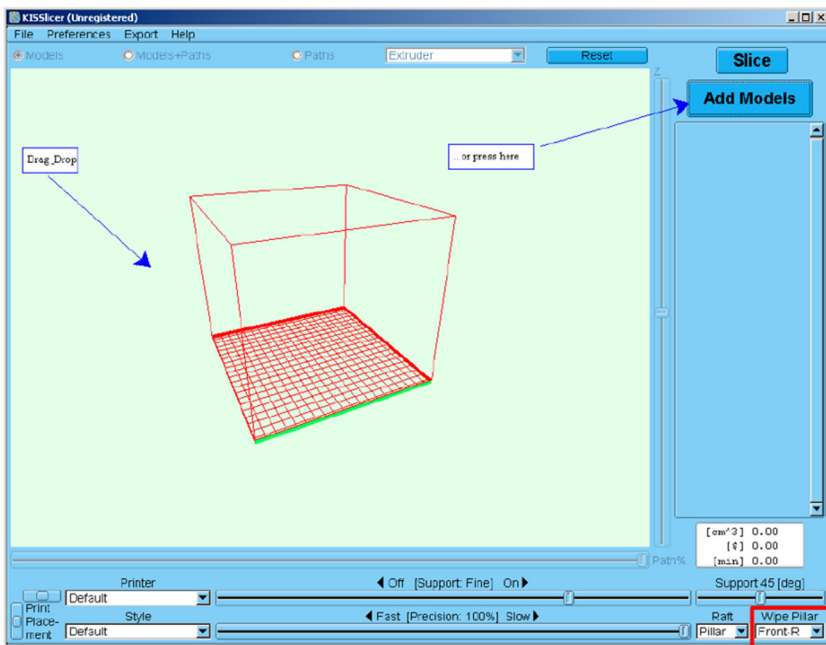
itself. POR, 76; EX2013, ¶119; EX1010, 9-10. Kisslicer is clear: “[t]he wipe pillar is a cylinder printed *before* every layer to clean the extruder tip.” EX1010, 9; EX1023, ¶¶44-45, 47. Dr. Osswald’s assertion that a tip wipe operation to eliminate “hairing” must only occur after printing a layer (POR, 76; EX2013, ¶119), is unsupported by the record. Hairing from a prior use can just as easily be eliminated when a nozzle is switched to an active mode prior to printing the part. EX1023, ¶45. What’s more, Kisslicer discloses a “Wipe [mm]” setting for printing the wipe pillar and discloses that “*after* a warm up the printer will push (*prime*) this amount of filament *to ensure the printer is ready*.” EX1010, 10.

Kisslicer’s description that its wipe pillar “is extremely important in dual head prints” similarly directly refutes Dr. Osswald’s assertion that such printing *before* every layer is practiced only when there is a single print head. EX1010, 9; EX2013, ¶119; EX1023, ¶46.

Stratasys also incorrectly asserts that “*KISSlicer teaches that an entire structure (“a cylinder”) is printed before every layer,*” contending that KISSlicer’s wipe pillar is therefore not printed in a layer-by-layer manner. POR, 78. If this logic were applied to the ’713 Patent, claim 1 should require printing an entire purge tower every time that a print head or deposition line is switched to the operating mode. EX1001, 15:53-58 (“performing a purge operation for *each print head or deposition line switched to the operating mode*, the *purge operation*

comprising printing at least one purge tower”). But Stratasys does not argue that claim 1 is limited in this way. KISSlicer’s description of “a wipe pillar...printed before every layer to clean the extruder tip” refers to a single purge tower printed layer-by-layer, just like the purge tower of the ’713 Patent. EX1023, ¶48.

Stratasys argues that KISSlicer’s “Wipe [mm]” setting (EX1010, 10) is unrelated to KISSlicer’s “Wipe pillar” (EX1010, 9). POR, 78-79. This is false. On KISSlicer’s user interface, there are at least two settings relating to the wipe pillar. The “Wipe Pillar” setting specifies where on the build plane the “Wipe pillar” will be printed. EX1023, ¶49.



