UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SHENZEN TUOZHU TECHNOLOGY CO., LTD.,

Petitioner,

v.

STRATASYS, INC.,

Patent Owner.

Case IPR2025-00438 (US Patent No 10,569,466)
Ref. 56224-0010IP1

VIDEOCONFERENCE DEPOSITION OF

DENIS R. CORMIER

MARCH 25, 2026

Page 1 - 88 **9:58 a.m. - 1:31 p.m.**

REPORTED BY:
Tamara L. Houston
CA CSR No. 7244, RPR, CCRR No. 140, CRG
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VIDEOCONFERENCE DEPOSITION OF DENIS R. CORMIER, taken on behalf of the Petitioner, commencing from 9:58 a.m. to 1:31 p.m. EST, Wednesday, March 25, 2026, before Tamara L. Houston, CSR No. 7244, CCRR, RPR, CRG.

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E X H I B I T S

*** REFERENCED ONLY ***

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WEDNESDAY, MARCH 25, 2026, 9:58 a.m.

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COURT REPORTER: My name is Tamara Houston, California Certified Shorthand Reporter Number 7244.

DR. DENIS R. CORMIER,

having been called as a witness,

who was thereupon examined and testified as hereinafter set forth:

EXAMINATION BY MR. BISENIUS:

Q. Good morning, Dr. Cormier.

Today, we are discussing IPR proceeding IPR 2025-00438 regarding U.S. Patent Number 10,569,466.

Do you understand that you are under oath?

A. Yes, I do.

Q. Is there any reason that you cannot give truthful and accurate testimony today?

A. No, I don't believe so.

Q. For true clarity, I will define several terms that we'll use throughout this deposition.

When I use the terms "patent owner" or "Stratasys," I'm referring to Stratasys, Inc., the patent owner in this proceeding.

Do you understand?

A. Yes, I do.

Q. When I use the term "Petitioner" or "Shenzhen

Tuozhu," I'm referring to Shenzhen Tuozhu Technology Company Ltd.

Do you understand?

A. Yes, I do.

Q. When I use the term "the '466 patent," I'm referring to U.S. Patent Number 10,569,466.

Do you understand?

A. Yes, I do.

Q. When I use the phrase "this IPR" or "this proceeding," I am referring to IPR Proceeding Number IPR 2025-00438 filed against the '466 patent.

Do you understand?

A. Yes, I do.

Q. And you understand that the '466 patent is Exhibit 1001 in this proceeding, correct?

A. That's -- yes, that's my recollection.

Q. When I use the acronym "POSITA," I'm referring to a person of ordinary skill in the art at the time of the alleged invention.

Do you understand?

A. Yes, I do.

Q. Your declaration in this proceeding is Exhibit 2013 signed on January 16th, 2026.

When I use the term "your declaration," I'm referring to Exhibit 2013 in this proceeding.

Do you understand?

A. Yes, I do.

Q. Can you please describe how you prepared for today's deposition?

A. Sure.

So I read materials that were provided to me.

I took plenty of notes.

We had meetings with -- with McDermott and myself. We had Zoom meetings and discussed what my positions were.

And then there was essentially a team effort to prepare the written document, which I then did final editing of and signed off that it was my opinion.

Q. Roughly how much time did you spend preparing your declaration for this case?

A. That was -- that was a couple months ago. So I'm guessing it was probably somewhere between 20 and 30 hours, if I had to take a guess.

Q. In preparing your declaration, did you communicate with anyone other than counsel for the patent owner?

A. No, I did not.

Q. Approximately how much time did you spend preparing for today's deposition?

A. I would guess 10 to 15 -- 15 hours, maybe.

Q. As part of preparing for today's deposition, did you communicate with anyone other than counsel for the patent owner?

A. No, I did not.

Q. What documents did you review in preparation for your deposition today?

A. The -- well, the references that were provided to me, including -- so there was the list of patents that were provided as references. There was Professor Hickner's declaration. The -- the preliminary board decision.

Those are the ones that are coming to mind right off the top of my head. Obviously all the files are closed on my computer, so I don't have the list of documents. I'm going off of memory here.

Q. In preparing for today's deposition, did you review any documents that are not currently of record in this proceeding?

A. I -- so there is -- there is an example of a figure that -- I inserted one of the figures that are inserted into my declaration for the binder jetting process, for instance, that I used as supporting information for my position.

Q. I'm going to drop your declaration, Exhibit 2013, into the chat.

Hoping you can identify the figure that you were just referring to.

(Exhibit 2013 was referenced.)

THE WITNESS: Sure.

Hasn't arrived in the chat. Oh, there it is. Okay. Give me one second to open that.

Hang on. It's trying to download it instead of opening it.

Oh, I guess I do have to download it. Okay. One more second here.

Okay. Okay. I have the file open, and give me one second here to scroll down and locate that.

Okay. It looks like it's page 68. There's an illustration of a binder jetting process there.

BY MR. BISENIUS:

Q. You're referring to the image from Exhibit 2014 (sic), correct?

A. That appears to be correct, yes.

Q. When were you first contacted by someone on behalf of Stratasys to work on the current set of cases involving Stratasys and Shenzhen Tuozhu?

A. Let's see. We're in 2026. This -- I want to -- it was -- I'm guessing it was early 2025, in that approximate timeframe.

Q. Do you recall who first contacted you on

behalf of Stratasys?

A. I believe it was Aashish Kapadia -- is that how -- I don't remember how to pronounce or spell his last name, but it's close to that.

Q. As part of your work on this case, have you communicated with anyone at Stratasys?

A. Did you say in preparation for this? I didn't hear the first part of the question.

Q. Yeah. In preparing your --

A. Oh.

Q. -- declaration and preparing for the deposition today, have you communicated with anyone at Stratasys?

A. No, I have not.

Q. Had you heard of Stratasys prior to being engaged with these cases?

A. Yes.

Q. When did you first become familiar with Stratasys?

A. The late '90s, I purchased a machine from them. So it's been over 20 years now. Almost 30 years.

Q. When did you first become aware of the '466 patent?

A. It would have been the same time that Aashish, or Mr. Kapadia, reached out to me. I had not read that

patent prior to him reaching out, to the best of my recollection, at least.

Q. As part of your work on this IPR proceeding, did you communicate in any way with any of the named inventors of the '466 patent?

A. No.

Q. Other than counsel for the patent owner, did you have anyone, such as an assistant, help you with your declaration for this IPR?

A. No, just me.

Q. Has anything happened to change any of your opinions that you provided in your declaration for this case?

A. None that I can think of.

Q. Are you currently aware of any errors that exist in your declaration?

A. None that I'm aware of. I won't -- if I read it again and again, I won't swear that I haven't missed anything, but none that I'm aware of.

Q. During your career, approximately how many times have you been retained as an expert either in litigation or IPR matters?

A. Once before, plus this one.

Q. During your career, approximately how many times have you been deposed as an expert in litigation

or IPR matters?

A. This is my third time being deposed.

Q. Prior to reading the expert declarations submitted by Dr. Michael Hickner in this case and the other related IPR proceedings, did you know Dr. Hickner?

A. No. I -- it's entirely possible that we just met in passing at conferences, but I don't have an explicit recollection of ever meeting him in person or communicating with him via e-mail or anything.

Q. All right. We already have your declaration open, Exhibit 2013. I want to turn to paragraph 12 of your declaration.

A. Okay. One second.

Okay. I see it.

Q. In paragraph 12, you state that you've taught classes in additive manufacturing/3D printing.

What different types of additive manufacturing processes did those courses cover?

A. Pretty -- pretty much all of them. The introductory preprinting course is a survey -- that's the one that I've been teaching for a very long time, 25 years or more. That course covers all of the basic processes such as fused filament fabrication, binder jetting, laser sintering, and so on.

Q. Can you briefly describe the binder jetting

process?

A. Sure.

So binder jetting is a powder-based process where you have a container or a platform and you spread a very thin layer of powder over -- over the build platform, and then an inkjet printhead passes over the powder layer and selectively jets droplets of ink, or you can think of them as glue, that bind the particles together only where you need them held together within that one layer.

And then you spread another layer on top of the first and repeat the process one layer after another until the three-dimensional shape has been produced.

And then at the end of that, you remove the bound part or three-dimensional shape from the powder bed and blow off any remnant powder that's sitting on the surface.

Is that a sufficient description?

Q. Yes. Thank you.

A. Okay.

Q. In binder jetting processes, are there certain temperature requirements for the process, such as temperature for the -- temperature for dispensing material, build platform temperature, build volume temperature, et cetera?

A. There -- there can be. So if you need the -- if the binder that I alluded to is being printed, in certain instances, you might have to heat up the ink to a temperature that makes it jettable. Compatible with the inkjet printing process.

In some cases, you might -- you might apply heat to the powder bed after you printed to help dry the -- dry the fluid and so on.

Q. Are there cooling requirements for binder jetting?

A. I -- in my professional experience, I don't recall actively cooling, like blowing cold air or anything or having chillers. You will -- when you're done printing, you turn off all the heat, if there is any heat applied, and it would naturally cool down. But I don't recall active cooling with chillers or things like that.

