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Transcript of James F. Shanley, Ph.D.

Date: November 6, 2024

Case: Hesai Technology Co., Ltd. -v- Ouster, Inc. (PTAB)

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Transcript of James F. Shanley, Ph.D.
Conducted on November 6, 2024

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2 BEFORE THE PATENT TRIAL AND APPEAL BOARD	2 EXAMINATION OF JAMES F. SHANLEY, PH.D. PAGE
3 - - - - -x	3 By Mr. Lauppe 4
4 HESAI TECHNOLOGY CO., LTD, : IPR No. 2023-01421	4
5 Petitioner, : U.S. Patent 11,175,405	5
6 v. :	6 E X H I B I T S
7 OUSTER, INC., :	7 (Previously marked.)
8 Patent Owner. :	8 EXHIBITS PAGE
9 - - - - -x	9 Exhibit 1001 '405 patent 6
10	10 Exhibit 1006 Droz patent 9
11 Deposition of James F. Shanley, Ph.D.	11 Exhibit 1033 Reply declaration 5
12 Boston, Massachusetts	12
13 November 6, 2024	13
14 11:45 a.m.	14
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20 Job No.: 559678	20
21 Pages: 1 - 16	21
22 Reported By: Alan H. Brock, RDR, CRR	22
2	4
1 A P P E A R A N C E S	1 November 6, 2024 11:45 a.m.
2 ON BEHALF OF PETITIONER:	2 P R O C E E D I N G S
3 QUINN EMANUEL URQUHART & SULLIVAN, LLP	3 JAMES F. SHANLEY, PH.D.,
4 RON HAGIZ, EQ.	4 being first duly sworn or affirmed to testify to the
5 51 Madison Avenue	5 truth, the whole truth, and nothing but the truth, was
6 New York, New York 10010	6 examined and testified as follows:
7 212.849.7000	7 EXAMINATION
8 ronhagiz@quinnemanuel.com	8 BY MR. LAUPPE:
9	9 Q. Hi, Dr. Shanley. Is there any reason you
10 ON BEHALF OF PATENT OWNER:	10 can't provide truthful testimony today?
11 COOLEY LLP	11 A. No.
12 PATRICK LAUPPE, ESQ.	12 Q. And just to get a couple of administrative
13 3175 Hanover Street	13 things out of the way: If I refer to the '381 patent
14 Palo Alto, California 94304-1130	14 IPR, do you understand that refers to IPR2023-01456?
15 650.843.5000	15 A. Yes.
16 plauppe@cooley.com	16 Q. And if I refer to the '750 patent IPR, do you
17	17 understand that refers to IPR2023-01457?
18	18 A. Yes.
19	19 Q. And if I refer to the '405 patent IPR, do you
20	20 understand that refers to IPR2023-01421?
21	21 A. Yes.
22	22 Q. And for each of these proceedings, if I refer