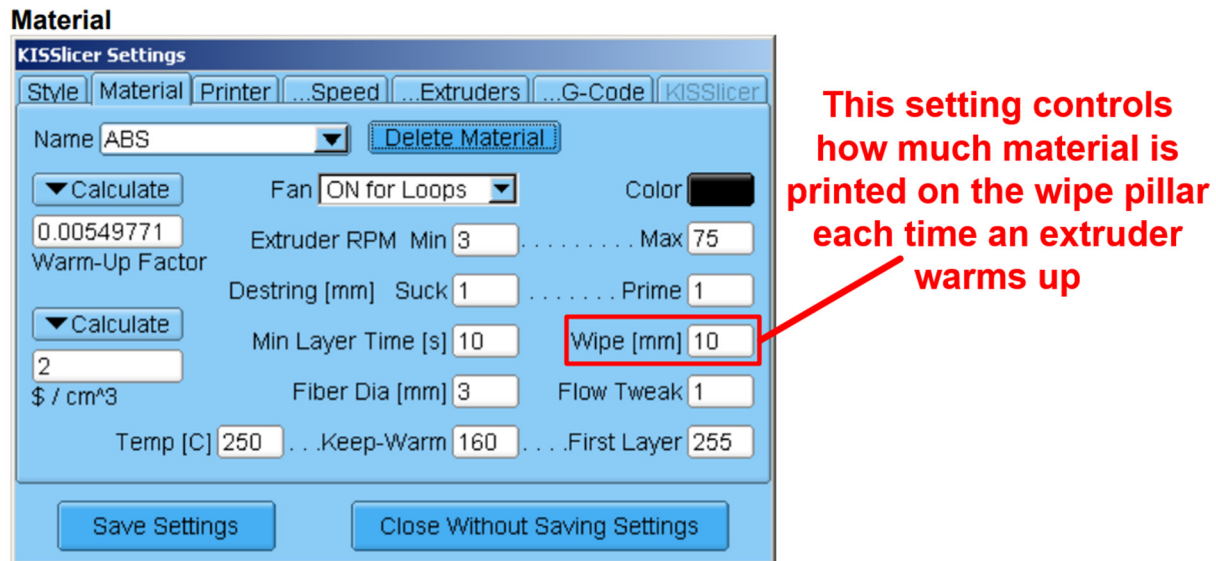
This setting controls where the wipe pillar is printed on the build surface

EX1010, 7 (annotated).

The “Wipe [mm]” setting specifies how much material the extruder will “prime” in printing the wipe pillar *after the extruder warms up*. EX1010, 3, 10;

EX1023, ¶50. The “Wipe [mm]” setting is located on the same menu as the “Temp [C]” setting and the “Keep-Warm” setting, which set the temperature of the extruder when on the operating mode and the stand-by mode, respectively.

EX1010, 7, 10.



EX1010, 3 (annotated).

KISSlicer only uses the word “wipe” to describe the wipe pillar and the two settings relating to the Wipe pillar, confirming that the wipe pillar is the result of the “Wipe [mm]” setting. EX1010, 3, 7, 9, 10; EX1023, ¶51.

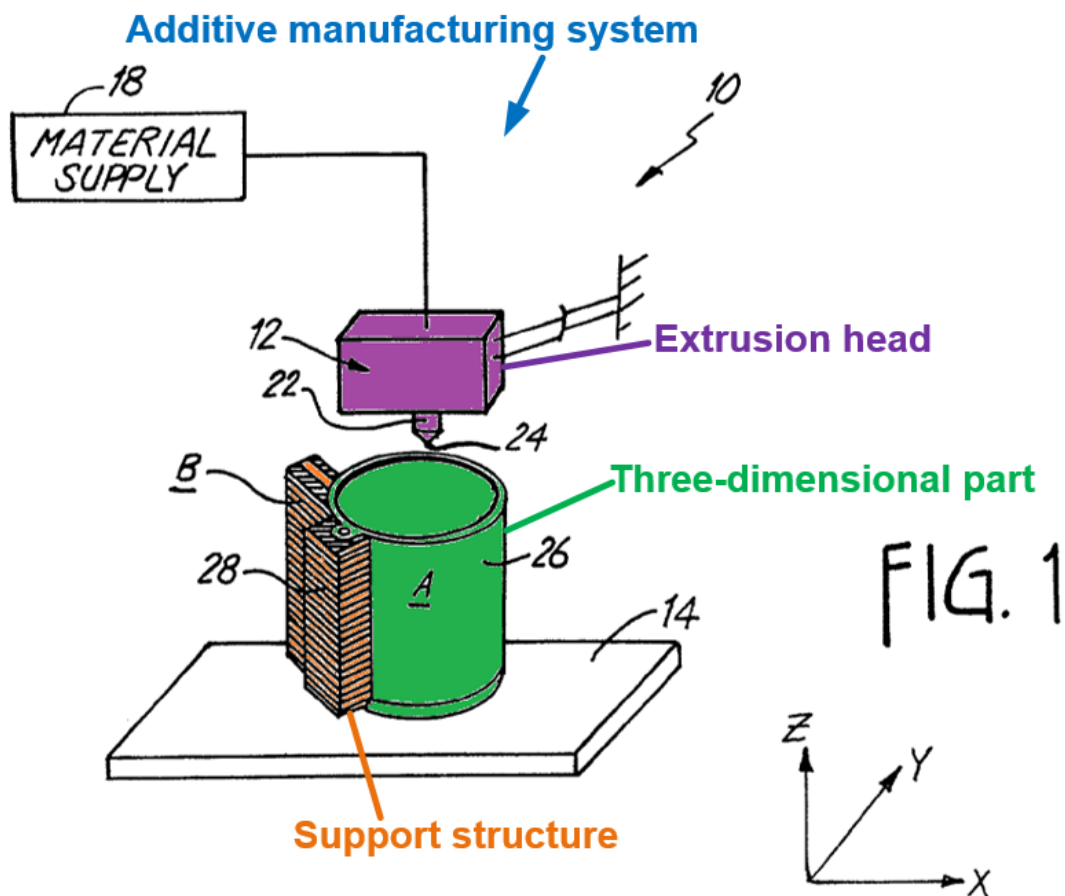
B. The Priedeman-Kisslicer Combination Provides Claim 6.