Q. The temperature requirements that you just discussed, such as a jetting temperature, would those temperatures vary based on the material used in the process?

A. They -- generally speaking, you would -- they're ink specific, so -- so you might have to -- so you might change the temperature as you're printing.

Depending on which ink you're printing, you

might -- if there is closed-loop process control where you're monitoring whether or not droplets are coming out, you might dynamically raise or lower temperatures as the process progresses.

Q. Can you briefly describe the laser sintering process?

A. Yes.

So in laser sintering, it's, again, a powder base where it starts out with a powder and a platform. So you spread -- you know, a doctor blade will spread a thin layer of powder typically inside of plastic or metal over the build platform.

And then a laser from above points down and scans over the surface of the powder, and anywhere the laser scans over the surface of the powder, it melts the powder. And that's the selective part. You selectively melt some powder and not other areas.

And then repeat the process, and pull your part out of the powder when you're done.

Q. Would laser sintering processes have temperature requirements, such as a platform or build volume temperature requirement, for a temperature achieved by the laser?

A. So it's an indirect thing where the laser power and speed will determine the temperature of the

material that you're melting. And, you know, as a general rule there, you want to get the temperature up above a certain value to get proper melting.

Again, that -- that value will change as -- as the build progresses, so you may increase or decrease laser power or speed. It's not a static number just because the part is accumulating heat as you're growing the part.

Q. Can you briefly describe the fused filament fabrication process?

A. Yeah.

So fused filament fabrication, that's the -- for the general public, when you say "3D printing," that's the process that most people are familiar with.

So you have a plastic wire -- it's kind of like Weedwacker wire -- that you feed into a heated nozzle. I call it a very expensive hot melt glue gun.

And so you melt -- melt the plastic, and the melting -- the plastic gets pushed out of a nozzle, and the nozzle moves over a print bed.

And so that plastic that's continuously coming out of the nozzle will lay down a bead plastic, and you do that over and over and over again to build up the three-dimensional shape.

Q. You mentioned melting the plastic. Would

different types of plastic material have different melting temperatures in the fused filament fabrication processes?

A. Yes. Each -- each plastic has its own melting temperature.

Q. So would using different materials require different temperatures for the extruder nozzle?

A. Yes. You would extrude different materials at different temperatures, and also the temperature will change -- excuse me, the temperature will change while you're printing as well. It's not one static number. As a general rule, that is.

Q. Do fused filament fabrication processes ever include other temperature requirements, such as build platform temperature or build volume temperature requirements?

A. Yes, you will -- optional depending on which machine you're using, but if a machine is equipped with a print bed heater and/or a chamber heater, then you could -- you could use those during the printing process.

Q. Would those temperature requirements be changed based on the type of material used?

A. Yes, they would. Well, they could, at least, I'll say.

Q. Are there cooling requirements for fused filament fabrication processes?

A. Yes. For that process in general, it's not uncommon to have a fan that blows on the material that you've squeezed out of the nozzle to help it cool down and solidify more quickly.

Q. Would those cooling requirements change based on the material used?

A. They -- they could. Yeah.

Q. Sticking with paragraph 12 of your declaration, towards the end of the paragraph, you mention 3D printing of metallic components.

At the time of the '466 patent, what processes were available to a POSITA for 3D printing of metallic components?

A. So the -- the most commonly known one at that time was laser powder bed fusion. There's electron beam melting. There is what we call metal binder jetting. And directed -- I'm sorry, directed energy deposition.

Those would be examples of metal 3D printing processes.

Q. How does laser powder bed fusion differ from the laser sintering process you mentioned earlier?

A. So you start getting into trademarks and things like that. So different names for the same

thing.

But also laser sintering, as a high-level, generic term, could also be used to describe melting plastic powder instead of metal powder. So laser powder bed fusion usually -- not globally but -- the typical meaning of laser powder bed fusion is interpreted to mean for making metal parts.

Q. Did you cover any of the processes that you just mentioned for 3D printing of metallic components in the classes that you taught?

A. Yes. The intro class as well as -- well, actually, I'm sorry. As of 2012, I had not taught a metal additive manufacturing course. But, yes, in the generic 3D printing or the intro 3D printing course, I covered those processes.

Q. Can you briefly describe the directed energy deposition process?

A. Sure.

So there are two variants of it. If -- if you imagine a laser -- shooting a laser down onto a plate of metal, it melts a little spot on the metal plate. And so you have what's normally called a puddle, a melt puddle. Odd name for molten metal, but that's what people call it.

And then from the side, you would either blow

in metal powder or you could feed in a wire so you're adding metal to the little puddle there, and then you start moving. And so you're laying down a bead of additional metal in whatever path you follow.

And then obviously keep doing that to build up the three-dimensional shape.

Q. Would there be temperature requirements for the directed energy deposition processes, such as platform temperature or build volume temperature?

A. It's -- it's not common to control the build volume temperature with that process. There are instances where people will heat or even sometimes cool the build platform, though, that you're printing onto.

Q. Can you briefly describe the electron beam melting process?

A. Sure.

So it's identical to the laser powder bed fusion process that I described with the exception -- or it's, generally speaking, identical, with the exception that you're using an electron beam instead of a laser as the energy source to melt the metal powder.

And it only applies to metals. Unlike lasers, you would not use an electron beam to melt ceramic materials, for example. Just metallic materials.

Q. I want to talk about the '466 patent,

Exhibit 1001. I'm going to drop that into the chat.

A. Okay.

(Exhibit 1001 was referenced.)

THE WITNESS: Downloaded it, but it's --

There it is. Okay.

Okay. I have the '466 patent open.

BY MR. BISENIUS:

Q. I want to start at the very bottom of Column 1 with the sentence that starts at line 66.

A. Okay. I see it.

Q. Here, the '466 patent states: (As read) "The following description emphasizes three-dimensional printers using Fused Deposition Modeling or similar techniques where a bead of material is extruded in a layered series of two-dimensional patterns or 'roads,' 'paths,' or the like to form a three-dimensional object from a digital model."

Is this Fused Deposition Modeling technique described here the same as or different from the fused filament fabrication process you mentioned earlier?

A. It's similar to -- again, Fused Deposition Modeling was a trademark term for the process, and fused filament fabrication is the generic term. It's kind of like tissues and Kleenex. Kleenex is a trademark name. It's a similar thing here.

Q. So a POSITA would consider Fused Deposition Modeling to just be a variety of fused filament fabrication; is that correct?

A. Generally speaking, yes.

Q. So the temperature requirements you described earlier, such as material dispensing temperature, build volume temperature, et cetera, for fused filament fabrication processes, those would apply equally to Fused Deposition Modeling; is that correct?

A. Yes, that's generally correct.

Q. All right. Continuing with the same paragraph, now on Column 2, the '466 patent states: "Numerous additive fabrication techniques are known in the art, including, without limitation, multi-jet printing, stereolithography, digital light processor ('DLP'), three-dimensional printing, selective laser sintering, and so forth."

Do you see that?

A. I do.

Q. Is multi-jet printing the same as or different than the binder jetting printing that you mentioned earlier?

A. It's a different process.

Q. Can you please briefly describe the multi-jet printing process?

A. Sure.

So with multi-jet printing, it's -- it's an inkjet process where the -- and this is as a general rule, the typical implementation. It's an inkjet process where the ink being printed is a liquid plastic, and so you have liquid plastic being jetted out of the print head nozzles.

When the liquid plastic lands on the substrate, it's -- it either solidifies -- it solidifies by one method or another. You might shine an ultraviolet light on it or other curing methods. And then you've printed one layer, so then you print the second layer and the third layer and so on.

So that's in contrast to binder jetting where there was powder -- powder material. You were jetting glue to hold the particles together.

Q. Would different liquid plastic materials used in multi-jet printing have different temperature requirements, such as dispensing temperature, platform temperature, or build volume temperature?

A. They -- well, just to be clear, the dispensing temperature, that term generally refers to a different process. But if you use the term "jetting temperature," for instance, that would be more appropriate for that process.

And so depending on what kind of liquid plastic you're -- you're jetting, you might choose to use a different temperature during printing. And as was the case before, that -- that's not necessarily a static temperature. It can change depending on the print conditions and where you are.

Q. Would that be different temperatures for the jetting of the material, the platform temperature, and the build volume temperature?

A. It -- it's -- it can be, yes.

And I'm sorry -- you did mention build volume temperature; is that correct?

Q. Correct.

A. Okay. Yeah. Generally -- generally speaking, in multi-jet printing, there is not a -- you don't specify or use a build volume temperature. That's used for other processes but not -- not that specific process, generally speaking.

Q. Are there cooling requirements for multi-jet printing?

A. I cannot think of -- in my professional experience, I cannot think of any multi-jet printing system that I've ever used or seen that had active cooling of any sort. I wouldn't rule it out globally, but my professional experience, I don't recall active

cooling.

Q. Other than the temperature requirements that we just discussed, are there other operating parameters for multi-jet printing that would change based on the type of liquid plastic used?