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5 1 to your opening declaration, do you understand that 2 refers to the declaration you submitted with the 3 petition in each of those proceedings? 4 A. Yes. 5 Q. And for each of these proceedings, if I refer 6 to your reply declaration, do you understand that 7 refers to the declaration you submitted with the 8 petitioner reply in each of those proceedings? 9 A. Yes. 10 Q. I'm going to introduce Exhibit 1033 in the 11 '405 patent IPR, which is what we're discussing in 12 this portion of today's deposition, and which is your 13 reply declaration in that proceeding. 14 (Exhibit 1033 previously marked for 15 identification.) 16 Q. So can you go to Paragraph 15 on Page 4 of 17 Exhibit 1033. 18 A. Yes. 19 MR. LAUPPE: Off the record. 20 (Discussion off the record.) 21 MR. LAUPPE: Back on the record. I'd like 22 to introduce Exhibit 1001 in the '405 patent IPR,	7 1 you see that? 2 A. Where does that start again? 3 Q. Sorry, I think I lost you. So at the very 4 bottom 6 -- 5 A. Oh, okay. "In addition"? 6 Q. Exactly. Do you see where that paragraph 7 says, "In addition, even in the context of this 8 example, a POSITA would understand that the aperture 9 layer defines the field of view, not the stop region 10 specifically, because it is the aperture layer 11 (comprising both the optically non-transparent stop 12 region and the optically transparent aperture) that is 13 placed at the focal plane of the imaging optic"? Do 14 you see that? 15 A. Yes. 16 Q. So in this example, would you agree that the 17 stop region has an impact on the field of view? 18 MR. HAGIZ: Objection. 19 A. It's really the aperture layer that defines 20 the field of view. And the top region refers to a lot 21 of different types of region in an optical system. 22 And so my statement that the aperture layer defines
6 1 which is the '405 patent. 2 (Exhibit 1001 previously marked for 3 identification.) 4 Q. So Dr. Shanley, do you see in Paragraph 15 on 5 Page 4 of your reply declaration in the '405 patent 6 IPR, do you see that at the top of this paragraph you 7 are discussing an excerpt from the '405 patent 8 specification that says "an input aperture layer 1740 9 including an optically transparent aperture 1744 and 10 optically non-transparent stop region 1746 configured 11 to define a narrow field of view when placed at the 12 focal plane of an imaging optic"? Do you see that? 13 A. Yes. 14 Q. And then toward the bottom of that same page 15 in your declaration, do you see the sentence, "In 16 addition, even in the context of this example, a 17 POSITA would understand that the aperture layer 18 defines the field of view, not the stop region 19 specifically, because it is the aperture layer 20 (comprising both the optically non-transparent stop 21 region and the optically transparent aperture) that is 22 placed at the focal plane of the imaging optic"? Do	8 1 the field of view I think is pretty clear -- that it 2 itself defines the field of view. 3 Q. But you said here that the aperture layer 4 comprises both the optically non-transparent stop 5 region and the optically transparent aperture; 6 correct? 7 A. Let's see. That's the beginning of the 8 paragraph? 9 Q. No, that's right at the end. 10 A. Yes, I agree with my statement here. 11 Q. Right. So as a part of the aperture layer, 12 does the optically non-transparent stop region have an 13 impact on the field of view? 14 MR. HAGIZ: Objection to form. 15 A. Does the optically -- let's see. 16 Yes, in terms of -- let me qualify that 17 statement. Let me not say "yes." But let me say that 18 the aperture layer defines the field of view and the 19 stop regions are there to limit extraneous light. 20 So it is in the full context of the thing. 21 And as I stated, you know, the aperture layer 22 comprising both the optically non-transparent stop

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9 1 region and the optically transparent aperture -- so I 2 think that qualifies it. 3 So my answer is the aperture defines the 4 field of view and the stop regions are there for stray 5 light and any other extrinsic light that could be part 6 of it. 7 So my statement in the declaration is 8 pretty consistent. 9 Q. And then let's turn to Droz, which is Exhibit 10 1006 in the '405 patent IPR. 11 (Exhibit 1006 previously marked for 12 identification.) 13 Q. And can you turn to Figure 3B, which is on 14 Page 6 of Exhibit 1006. Do you recognize this figure 15 in Droz? 16 A. Yes. 17 Q. This is a figure you relied on in Droz; 18 correct? 19 A. Yes. 20 Q. Do you see layers 372 and 376 in Figure 3B? 21 A. Yes, the cladding layer. 22 Q. Are those cladding layers reflective?	11 1 a glass or high-index polymer substrate for instance, 2 that is transparent to at least some wavelengths of 3 light 302"? Do you see that? 4 A. Yes. 5 Q. Now looking back at Figure 3B, after having 6 reviewed that excerpt from Droz's specification, does 7 that refresh your memory as to what layer 374 is? 8 A. Yes. 9 Q. So light passes through layer 374; correct? 10 A. Yes. 11 Q. And so for the light that passes through 12 layer 374, are layers 372 and 376 reflective for that 13 light? 14 MR. HAGIZ: Objection to form. 15 A. Are layers.... 16 Let me get my bearings here again. 17 Well, it also says that.... 18 Let me change my glasses. 19 Q. Take your time. 20 A. So the core layer is 364, 374, and 384. So 21 that's the core layer. And absorbing layers are 368 22 and 378.
10 1 MR. HAGIZ: Objection, form. 2 A. Those cladding layers, as I stated in my 3 declaration, are part of the aperture. 4 MR. LAUPPE: Strike as nonresponsive. 5 Q. Are those cladding layers, for example 372 6 and 376 in Figure 3B of Droz, are those reflective? 7 MR. HAGIZ: Objection to form. 8 A. My question would be reflective of what, 9 radiation? 10 Q. So you see layer 374 in Figure 3B? 11 A. 374, yes. 12 Q. And what is layer 374? 13 A. That's the waveguide, or part of the 14 waveguide. 15 Q. So I just point you to, in Droz -- can you go 16 to Page 14 in Droz? It's column 13. 17 A. Page 14, column 13. 18 Q. And can you go down to line 35 in column 13. 19 A. Line 35. Okay. 20 Q. Do you see where Droz -- column 13, line 35, 21 says, "Core layers 364, 374, and 384 may comprise a 22 relatively high index of refraction material, such as	12 1 Now, what was your question? 2 Q. So for light passing through core layer 374, 3 if that light reaches the edge of layer 374 and hits 4 either layer 372 or 376, is that light reflected? 5 MR. HAGIZ: Objection to form. 6 A. So the question is the aperture includes the 7 cladding layer; okay? That's our definition of the 8 aperture, as I stated in my declaration. And your 9 question is, so -- 10 Light that comes in that's part of the 11 signal will be reflected inside that waveguide and 12 channeled to the detector. Okay? 13 Now, you're asking me what light is 14 reflected by the cladding layer and what light is 15 transmitted by the cladding layer. 16 Q. No, I'm simply asking are cladding layers 372 17 and 376 reflective? Which it sounds like you agree 18 they are; correct? 19 MR. HAGIZ: Objection to form. 20 A. What I'm saying is, they're reflected for 21 the -- they will guide the light -- and I'm being very 22 precise here -- they will guide the light to the