As described above, KISSlicer expressly discloses that the wipe pillar is printed “after a warm up” that occurs when an extruder transitions from idle to active. When KISSlicer explains that “[t]he wipe pillar is a cylinder printed before every layer,” a POSITA would understand that “layer” means everything that is

printed by the extruder after it comes online and until the extruder goes idle again.

EX1023, ¶52. Indeed, the entire mass of material printed by an extruder in one online session would form a “layer” on the part, and KISSlicer explains clearly that the wipe pillar is printed in a purge operation before every layer.

The example in Priedeman switches from support material (orange) to part material (green) at the top layer:



EX1007, FIG. 1 (annotated). As such, when Kisslicer is applied to this example in Priedeman, the wipe pillar “is stopped at a highest layer at which there is a material change.” EX1023, ¶¶53-55.

VII. THE PRIEDEMAN-KISSLICER-REPRAP COMBINATION RENDERS OBVIOUS CLAIM 5

A POSITA would have been motivated to combine Priedeman-Kisslicer with RepRap and the combination provides claim 5 for at least the reasons discussed above in relation to Ground 1. *Supra*, §§V.A, V.D; EX1003, ¶¶213-216. A POSITA would have been motivated to implement KISSlicer’s purge tower based on RepRap to provide a more stable and less top-heavy purge tower. EX1023, ¶¶56-57.

As discussed in §V.A, *supra*, it is not RepRap’s purge tower (“parking space”) that “slows down the print” but rather the act of switching materials (a functionality already present in Priedeman’s system). EX1005, 1. As discussed in §V.D, *supra*, RepRap’s purge tower has a cross-sectional area that reduces in height along the axis and there is no requirement in claim 5 that the purge tower never again increase in cross-sectional area. EX1023, ¶58.

VIII. BOYER ANTICIPATES CLAIMS 1, 2, 6, 7, AND 9

A. Boyer anticipates Claim Element [1a]

Boyer printer “accommodate[s] multi-material builds” and prints a “transition segment” (purge tower) when switching between materials for “any

such multi-material models” including those having both “object” and “support structure[]” material. EX1008, [0024]-[0025], [0032]-[0033], [0029], [0044]; *see also* Inst. Dec., 19, 24, 25; EX1023, ¶59.

Stratasys improperly focuses on the specific example of Boyer’s FIG. 4. POR, 84-88. However, Boyer is explicit that FIG. 4 “is provided for purposes of illustration only” and that its teachings are not limited to “the geometric pattern” depicted in FIG. 4., while contemplating patterns with exterior excursions (transition segment purge towers) rather than infill. EX1008, [0034]; EX1023, ¶¶60, 62.

Stratasys’s arguments improperly focus on the specific geometric shape of the example of FIG. 4, rather than properly analyzing Boyer with respect to “all that [it] disclose[s]” to a POSITA. *Alivacor, Inc. v. Apple Inc.*, 130 F.4th 1006, 1015 (Fed. Cir. 2025). Boyer’s disclosures are clear: (1) a “transition segment” (purge tower) is printed when switching materials, (2) the materials include object and support material in at least some implementations, and (3) Boyer’s printer “deposit[s] successive layers of material” to form the disclosed structures (e.g., a layer-by-layer manner). EX1008, [0032]-[0033], [0044], [0018]; EX1023, ¶¶61, 63-64. Even if Stratasys’s assertions that the specific geometric shape shown in FIG. 4 is not ideal for use with sacrificial support structure material were true

(which Stratasy's has not established), such an argument does not negate the express disclosures of Boyer that provide all elements of claims 1, 2, 6, 7, and 9.