MR. TATUM: Objection. Form.

THE WITNESS: I have to think about that for a second to see if I can come up with examples.

You said other -- other printing parameters that would change based on the material used; is that correct?

BY MR. BISENIUS:

Q. Correct.

A. Okay. So the -- we're getting into the weeds here that -- that -- a POSITA wouldn't be familiar with this, but getting into the weeds, when you operate an inkjet print head, there's a voltage signal that you send to each of the nozzles that determines how much energy you -- you apply to push the plastic out of the nozzle, the discrete droplets.

And so that voltage could vary depending on which -- which material you're trying to jet. Just some materials require more energy to get the droplets to fly.

But that -- that could be one example.

Q. Can you please briefly describe stereolithography?

A. Sure.

So stereolithography is widely credited as being the first 3D printing process. And so you -- in that case, you have a vat or a container filled with the liquid plastic -- or resin, it's called -- and then you have a laser from above that shines down onto the top surface of that liquid plastic, and the laser moves around a prescribed path.

And anywhere the laser impinges upon that liquid plastic, it selectively hardens where it converts the liquid to a solid. And then you lower the build platform and another layer of liquid plastic, and you repeat the process and then clean -- clean all the goop off of your part when you're done.

Q. Would there be different temperature requirements for different types of liquid plastic used in these processes, such as temperatures for the build volume or temperatures reached by the laser?

A. For the laser, I don't think -- so this particular process does not use heat to cure the material -- or to harden the material. It's a chemical reaction rather than heat.

And so the -- the only temperature requirement

that might come into play here -- and I'm trying to think prior to -- well, 2012 or earlier, I -- I'm not sure if there were -- if there were resin vat heaters prior to -- well, 2012 or earlier, let's say.

Modern versions of this process can have heaters of the resin vat to -- and that temperature might vary depending on which material you're -- you're printing.

I -- I couldn't swear to you that that was in place prior to -- I'm sorry -- 2012 or earlier. It may or may not have been.

Q. Can you briefly describe digital light processor three-dimensional printing?

A. Sure.

So it -- if you're standing there, watching it, it looks kind of similar to the stereolithography process that we just talked about in that you have a container of liquid -- liquid plastic. Instead of a laser that shines down and, you know -- it's just kind of a point source, like a laser pointer if you were to draw shapes on the wall that your cat chases. Right?

With DLP, it's the same DLP projectors that are in classrooms that project an image from a computer onto a -- onto a screen. The light from that DLP projector will selectively harden the plastic. So if

you were to project an image of a white square onto the liquid plastic, it would harden a square in that area.

From that point forward, it's just do another layer of liquid plastic, project the next image, and so on.

Q. So the area that's cured or hardened is based on the color of the light projected on it; is that correct?

A. It's based on the wavelength specifically, the scientific term. So if you're -- 465 nanometers, for instance. The liquid plastic is chemically tuned to harden at a very narrow range of wavelengths. And that's the same case with stereolithography.

Q. This paragraph in the '466 patent uses the term "selective laser sintering."

Is that the same as the laser sintering process you discussed earlier?

A. It -- it's -- it's similar. And, again, so -- and, again, these are not universal. Different people will use terms a little bit differently.

But the majority of people, I would say, use the term "selective laser sintering" when they're describing melting plastic powder, whereas "laser powder bed fusion" is more commonly used to describe metal -- melting metal powders.

The process is operating essentially in the same manner. Spread a layer of powder and scan a laser beam over the powder.

Q. I want to continue with the '466 patent.

And going towards the end of Column 4, starting at line 57, it states: "Figure 2 depicts a networked three-dimensional printing environment."

How does a networked three-dimensional printing environment differ from a non-networked three-dimensional printing environment?

A. So a non-networked -- well, I can give you an example of a non-networked three-dimensional printing environment in which you might have a three-dimensional printer, you might have a PC or a computer that's connected to the 3D printer, and that --

I'm sorry, I'm just rereading that sentence just to make sure I'm answering your question here.

So, yes, it is not necessary to have a network with data or information flowing over a network to operate a 3D printer, I guess is what I'm trying to say.

And I just gave an example of that.

Q. Okay. So you just gave an example where you might have a PC or other computer directly connected to a 3D printer.

If you took the same PC or desktop computer

and had it communicate with the 3D printer over the Internet, would that be a networked three-dimensional printing environment?

A. Over the Internet. So, yes, I would describe that as a -- if you're considering the Internet to be an element of a network. It's -- I wouldn't say that it's common, but normally the term "network" in 3D printing refers to an Ethernet, for instance.

Q. Continuing with this part of the '466 patent, at the top of Column 5, it describes that the network could be a public network such as the Internet.

Do you see that?

A. I do, yeah.

Q. So would you consider situations in which a PC is communicating with a 3D printer over the Internet to fall within the '466 patent description of a networked three-dimensional printing environment?

A. As -- as it's described in the previous -- at the bottom of Column 4 that you were just saying, that would be an example of that, yes. It says the term "public network such as the Internet."

Q. The specific networked three-dimensional printing environment shown in Figure 2 of the '466 patent includes a number of devices and components in addition to the three-dimensional printers; is that

correct?

A. I -- so I just scrolled to Figure 2. I would have to -- I'd have to go back and refer to the numbers. So please repeat the question. It refers to a number of different -- what was that?

Q. A number of different devices and components in addition to three-dimensional printers.

A. Okay. Yes. The -- that particular figure shows a whole bunch of devices and components in addition to what -- looks like 204 is the 3D printer or -- well, two 3D printers.

Q. So going back to the bottom of Column 4, in the paragraph starting at line 57 that I was discussing earlier, in the third sentence of that paragraph, starting at line 60, this mentions other devices involved in the networked three-dimensional printing environment include "client devices, print servers, content sources, and mobile devices"; is that correct?

A. Yes, that's what the language says there.

Q. Moving to Column 5, the paragraph that starts at line 40, this paragraph is still discussing the networked three-dimensional printing environment of Figure 2; is that correct?

A. It's referring to numbers in the 200s, so, yes, that appears to be referring to Figure 2.

Q. This paragraph mentions that the client devices can be any number of computing devices, such as "desktop computers, laptop computers, network computers, tablets, or any other computing device that can participate in the environment 200"; is that correct?

A. It does say that, yes. Lines, roughly, 42.

Q. So earlier when you mentioned that, in non-networked three-dimensional printing environments, there would usually be a computer in communication with the printer, if you were to take that same computer and place it into the networked three-dimensional printing environment of Figure 2 and have it communicate with the printer over the network, that same computer could serve as one of these client devices; is that correct?

MR. TATUM: Objection. Form.

THE WITNESS: Let me understand your question one more time. So you said the --

So, for instance, the scenario that I was -- the common scenario that I described earlier is you have, for example, a computer sitting next to the 3D printer, and it's plugged into the 3D printer, typically over a USB -- USB cable. So you're -- in that context, can you repeat the question?

BY MR. BISENIUS:

Q. Yes.

Would you be able to use that same computer as one of the client devices in the networked three-dimensional printing environment of Figure 2?

A. It -- you don't think of it as -- so I guess I'm having a hard time answering the question. You -- you --

In the context of using a 3D printer, the -- a PC that's directly connected to the printer is typically considered part of the 3D printing system, as opposed to a client -- as opposed to a client that's remote. My office, for instance, has a PC, and I would send jobs over -- over the network.

I'm sorry, let me jump back to the -- we were -- we were in Column 5; is that correct?

Q. Yeah. The paragraph that starts at line 40.

A. There we go. Okay.

Yeah. So the function that's described here is any device "within the environment operated by users to initiate, manage, monitor, or other" -- I'm sorry -- "otherwise interact with print jobs at the three-dimensional printer."

And so it -- so if it's performing those functions, then as it -- as described there, it could serve the function of a client device if it's performing those functions.

Q. I want to continue to the paragraph starting at line 3 of Column 6.

This paragraph is still discussing the networked three-dimensional printing environment of Figure 2; is that correct?

A. And I'm sorry, you said paragraph 3? So is that line 59?

Q. I'm sorry, line 3. Line 3.

A. Line 3. Okay. Sorry.

Q. Okay. I'll repeat my question.

This paragraph is still discussing the networked three-dimensional printing environment of Figure 2; is that correct?

A. It appears to be because the numbers are labeled in the 200s, yes.

Q. This paragraph is discussing the multiple print servers in the network; is that correct?

A. It -- it starts alluding to the print servers, so that appears to be correct.

Q. This paragraph describes that the print servers can manage a print job received from one or more client devices and distribute print jobs to the printers; is that correct?

A. I'm just trying to find the part -- the portion of the sentence where it says "distribute jobs

to the 3D printers."

Q. Maybe I can ask this a different way.

A. Sure.

Q. How would you describe the function of the print servers 208 in the network?

A. Sorry, I just lost my -- lost my place here.

So we're on Column 6, correct?

Q. Correct.

A. For answering your question. Yeah.

So -- yeah, so it says: "For example, the print servers may manage print jobs received from one or more of the client devices and provide related supporting functions such as content search and management."