13 1 appropriate detector. 2 Now, in terms of being reflective, we have 3 to quantify in saying where are they going to be 4 reflected and in what wavelength are they going to 5 reflect. And so I think you have to be very careful 6 about that. 7 And it must be remembered that when light 8 is coming in, somehow light just doesn't travel a 9 straight path to that detector, if you will. Okay? 10 So you're going to have to have some mechanism for 11 transporting that in. 12 And so the total aperture is the cladding 13 layer plus that -- it's 272, 274, and 276. And now 14 part of the light's going to be reflected and guided 15 by the index of refraction chosen for that cladding 16 layer, so that the right, appropriate wavelengths will 17 go to the detector. And then part of it will be 18 directed so that it's absorbed by the black layer of 19 unwanted radiation. 20 So you can choose that cladding layer as 21 the proper configuration for guiding that light in. 22 And so therefore it's part of our aperture. 14 1 Q. Thank you, Dr. Shanley. That's actually all 2 my questions for today. 3 MR. HAGIZ: Nothing for me. 4 (The deposition concluded at 12:09 p.m.) 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	15 1 CERTIFICATE OF SHORTHAND REPORTER - NOTARY PUBLIC 2 3 I, Alan H. Brock, Certified Reporter 4 and Notary Public within and for the Commonwealth of 5 Massachusetts, do hereby certify: 6 That James F. Shanley, Ph.D., the witness 7 whose deposition is hereinbefore set forth, was duly 8 sworn by me before the commencement of such deposition 9 and that such deposition was taken before me and is a 10 true record of the testimony given by such witness. 11 I further certify that the adverse 12 party, PETITIONER, was represented by counsel at 13 the deposition. 14 I further certify that the deposition 15 of James F. Shanley, Ph.D. occurred at the offices of 16 Cooley LLP on Wednesday, November 6, 2024, commencing 17 at 11:45 a.m. to 12:09 p.m. 18 I further certify that I am not 19 related to any of the parties to this action by blood 20 or marriage, I am not employed by or an attorney to 21 any of the parties to this action, and that I am in no 22 way interested, financially or otherwise, in the 16 1 outcome of this matter. 2 3 IN WITNESS WHEREOF, I have hereunto 4 set my hand this 8th day of November, 2024. 5 My commission expires: 6 March 25, 2027 7 8  9 10 Alan H. Brock, RDR, CRR 11 12 13 14 15 16 17 18 19 20 21 22
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