FIG. 1, depicting a different shaped object than FIG. 4, demonstrates that Boyer's disclosures are not restricted to a specific geometry.

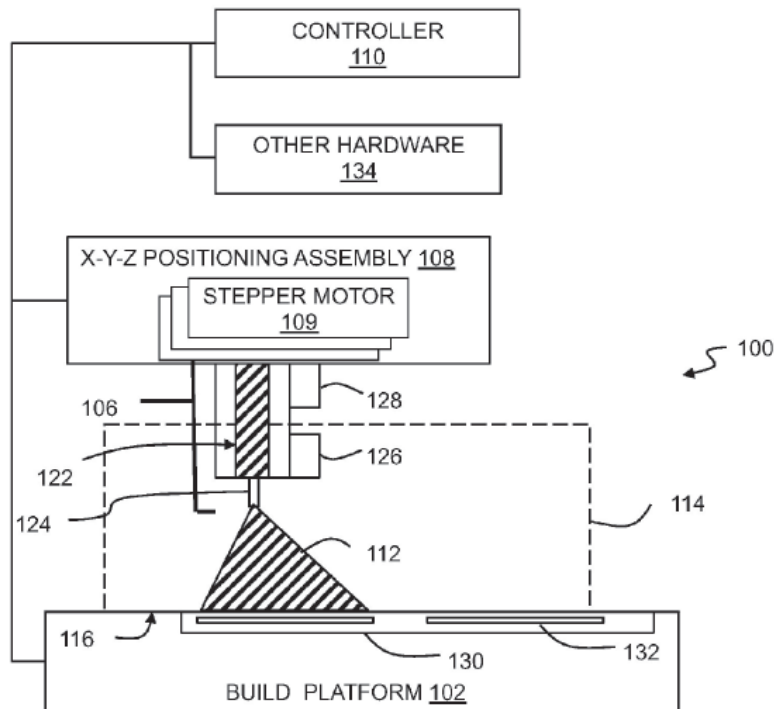


Fig. 1

EX1008, FIG. 1; EX1023, ¶62.

B. Boyer anticipates Claim Element [1c]

As discussed in §II.B, *supra*, the claims do not exclude any contact between the purge tower and part. EX1023, ¶¶65-66. For this reason, Stratasy's Element [1c] arguments fail.

Every time that Boyer's extruder transitions to a new material, the extruder performs a purge operation by printing a "transition segment" that is "sacrificial material" rather than part of the object itself and thus a purge tower rather than part of the three-dimensional part being fabricated. *Id.*, [0032]-[0033], [0040], [0043] ("...sacrificial material deposited ***outside the exterior of the object***"). Through the object and transition segments "by depositing lines of build material in successive layers," the printer deposits transition segments in successive layers to form a purge tower. EX1008, [0032]; EX1023, ¶¶67-69.

While it is true that separately listed claim elements are "distinct components" (POR, 91-92), Boyer satisfies this requirement. Being "distinct components" does not preclude all physical contact. Indeed, the "three-dimensional port" and "support structure" of claim 1 are recited independently yet Stratasys's expert testified that these different components would generally be in contact. EX1025, 35:18-37:6. Boyer's disclosure that the transition segments (purge towers) are "***sacrificial material deposited outside the exterior of the object***" reveals that they are separate components that may or may not contact the object itself. EX1008, [0043].

Respectfully submitted,

Dated: December 17, 2025

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CERTIFICATION UNDER 37 CFR §42.24

Under the provisions of 37 CFR § 42.24(d), the undersigned hereby certifies that the word count for the foregoing Petitioner's Reply to Patent Owner's Response totals 5,589 words, which is less than the 5,600 allowed under 37 CFR § 42.24(c)(4).

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CERTIFICATE OF SERVICE

Pursuant to 37 CFR § 42.6(e)(4), the undersigned certifies that on December 17, 2025, a complete and entire copy of this Petitioner's Reply to Patent Owner's Response to Petition and Accompanying exhibits were provided by email, to the Patent Owner, by serving the email correspondence address of record as follows:

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