So that -- and then it also says: "A Web server that provides Web-based access by the client devices to the capabilities of the" -- "of the print server."

And it may communicate periodically with the 3D printers to get the status of the printers.

So those are all examples of functions of a server that it explicitly lists there.

Q. The '466 patent also describes that the print servers select printers to complete the received print jobs; is that correct?

A. Can you -- I can search. Can you tell me where you're reading from? What do you want me to search for?

Q. It's not a direct quote --

A. Oh, okay.

Q. -- but it's around line 22 of Column 6.

A. Okay. And -- and apologies one more time. Can you repeat the question?

Q. Would you agree that the '466 patent describes that the print servers select printers to complete the received print jobs?

A. So line 24, it appears, it says a print server may automatically select one of the three-dimensional printers for a user-submitted print job.

Q. Okay. The description of the functionality of the print servers continues into columns 7, 8, and 9; is that correct?

A. Yes. That appears to be correct per the top of Column 9.

Q. In this network environment described with respect to Figure 2, do the print servers themselves have any three-dimensional printing capability? In other words, are they capable of fabricating three-dimensional objects themselves?

A. I could -- I could take the time to read all

of that. I'm -- I can say that I do not recall ever seeing a print server having any connection -- or print server being used to 3D print a part. A print server is generally a computer, not a 3D printer, if that's what you're getting to.

Q. So generally around this timeframe, 2012 and earlier, in general, in a networked printing environment, would you agree the function of a print server is to receive print jobs from client devices and send those print jobs to printers?

MR. TATUM: Objection. Form.

THE WITNESS: So the 2012 timeline -- I'm trying to think of -- so since 2012, what you just said for sure is -- it has been done by different software packages.

I'm trying to think -- I'm trying to come up -- if I can remember any examples of print servers being used that way 2012 or earlier. Prior to this -- prior to this patent. I --

So, again, I can't give you an absolute or a definitive, "Yes, this happened"; "yes, this did not happen."

I do not have any memory of print server -- I'm sorry -- 3D printer server software doing this 2012 or earlier.

So I couldn't give you a definitive "yes" or "no" answer to that question.

BY MR. BISENIUS:

Q. Sticking with Column 9, looking at the paragraph that starts at line 25.

A. Okay.

Q. This paragraph is still discussing the networked three-dimensional printing environment of Figure 2; is that correct?

A. It appears to be, yes, referring to 200-numbered items, yep.

Q. This paragraph is discussing the content sources 210, correct?

A. Yes, I see reference to that.

Q. What is the function of the content sources 210?

A. So the examples that it's giving there are sources of content for fabrication with the 3D printer -- "databases of objects accessible through a Web interface."

So the -- it's kind of what the name implies. It's a source of content -- well, it's a circular description there, but a content source is a place where you could get things that you want 3D printed, I guess, is the crude way of describing it.

Q. Moving on to Column 10, the paragraph that starts at line 4, this paragraph is still discussing the networked three-dimensional printing environment of Figure 2; is that correct?

A. It appears to be, yes.

Q. What function do the mobile devices 212 serve in the networked printing environment of Figure 2?

A. So as described there, the mobile device can interact with the networked printing environment, which could be interacting with a laptop computer, tablets, et cetera; may be operated by users for user-oriented functions such as to locate printable objects, submit objects for printing, and to monitor a personally owned printer.

Those would be examples that address your question.

Q. So do the mobile devices 212 function as client devices?

A. So in the sense that it says to submit objects for 3D printing, that could be an example of -- you might consider that an example of the functionality of a client that wants to submit something for printing.

Q. Continuing on to columns 11 and 12, these two columns are still discussing the networked three-dimensional printing environment of Figure 2; is

that correct?

A. That appears to be correct. All the numbers I see are in the 200s.

Q. In Column 13 at line 65, the '466 patent begins discussing Figure 3; is that correct?

A. Yes, that's correct.

Q. So would you agree that the portion of the '466 patent starting at Column 4, line 57, and continuing until Column 13, line 64, is describing a networked printing environment?

A. Say the start -- the start column again.

Q. Column 4, line 57.

A. Okay. Do you want me to read it?

And then I know you said through the bottom of Column 13. Right?

Q. Correct.

A. Okay. Yeah, so --

Q. And the question was: Would you consider this portion of the '466 patent from Column 4, line 57, until Column 13, line 64, to be describing a networked printing environment?

A. At least portions of it do. I'd have to read all -- whatever -- these four pages or so, but -- portions of it refer to networked printing, not necessarily the entire range that you mentioned.

MR. BISENIUS: I'm about to switch to a different exhibit, and we've been going for about an hour. So now might be a good time for a break.

THE WITNESS: Sure.

MR. BISENIUS: Should we reconvene at ten past?

THE WITNESS: Sure. That works.

(Recess: 11:03 a.m. to 11:10 a.m. Eastern Time.)

MR. BISENIUS: I've dropped Exhibit 2014 into the chat.

(Exhibit 2014 was referenced.)

THE WITNESS: Okay. I've got it.

BY MR. BISENIUS:

Q. You briefly mentioned Exhibit 2014 earlier today when discussing the figure on page 68 of your declaration. So I want to talk about some of the disclosures in Exhibit 2014.

A. Okay.

Q. Specifically I want to start on page 3.

A. PDF page 3, correct?

Q. Correct. PDF page.

A. Okay. Got it. Sorry.

Q. Under the subheading 4, "Details of RP Technologies," in the second paragraph, it states: "At

present, the prototyping technologies are based on the following five main manufacturing processes."

Do you see that?

A. Yes, I do.

Q. What 3D printing technologies would fall under the curing process?

A. Curing process -- so stereolithography -- sorry, I almost gave the wrong acronym there. So stereolithography is one. The -- Excuse me -- direct light fabrication.

And, again, you have to understand that people -- this is a rapidly evolving technology, so people use different acronyms. What we were previously talking about, digital light processing, DLP, in this reference, they call it digital light fabrication instead.

So those -- those will be two.

I'm trying to find the -- what they call the photopolymer inkjet printing. They don't call it the same name here.

If it's important, I can look for that specific process on the list.

Do you need me to, or were the first two that I gave you enough?

Q. Those examples are fine.

A. Okay.
Q. What technologies use the sheet process?
A. So on the right column, about two thirds of the way down, there's LOM. That refers to laminated object manufacturing. That's pretty much it. Well, as of 2012, that's the sheet process.
Q. Can you briefly describe laminated object manufacturing?
A. Yeah.
So the version that existed in 2012 involved rolling out a -- if -- you have a roll of paper like butcher's paper where it's got plastic on one side of it, so you roll that out. A laser basically cuts a contour in the paper, and then a hot roller rolls over that. And the plastic on the underside melts to the previous layer.
And then you keep doing that layer upon layer. And then when you're done, you essentially break away all of the cube material that's surrounding your part, and then you've got the final part that's done.
Q. What technologies use the dispensing process?
A. So that's -- let me -- when you're asking me, you're asking me to select from their list; is that correct?
Q. Or if you can think of something off the top

of your head.

A. Oh, okay.

So the -- the material jetting process that we were talking about before, which -- so I'll be completely honest with you. Some of the names that they assign to processes in this reference are not the ones that are commonly used.

Like I see reference to "fast inkjet," which I suspect -- I've never heard anybody use that term before, but I suspect that's similar to the -- the inkjet -- photopolymer inkjet process that we were talking about earlier.

And I don't see any others on their list that -- now -- I'm sorry, let me -- let me be more specific there.

The dispensing process, I actually thought I read "jetting" there. My apologies. I mis- -- I misread the name of the process.

So, yeah. Okay. I'm sorry, so the dispensing process where the material is melted -- so it's -- it's not normally -- so the dispensing is normally an extrusion process, which will be the fused filament fabrication, or FDM, the Fused Deposition Modeling process.

And it says "hot droplets" there. I'm trying

to think of a -- so if your melt -- I guess if you're inkjetting molten wax, that would be a different process that's described there.

Q. What technologies use the sintering process?

A. So in the context there, they're using the term "sintering," and they presumably mean melting as well. Sintering is just done at a lower temperature, and you're not melting the powder particles.

So whether it's sintering or melting, examples of that process would be the -- the laser powder bed fusion process that we talked about before, or selective laser sintering being the name that's more commonly used for plastic sintering.

Q. What technologies use the binding process?

A. So that would be the binder jetting process that we talked about where you spread a layer of powder and inkjet glue, if you will.

Q. I want to continue on to PDF page 6 of this exhibit.

A. Okay.

Q. At subheading 4.5, it's discussing Fused Deposition Modeling.

Would this be the same as the Fused Deposition Modeling discussed in the '466 patent?

A. Yes, it would.

Q. And that's a type of fused filament fabrication; is that correct?

A. Yes, they are typically used synonymously.

Q. Continuing on to page 7, under subheading 4.5.1, "Method," it discusses that "a filament of material is extruded out of a fine nozzle and deposited onto a platform."

Do you see that?

A. Yes, I do.

Q. So Fused Deposition Modeling involves dispensing material; is that correct?

A. Specifically extruding, yeah, as it's described. It's an extrusion process, yep.

Q. A few more sentences down, it states that "the extruded filament is hot."

How would the filament be heated in Fused Deposition Modeling?

A. Typically you have what's called a heater cartridge, which is nothing more than a fancy name for a little cylinder that heats up when you run current through it.

So you would have a -- a heater cartridge adjacent -- or within the block of, say, aluminum that the plastic is flowing through. And so the heat flows from the heater cartridge to the aluminum to the

plastic.

Q. Where would the heater cartridge be located with respect to the nozzle?

A. Typically it's very -- it's close to the nozzle, I would say. I'd have to draw it to show you exactly where. But it's upstream just a little bit from the nozzle when the plastic exits. About -- I don't know -- 5 or 10 millimeters above it.

Q. This paragraph goes on to state that "a second nozzle is used to extrude a different material in order to build up support structures for the part where needed."

And then in the next column, under subheading 4.5.3, "Disadvantages," it states that one of the disadvantages of FDM is support structures are needed.

So would you agree that FDM typically involves building support structures?

MR. TATUM: Objection. Form.

THE WITNESS: So this is kind of -- this is a survey paper -- and I will answer your question, just with a little bit of explanation.

It's a survey paper that's giving single bullets to add super high-level characterization. It is absolutely possible to print some parts without

supports; some parts require support. So it's -- support structures may be needed would have been a more accurate way for them to word that.

So sometimes support structures are needed.

BY MR. BISENIUS:

Q. So looking at the bottom of the second column of page 7, going on to page 8, in Section 4.6, it's discussing multi-jet modeling.

Is the multi-jet modeling mentioned here the same as or different than the multi-jet printing discussed in the '466 patent?

A. I'm trying to get figures here that are aligned with the process that's being described, so give me one second here.

So, yes, this appears to be similar to what we were talking about, what you just said. Yeah.

Q. So multi-jet modeling is at least similar to the multi-jet printing discussed in the '466 patent; is that correct?

A. Yes, that's my -- yes, that's my recollection without going back to the '466 patent's description, yep.

Q. Continuing on to subsection 4.6.1, "Method," in the second sentence, it states: "Where material is to be deposited, a jet dispenses a droplet of

thermoplastic polymer."

So this technique uses a dispensing process; is that correct?

A. I would -- it jets a droplet. I'll be honest. I've never heard of anyone else use the term "dispensing," but -- but it says what it says, yes. That's not a typical description, but it says what it says.

Q. A few sentences later, it states: "The hot droplets of material bond to the previous slice of the part that has just been printed."

How is the material heated to deposit hot droplets?

A. So -- so one thing -- let me clarify -- or let me correct something that I said earlier.

So the -- when we were talking about the multi-jet printing in the '466 patent, that was photopolymer jetting that they were describing where you use an ultraviolet light. And if you recall, I explicitly said that it does not use heat to cure the material but uses light to initiate a chemical reaction.

The process that's described here is different from that process in that this is using what's called a thermoplastic material that -- that is heated so that it melts. So I stand corrected when I -- just a moment ago

when I said they were describing the same process. So they are not.

But having said that correction, you asked how it's -- how the plastic is heated and melted; is that correct?

Q. Yes. How is the plastic heated in these systems?

A. Yeah. So for -- with this process -- which it, again, is different from what we were talking about earlier in the '466 patent, but -- but it's similar -- it would typically use something like a heater cartridge to melt the plastic.

Q. In these multi-jet modeling systems, would the heater cartridge be located adjacent or close to the nozzles?

A. They're typically a little bit farther upstream, but -- so in terms of absolute distance, they are not quite as close because, in this case, you have a large reservoir of molten plastic, not just a teeny -- a teeny filament.

So you're melting a boxful, if you will, a small boxful of plastic, in this case.

Q. Is the multi-jet modeling process described here similar to the binder jetting process you mentioned earlier, or are they different?

A. They are different.

Q. How does the multi-jet modeling differ from the binder jetting process?

A. So binder jetting, as we discussed earlier, is a powder-based process where you spread a layer of powder and then you jet a liquid plastic, which is not -- it's not a molten plastic like we're describing here. It's -- I always think of superglue. Right?

If you were to jet droplets of superglue and -- you're not heating those droplets up, generally speaking. And so they're -- in that sense, they are different processes. There is no powder bed in this multi-jet process.

Q. So here it's discussing heating of the material to dispense the hot droplets.

Would different materials require different heating temperatures in multi-jet modeling?

A. So, yes, if you change from one -- if you change from one kind of plastic to a different, they would have different melting temperatures and therefore different temperatures that you would heat them up for jetting.

The melting temperature is not the temperature that you jet at. But -- but, yes, they would have different -- different printing temperatures.

Q. This paragraph goes on to state: "Thin support pillars must also be built up slice by slice in the same material where they are needed."

And two sentences later, it states: "When all the slices have been completed, the part is removed from the machine, and support structure is broken off."

So would you agree that, in at least some cases, multi-jet modeling involves printing a support structure?

A. That's a generally correct statement. I think they made a mistake here saying it's in the same material. But, yes, "yes" to your question about at least sometimes requiring a support material. Not all the time, but sometimes.

Q. You're aware of solid freeform fabrication, or SFF, correct?

A. That's correct, yes.

Q. Was SFF employed in three-dimensional printers in 2012 and earlier?

A. Yes. It -- as I mentioned earlier, it was more commonly referred to as "FDM." Again, different names. FFF and FDM are just generic versus, you know, trademark names.

Q. So would fused filament fabrication and solid freeform fabrication be the same process?

A. I'm sorry. I might have misheard you. The question you just asked, I thought you were asking about FFF versus FDM.

Q. I'm sorry. I'll use the full names instead of the acronyms. We can start over on that.

A. Yeah.

Q. Was solid freeform fabrication used in three-dimensional printing in 2012 and earlier?

A. Okay. Yeah. And I -- my ears heard FFF.

So, yes, the SFF is actually not a name for one specific process. It's a generic term, umbrella term. It's the term that was used in the 1990s the way we today call -- use the term "3D printing."

And so SFF does not refer to one specific process. It's an umbrella term, if that makes sense.

Q. So would the curing processes, sheet processes, dispensing processes, sintering processes, and binding processes we were discussing earlier all fall under the umbrella term of "solid freeform fabrication"?

A. Yes. I think that's a fair statement. At least generally speaking, yeah.

MR. BISENIUS: I'm going to add another exhibit to the chat. This is Exhibit 1009, which is U.S. Patent Publication 2006/0127153.

(Exhibit 1009 was referenced.)
BY MR. BISENIUS:
Q. This is referred to in the papers as Menchik.
A. Okay. I have it open.
Q. When I use the term "Menchik," you understand that I'm referring to Exhibit 1009, correct?
A. Yes, I do.
Q. I want to talk about paragraph 4 of Menchik.
A. Okay.
Q. The first sentence here says: "Some three-dimensional printers utilize a printing head. For example, an inkjet-type printing head through which material" --
(Reporter requested clarification).
BY MR. BISENIUS:
Q. The first sentence in paragraph 4 states: "Some three-dimensional printers utilize a printing head. For example, an inkjet-type printing head through which material for printing three-dimensional objects is jetted."
Is the inkjet-type printing mentioned here the same as or different from the multi-jet printing we were discussing earlier?
A. It's -- there is actually not enough material here. This -- this paragraph, there's not enough

material here to definitively say "yes" or "no." It's actually a little bit vague. So --

And, for instance, binder jetting uses an inkjet head, but the multi-jet process -- you can't tell from this paragraph which -- which one of the two they are referring to.

Q. I'm going to go back to your declaration, Exhibit 2013.

And I want to talk about paragraph 13.

A. Okay.

Q. Here, you state: "In addition to teaching additive manufacturing/3D printing classes, I have taught computer-aided design (CAD) and computer-aided manufacturing (CAM) classes over the past 30 years."

Would you have a high level of overlap of enrollment of students between your 3D printing classes and your CAD and CAM classes?

A. I -- maybe about 25 percent overlap. And obviously it shifts from year to year, semester to semester. But students that take both classes, maybe 25 percent.

Q. What is computer-aided design?

A. So the -- the general term is typically used to describe a process of using a computer software package to design the shape -- let's say the size and

the shape of components, sometimes, in an assembly.

Q. What CAD software did you teach in your classes around 2012 and earlier?

A. During that timeframe, I was using a software package called SolidWorks.

Q. Can you name other CAD software that you had used prior to 2012?

A. S -- SDRC I-DEAS. SDRC was the company. I-DEAS was the software.

AutoCAD would be another one.

Those were the primary ones.

The overwhelming majority of my CAD teaching was SolidWorks.

Q. What type of device would this type of software such as AutoCAD or SolidWorks typically be installed on?

A. It would typically be installed on a personal computer or a laptop computer.

Q. Earlier, we discussed that the '466 patent mentioned that client devices can be personal computers such as laptop computers.

Would a client device such as those mentioned in the '466 patent be suitable for running CAD software?

A. It -- it is possible to run CAD software on a client device, assuming the client device is a personal

computer, yes.

Q. CAD software is used to create CAD files, correct?

A. Among other things. But, yes, CAD files is the primary intent.

Q. What information is in a CAD file?

A. As a general rule, it's what I described earlier. It's the -- the size and shape of the geometry that defines the parts.

Q. How does a personal computer communicate with a printer?

A. It could be connected via the Ethernet. A laptop could wirelessly communicate. Or you could -- I mean, those would be some common communication methods.

Q. How are CAD files typically transferred from a personal computer to a printer?

A. When you say "printer," you mean 3D printer?

Q. Correct.

A. Okay. The -- the most common method still -- it's archaic, but -- the most common method is to transfer the file -- well, you're -- you said the CAD file, right, not the -- what we call the slice file? I just want to make sure I'm hearing you correctly.

Q. Yes, I said CAD file.

A. Okay. Yes. Thank you.

So you -- you could transfer the CAD file. It could be over an Ethernet. How it's most commonly done today is still -- you save it to a USB memory stick, for instance, and then walk to the 3D printer and plug it in and do the slicing software that -- that generates the instructions for operating the 3D printer.

Q. Prior to 2012, was it also known to transfer CAD files from a computer to a three-dimensional printer over a network?

A. I won't rule it out definitively. I can say that I personally did not do that, and I can't think of instances where my students or I did that.

But I won't -- I can't rule out that it wasn't possible that -- that -- you know, again, the 2012, the sliding timeline as far as when that became a possible thing. I can just tell you I don't believe that I ever personally did that prior to 2012.

Q. In 2012 and earlier, would 3D printers have typically had CAD software installed directly on them?

A. I -- CAD software. I don't -- so, again, it's -- it's not that you couldn't do it. So it was possible to do that if -- provided the 3D printer has a PC or personal computer as part of the 3D printing system.

The fact that I -- normally I would do the

design, let's say, in my office, and then the file would go to the 3D printer for slicing. So it would just -- it's not that it's not possible. It's just it would be awkward typically to do the designing sitting next to the -- next to the 3D printer.

Q. So in general, you would design the models on a computer running CAD software and then transfer the CAD file to the three-dimensional printer in some manner; is that correct?

A. Yes. So that it could be prepared for 3D printing.

MR. BISENIUS: I'm going to drop another exhibit in the chat. This is Exhibit 1004.

And I'll admit I'm very bad at pronouncing last names, but I've been pronouncing this as Loughran.

(Exhibit 1004 was referenced.)

BY MR. BISENIUS:

Q. This is U.S. Patent Publication 2006/0091199, referred to as "Loughran" in the papers.

A. So it has -- at least on my computer, Menchik is the most recent one. Maybe -- maybe resend it. I can see and hear you just fine, so I don't think we're having a network problem, but I'm not --

Oh, okay. It just arrived. Got it.

Okay. I have it open now.

Q. All right. I want to start at paragraph 1. Okay.

Paragraph 1 refers to solid freeform fabrication and gives the abbreviation SFF.

Earlier, you mentioned that this is a generic term for three-dimensional printing; is that correct?

A. Yes, that's correct.

Q. Staying on the same page and looking at paragraph 12.

About halfway through the paragraph, it states: "In some embodiments of the invention, the first SFF system 102 may be considered a client to the second SFF system 104, in that the first SFF system 102 provides SFF jobs to the second SFF system 104 and the second SFF system 104 fabricates these jobs."

Do you see that?

A. I do.

Q. So I'm going to be referring to the SFF system 102 and the SFF system 104 quite a bit in my next line of questions, so I just want to clarify something that I believe might be an error in Loughran.

A. Yes. Yes. I know where you're headed with that.

Q. Okay. So comparing this paragraph to Figure 1, this paragraph states that the first SFF

system is the system 102, but in Figure 1, it uses the numeral 104 to refer to the first SFF system. And so I want to make sure that we're on the same page about this.

The sentence I just read from paragraph 12 refers to the SFF system 102 as a client.

Do you see that?

A. Let me just find it here. I'll just search for the word "client." That will speed things up.

Why is it not finding it?

Can you point me to -- is it --

Q. It's in paragraph 12.

A. All right.

Q. That sentence I just read was about -- a little more than halfway through paragraph 12.

A. Okay. Okay. Got it. The first SFF system may be considered a client to the second.

Okay. We're at the same place.

Q. Okay. So we'd agree that SFF system 102 is identified as a client here?

A. Yes.

Q. And then it goes on to say that the SFF system 104 fabricates these jobs.

A. Yes, I see where it says that.

Q. So would you agree that the SFF system 104 is

a printer, a three-dimensional printer?

A. It includes a -- the word "system" in this case would include a 3D printer.

Q. So going back to Figure 1, would you agree that the SFF system 102 in the upper right is the client and the SFF system 104 in the bottom middle is the system where the printer is located?

A. So it -- yes, as it's illustrated there.

Q. Okay. So to correct for the typo or mistake in Figure 1, I'm not going to use the term "second FSS system" (sic) or "first SFF system." I'm going to use the reference numerals 102 and 104 because I believe those are consistent between this figure and paragraph 12 of the rest of the specification.

A. Okay. I will --

Q. Does that make --

A. Yes, that makes sense.

And I'll try to correct myself if I -- if I get into a situation where I, myself, use them backwards.

Q. All right. I want to talk about paragraph 20 in Loughran.

A. Okay.

Q. So this paragraph discusses both the SFF system 102, which is the client, and the SFF system 104,

which is the location of the printer; is that correct?

A. Yes, it mentions both of those.

Q. This paragraph states that the SFF fabrication jobs are generated at the SFF system 102; is that correct?

A. Okay. I'm sorry. I was reading the bottom there.

So, yes, I see that SFF fabrication jobs are generated at the first SFF system 102.

Q. So would you agree that the client system fabricates -- sorry, would you agree that the client system generates the fabrication jobs?

A. Client -- I've got to slow down now with the mix-up. So, yes, the client system is -- is able to generate the job in this scenario that's described right there.

Q. And generation of the fabrication job would include generation of the model of the object; is that correct?

A. As it's described in here, from the CAD software, so -- and I -- I pronounce it Loughran, but however we pronounce this patent -- it mentions in other paragraphs the CAD software generating the SFF job. So that's what it's alluding to here.

Q. Moving ahead to paragraph 27 on the next page.

A. Okay.

Q. This paragraph describes that the fabrication job is generated at the client SFF system 102 and then executed at the SFF system 104; is that correct?

A. You're paraphrasing, or that's an exact quote?

Q. I'm paraphrasing.

A. Okay. I'm sorry. Yes. I was looking for the --

Yes. A continuation of what we were talking about a moment ago, fabrication of physical objects by the second SFF system. Yes.

Q. So the fabrication happens at the SFF system 104; is that correct?

A. I'm sorry. Yes.

Q. Then in the next paragraph, in the second sentence -- and this is a quote -- it states, quote: "The second SFF system 104 may have already sent the material identifier for the material 112 to the first SFF system 102, as indicated by the letter C 122, such that the first SFF system 102 requests this information only if it does not already have it," end quote.

So would you agree that this portion is describing that the SFF system 104, where the printer is located, sends the material identifier to the client, SFF system 102?

A. It says it may have, yes, sent the material identifier. It qualifies it. It says if the --

Hang on. Sorry. I've got meeting invites popping up here that -- of meetings I'm not attending, so let me dismiss those.

Yes, the first system 102 may have the information regarding the material.

Q. Okay.

A. I'm with you now.

Q. Good.

It's describing that, in at least some scenarios, the system where the printer is located sends material identifiers to the client system; is that correct?

A. Yes, that appears to be correct in this -- in this paragraph.

Q. I'll use your pronunciation because you're probably right.

I want to move to paragraph 41 of Loughran.

A. Okay.

Q. The first sentence here states: "The first SFF system 102 receives a first list of material identifiers known to the second SFF system 104 over the network 106, as well as optionally other information (402)."

So, again, this paragraph is describing that the client system receives material identifiers from the system where the printer is located; is that correct?

A. Yes, that appears to be correct.

Q. Continuing on to the next paragraph, in the second sentence, which is at the top of the second column, it states: "For each material identifier that is in the first list but not in the second list, the first SFF system 102 retrieves information regarding the material associated therewith."

So this paragraph is describing that the client system retrieves information about the materials; is that correct?

A. "Retrieves information regarding the material." Yes, it says that there.

Q. And it says that the material information is provided by the material information server 108; is that correct?

A. Yes. It's describing that scenario there.

Q. Continuing on to paragraph 43, several sentences in, about halfway down, after step 414, it states: "The first SFF system 102 then parses the information regarding the materials for using it in SFF fabrication job generation."

Do you see that?

A. Yes, I do.

Q. So would you agree that this is describing that the client system uses information about the material to generate the CAD file?

A. Well, that paragraph does not refer to the CAD file. If you --

Paragraph 27 of Loughran describes how the CAD software -- so it describes the -- the CAD -- I'm about six lines down -- that the CAD software may have to have information regarding the material so that the job "can be accurately generate" -- I think they meant generated -- "for ultimate fabrication of physical objects for (sic) the material."

So it uses, for instance, build time estimation, part scaling for shrinkage, and so on. So that's how it's -- that's what the CAD system is doing. So if --

Are you able to repeat the question, and I'll tie it into what I just showed?

Q. Yeah. And I can reframe it a little bit.

A. Sure.

Q. Would you agree that at least some of the information included in the fabrication job generated by the client device is based on the material information?

A. So in the sense -- I'll actually answer that

using paragraph 27.

So when -- so if you say the shrinkage of the materials, the example that they give there, you would design the shape of the part. If you know how much it's going to shrink, in the CAD software, you might enlarge it a little bit so that, after you print it and it shrinks, it's the correct size.

So in that case, it's using a property of the material shrinkage to generate the size and shape of the part before it's sent off for slicing on the 3D printer.

Q. Moving ahead to paragraph 50 --

A. Did you say 50 or 58?

Q. 50, 5-0.

A. Got it. Thank you.

Q. This states: "Figure 6 shows a block diagram of the first SFF system 102."

So would you agree that this paragraph is discussing the client system?

A. Yes. 102 is the client; 104 is where the 3D printing takes place. So, yes, I believe that's correct.

Q. Later on in paragraph 50, it states that the client system includes CAD software 610; is that correct?

A. Yes, I see that. Yep.

Q. In the next paragraph, 51, in the second sentence, about halfway through the second sentence, it states that "the CAD software 610 has information by which to generate SFF fabrication jobs for transmission to the second SFF system 104 over the network 106."

Do you see that?

A. Yes, I do.

Q. So once again, this is describing that the client device generates the fabrication job and then sends it to the system where the printer is located; is that correct?

A. From the CAD soft- -- so the SFF fabrication job, as defined by the CAD geometry, is being sent to the system 104, where the job is 3D printed.

Q. I want to move ahead to paragraph 55 on the next page.

A. Okay.

Q. A few sentences in, a little more than halfway through this paragraph, it states, quote: "The CAD software 610 generates a SFF fabrication job for fabrication from a specific material based on the information regarding that material which has been received," end quote.

Do you see that?

A. I do see that, yes.

Q. So this is, once again, describing that the client device uses information about the material to generate the fabrication job; is that correct?

A. And referring back to paragraph 37, just to be specific about what it's doing, it is defining the size and shape of the part in the CAD software. And that can be done using information regarding the material to do that process.

Q. So would you agree that the fabrication job is providing instructions to the SFF system 104 to instruct the printer on how to print the object?

MR. TATUM: Objection --

THE WITNESS: No --

No, I would not agree with that.

The -- again, using paragraph 37 as an example, there's -- there's nothing -- nothing that says anything about instructions about how to print -- print the part.

It talks about CAD software, and a POSITA knows that CAD software is used to design the size and the shape of a part. A --

And did you just -- you used the term -- you said how to print the part? Was that the phrase that you used?

BY MR. BISENIUS:

Q. I think so.

A. Okay. So the -- I mean, putting it in the context of the '466 patent, the operational parameters that tell the printer how to print the part that's -- so I think we have a difference of opinion here that the CAD model -- the size and the shape of the part is not instructions on how to print the -- print the part.

Q. Maybe I can reframe it a different way.

Would you agree that the SFF system 104 where the printer is located relies on information in the CAD file to define how the part is printed?

A. So it will -- so it -- it needs the information, the size and shape of the part, to generate --

It's conventionally called slicer software. But the slicer software is what would generate the instructions or operational parameters, if you want to call them, or instructions on how to print the part.

MR. BISENIUS: I'm going to switch to another exhibit, and it's been close to an hour again. Now would be a good time for a break. I know you're on the East Coast. Would you like to do lunch now or a shorter break and wait until later?

THE WITNESS: Honestly, I had breakfast at 4:00 o'clock this morning. I'm a morning person, so

that was eight hours ago. So I wouldn't mind having lunch now.

MR. BISENIUS: Okay. Should we reconvene at maybe 50 past the hour, 10:02?

THE WITNESS: That works for me. Thanks.

(Lunch recess: 12:08 p.m. to 12:51 p.m. Eastern Time.)

MR. BISENIUS: Back on the record.

I've added Exhibit 1005 to the chat.

(Exhibit 1005 was referenced.)

THE WITNESS: Yes, I've got it.

BY MR. BISENIUS:

Q. This is U.S. Patent Publication 2008/0192074, referred to as "Dubois" in the papers.

I want to go to paragraph 55 of Dubois.

A. Okay.

Q. This paragraph states, quote: "To determine the print layers, the embodiment of the method according to the invention produces 'layers of object,' which are obtained by slicing the 3D representation of the component into slices of equal thickness and consequently slicing the characteristic objects and which are used here to determine print layers."

Do you see that?

A. Yes, I do.

Q. You mentioned slicing software earlier today. The software that generates the slices from a 3D model is often referred to as "slicing software" or a "slicer"; is that correct?

A. Yes, that's correct.

Q. Does 3D printing in general usually require slicing a 3D model into multiple slices?

A. Generally -- yes, generally, that's correct.

Q. We talked about quite a few different three-dimensional fabrication processes earlier today.

Can you identify any of those processes that wouldn't involve slicing a 3D model into multiple slices?

A. Not in the ones that we've talked about today.

Q. So in other words, all of the three-dimensional printing processes that we've discussed today would include slicing a 3D model into multiple slices; is that correct?

A. That's generally correct, yes.

Q. I'm going to skip ahead a few pages to paragraph 150, 1-5-0.

A. Okay.

Q. This paragraph is, again, discussing slicing of a 3D model; is that correct?

A. Yes. The unit 198 is adapted to slice the 3D

representation.

Q. And it's the computation unit 198 that performs the slicing function here; is that correct?

A. Yes, that's what it says.

Q. Skipping ahead two more pages, I want to talk about paragraph 170.

A. Okay.

Q. This paragraph states that the computation unit 198, along with computation units 201, 202, 203, the analysis unit 205, and the unit 206, can be implemented as software running on a personal computer such as a PC; is that correct?

A. It says -- yes, it says words to those effect.

Q. So looking at these paragraphs together, this is describing that the slicer software is executing on a personal computer; is that correct?

A. It can be, yes.

Q. In this scenario, would the personal computer be part of the 3D printer, or it would be a separate device from the 3D printer?

A. I'm not seeing where it specifies one or the other. So do you want me to look at the figures and tease that out?

Q. Yes, that would be helpful.

A. Okay. And just fair warning, this will take

me a few minutes here.

All right. I'm jumping back and forth from Figure 5. Can you remind me what -- what paragraph that text was in that we were just at?

Q. 170.

A. 1-7-0. All right.

(Pause on the record.)

THE WITNESS: I do apologize. This is going to take me a little while because of how much I'm jumping back and forth. So thank you for your patience here.

Other thing, it's not a searchable document. So that's slowing me down as well.

Okay. Can you repeat the question, please?

BY MR. BISENIUS:

Q. Would the PC that's running the computation units 198, 201, 202, and 203 be separate from the three-dimensional printer?

A. Can you clarify if you mean physically or functionally?

Q. Would it be a distinct device from the three-dimensional printer?

A. It's -- I don't believe it says one way or the other here. So you're asking a hypothetical, could it be. Sorry, just --

So there are 3D printers that have PCs attached to them that are, you know -- we'll call it adjacent to it as opposed to physically inside the box, running software that performs many of the functions that are described there in the control units.

Q. Could the personal computer described in paragraph 170 be separate from the three-dimensional printer?

A. So "separate" meaning it doesn't -- correct, "separate" meaning it doesn't have to be physically inside the box of the 3D printer?

Q. Correct. That's what it means.

A. Yes, that is correct.

Q. I want to go back to your declaration, Exhibit 2013.

And I want to start at paragraph 135, which is on page 66.

A. Okay.

Q. Starting at the second sentence of paragraph 135, you state, quote: "In my professional opinion, Devos's 'supports' parenthetical is unrelated to 3D printed supports. It is, at most, an aside related to potential use of a settling coefficient to inform decisions about thermal postprocessing support requirements that could take place after the component

has been three-dimensionally printed," end quote.

Do you see that?

A. I do.

Q. Does Devos itself discuss thermal postprocessing?

A. Just to be clear, you have not loaded -- you have not loaded Devos yet, correct?

Q. Correct.

A. Okay. We don't have Devos.

Q. Yeah. I can bring it in.

A. So I can -- I can tell my answer from memory.

Q. I've uploaded Devos.

A. Okay. It just arrived.

Q. And I'll repeat the question just to make the transcript a bit clearer.

A. Yes. Thank you.

Q. Is there any discussion in Devos of thermal postprocessing?

A. Okay. So -- so the documents that we have are not searchable, so I can -- I can read through the whole thing and confirm my recollection, or I can give you my recollection with the asterisk that I might have to go back and reread it if I stand -- and correct it.

So do you have a preference if I read through the whole thing since it's not searchable or go from

memory and reserve the right to change --

Q. I'm fine. Answer from memory works for me.

A. Okay. So I do not have -- I do not recall Devos mentioning thermal postprocessing.

Q. Can you describe the thermal postprocessing that you discuss in paragraph 135?

A. Yes, let me jump to that paragraph again.

So with -- with this process, you will -- and to be honest with you, this typically doesn't apply, but if you're --

If, for instance, you are making metal parts, with binder jetting, there is a second step that happens after 3D printing in which the part coming out of the 3D printer is not in its final form. It has the shape that you want, but it's very weak because it's just the glue holding the metal particles together.

So you would then transfer that part from the 3D printer, and you would put it in a furnace and heat it up very slowly. And, you know, over a period of many hours, the -- the glue that's holding the particles together will burn off, and the metal particles will then sinter or fuse together. And then you have your final metal part.

Q. So in paragraph 135, are you describing that, in some scenarios, that thermal treatment would require

support structures?

A. I think I -- I describe it a little more farther down, but there --

So, yes, there can be. It's not always, but there could be scenarios where, in the furnace -- not in the 3D printer and not during the 3D printing process, but -- in the furnace afterwards, the part might, let's say, sag. Right?

And so it's -- at that time, it was customary, if you had that kind of a situation, where you might put a ceramic pillar or something underneath the part to hold it up for support.

Q. When would those supports be added? Would they be generated during the 3D printing process?

A. So as of 2012, and prior to 2012, it was customary -- as I was describing, it was customary to use ceramic pillars or, you know, blocks, cubes, whatever. And you would put them underneath the surfaces where the part would have a possibility of sagging.

Q. Are you saying that a person would physically put the ceramic supports under the parts that would have a possibility of sagging?

A. That was the typical scenario as of 2012. But there have been developments since then, since -- newer

than 2012, that changed that. But from 2012 to previous, that was -- what I just described was the -- was the typical approach.

Q. How would a powder settling coefficient inform decisions about thermal postprocessing support requirements?

A. So if you -- this does not apply to a POSITA. If you were a -- let's say a Ph.D. with expertise in computational multi-physic simulations, that is, the -- give me one sec to work out -- these are not searchable, so give me one sec.

Okay. Okay. So I found it. I'm on paragraph 139 of my declaration.

So as it's explained there, the powder settling coefficient determines how much powder particles will compact, if you will, during that printing process.

During the subsequent sintering process, the density of those particles can affect how strong the material is and whether or not it's therefore liable to sag or collapse.

And so you have to look at the shape of the part, and then you're looking at the powder settling coefficient and doing very complex simulations to -- simulations of how the material will behave during the

sintering process after the 3D printing process to predict whether or not it will sag.

That is -- that's getting towards the need to have support during that sintering process.

Q. So from what you just described, is it fair to say that the powder settling coefficient is a factor that's used in determining what those support requirements would be?

A. It is a piece of information that can be used -- that can be used to determine, yes, whether or not supports are needed not during 3D printing but during the sintering process.

MR. BISENIUS: I'll drop another exhibit in the chat. This is Exhibit 1018.

(Exhibit 1018 was referenced.)

BY MR. BISENIUS:

Q. This is the KISSlicer Quick-Start Guide, referred to as "KISSlicer" in the papers.

A. Okay. I have it open.

Q. KISSlicer describes slicing software for slicing a 3D model into layers; is that correct?

A. That's -- that's one of its functions. That's correct.

Q. Would KISSlicer software perform a similar function to the slicer we were discussing with respect

to Dubois?

A. The -- let me -- give me one second here to open Dubois as well.

Q. And just to refresh your memory on Dubois, earlier, we had talked about paragraphs 55, 150, and 170.

A. Yeah. So the -- the answer is it will -- it is -- it will generate the slice geometry. Just the one asterisk or clarification is that the -- the shape of how the -- I'm sorry -- how the material is deposited is different between the process that KISSlicer uses and the process that you would have to use for Dubois.

And so the specific example with KISSlicer refers to the fused filament fabrication, FFF, process. And so sometimes the inside of a part with that process can be hollow, or you can envision it would have a honeycomb structure on the inside; whereas with the inkjet process used in Dubois, the inside of the part is always completely solid. So the output of the slicing process is not generally going to be the same.

But what they do have in common is the upfront -- the math part of it up front of slicing into layers. The output is different, though.

Q. Can you identify where in KISSlicer it discusses being used for fused filament fabrication?

A. I just accidentally closed KISSlicer, so give me one second.

Q. No worries.

A. I've got enough windows open now that the KISSlicer is on the right side, and it's a tiny little button, and I clicked the X instead of -- yeah.

So the -- my recollection on this also is KISSlicer at one point in time was used with Stratasys -- with the Stratasys printers that are filament extrusion.

So, for instance, it's -- I'm on -- it doesn't matter -- page 3, let's say, the images that are on page 3, one of the tabs says "extruders." So "extruders" refers to fused filament fabrication.

And then the text in those windows, the window on the top there says "Extrusion Width" -- "Infill Extrusion Width" -- and so those are -- as the name implies, those are extrusion-based processes.

So fused filament fabrication, a POSITA would refer to that as the extrusion process of it. You know, how it works.

Q. The KISSlicer software is distinct from software used for controlling the operations of a 3D printer; is that correct?

A. That -- that would generally be correct, yes.

It's a preparation. You can think of it -- the function is that it serves as preparation rather than operating the 3D printer.

Q. Would KISSlicer software generally be installed on a personal computer or directly onto the 3D printer itself?

A. I've seen it both ways.

Q. Had you used -- had you personally used KISSlicer software prior to 2012?

A. No. Softwares functionally similar to it, but not KISSlicer directly.

Q. Has a Court ever precluded you from offering an opinion?

A. Not to my knowledge, no.

Q. To the best of your knowledge, has a Court ever criticized one of your opinions?

A. I -- not that I'm aware of, no.

Q. Have you spoken with Mr. Tatum or Mr. Oaks regarding the substance of your testimony today at any time after you were sworn in by the court reporter?

A. No, I have not.

MR. BISENIUS: No further questions.

MR. TATUM: Can we just take a quick break, maybe ten minutes? I can go over my notes, and then we can come back.

MR. BISENIUS: Sounds good.
THE WITNESS: 1:30?
MR. BISENIUS: Yeah.
(Recess: 1:21 p.m. to 1:29 p.m. Eastern Time)
MR. TATUM: No further questions for me.
MR. BISENIUS: All right. Thanks.
MR. TATUM: Thank you, Dr. Cormier.
THE WITNESS: Okay. Thank you.
COURT REPORTER: Mr. Tatum, would you like a copy, sir?
MR. TATUM: Yes, a copy, but not in a rush. I think we have a standard, whatever the ten-day is, I believe.
COURT REPORTER: All right. Would you like a rough that's requested?
MR. TATUM: Oh. No, don't need the rough.
MR. BISENIUS: Yeah. I think we wanted the rough, and then we want the formal by April 6th.
(Whereupon the proceedings concluded at 1:31 p.m. EST)

ERRATA SHEET

NAME OF CASE: SHENZEN TUOZHU TECHNOLOGY CO., LTD. V. STRATASYS, INC.
DATE OF DEPOSITION: MARCH 25, 2026
NAME OF WITNESS: DENIS R. CORMIER

Reason Codes:

1: To clarify the record.
2: To conform to the facts.
3: To correct transcription error.

Page _____ Line _____ Reason _____

From _____ to _____

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Page _____ Line _____ Reason _____

From _____ to _____

Page _____ Line _____ Reason _____

From _____ to _____

Deponent's Signature _____

Date_____

DECLARATION UNDER PENALTY OF PERJURY

I, DENIS R. CORMIER, do hereby certify under penalty of perjury that I have read the foregoing transcript of my deposition taken on March 25, 2026; that I have made such corrections as appear noted on the Deposition Errata Page(s), attached hereto, signed by me; that my testimony as contained herein, as corrected, is true and correct.

This Declaration is executed this _____ day of _____, 20___, at _____, California.

_____

DENIS R. CORMIER

STATE OF CALIFORNIA)
) ss.
)

I, Tamara Houston, RPR, CCRR, CSR No. 7244, a Certified Shorthand Reporter in the State of California, duly empowered to administer oaths, do hereby certify:

That, prior to being examined, the witness named in the foregoing deposition was by me duly sworn to testify to the truth, the whole truth, and nothing but the truth;

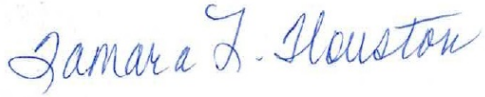
That said deposition was taken down by me in shorthand at the time and place therein named, and thereafter reduced to typewriting by computer-aided transcription under my direction;

That the dismantling, unsealing, or unbinding of the original transcript will render the reporter's certification null and void.

I further certify that I am not interested in the event of the action.

In witness whereof, I have hereunto subscribed my name.

Dated: 1st of April, 2026.



TAMARA L. HOUSTON
CSR 7244, RPR, CCRR 140, CRG