

1 UNITED STATES PATENT AND TRADEMARK OFFICE

2
3 BEFORE THE PATENT TRIAL AND APPEAL BOARD

4
5 MERCEDES-BENZ USA, LLC,

6 Petitioner

7 vs.

8 DAEDALUS PRIME LLC,

9 Patent Owner

10
11 Case No. IPR2023-01344

12 United States Patent No. 9,575,895

13
14
15
16 BEFORE:

17 Gail L. Inghram Verbano:

18 Registered Diplomate Reporter,

19 Certified Realtime Reporter,

20 Certified Shorthand Reporter-CA (No. 8635)

1 UNITED STATES PATENT AND TRADEMARK OFFICE

2
3 BEFORE THE PATENT TRIAL AND APPEAL BOARD

4
5 MERCEDES-BENZ USA, LLC,

6 Petitioner

7 vs.

8 DAEDALUS PRIME LLC,

9 Patent Owner

10
11 Case No. IPR2023-01344

12 United States Patent No. 9,575,895

13
14
15
16 Remote deposition of ROBERT W. HORST,
17 Ph.D., held via Zoom videoconferencing on
18 Tuesday, May 21, 2024, beginning at approximately
19 8:45 a.m. Pacific Time, the proceedings being
20 recorded stenographically by Gail Inghram,
21 Registered Diplomate Reporter, Certified Realtime
22 Reporter, Certified Shorthand Reporter-CA (No.
23 8635), and transcribed under her direction.
24
25

A P P E A R A N C E S

On behalf of Petitioner:

SCOTT HUGHES, ESQ.

scott.hughes@hoganlovells.com

KYLE XU, ESQ.

kyle.xu@hoganlovells.com

HOGAN LOVELLS US LLP

555 Thirteenth Street, N.W.

Washington, D.C. 20004-1109

202.637.5600

On behalf of Patent Owner:

TAREK N. FAHMI, ESQ.

tarek.fahmi@ascendalaw.com

ASCENDA LAW GROUP, PC

2150 North First Street, Suite 420

San Jose, California 95131

866.877.4883

ALSO PRESENT:

TOMAS REYES, Document Technician

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

C O N T E N T S

EXAMINATION OF:	PAGE
ROBERT W. HORST, PH.D.	
By Attorney Fahmi	5

E X H I B I T S

EXHIBIT:	PAGE
Exhibit 1003 Article titled "IBM POWER7	12
multicore server processor" by	
B. Sinharoy, et al.	
Exhibit 1007 Declaration of Robert W. Horst	9

1 5/21/2024 Deposition of ROBERT W. HORST, Ph.D.

2 Tuesday, May 21, 2024; 8:45 a.m.

3 - - -

4 WHEREUPON,

5 ROBERT W. HORST, Ph.D.,

6 being first duly sworn or affirmed to testify to the
7 truth, the whole truth, and nothing but the truth,
8 was examined and testified as follows:

9
10 EXAMINATION

11 BY ATTORNEY FAHMI:

12 Q. Good morning, Dr. Horst. Can you hear
13 me okay?

14 A. Yes.

15 Q. Great. I know we've spoken several
16 times in the last few days, but, again, my name
17 is Tarek Fahmi. I'm here representing the Patent
18 Owner, Daedalus Prime, and we're here today for
19 your deposition in connection with inter partes
20 review 2023-01344, pending in the United States
21 Patent and Trademark Office, and that proceeding
22 concerns the U.S. Patent 9,575,895.

23 Do you understand that?

24 A. Yes.

25 Q. And I understand you provided a

1 declaration in support of the petition in this
2 5/21/2024 Deposition of ROBERT W. HORST, Ph.D.
proceeding. Is that correct?

3 A. Yes.

4 Q. Again, I know we've spoken several
5 times the last few days, but just a reminder that
6 since we are conducting this proceeding -- this
7 deposition by video conference, it helps the
8 court reporter if she only has to hear one of us
9 speak at a time. So if you'd be so kind as to
10 wait until I finish asking the question before
11 you begin your answer, I'll try and do the same
12 and make sure that you've completed your answer
13 before I ask another question, and that will make
14 the court reporter's job a lot easier.

15 Is that okay?

16 A. Yes.

17 Q. And, again, as you're doing, if you'd
18 continue to give audible answers. That way it
19 will make for a clean transcript. And the court
20 reporter, she can't really take down gestures
21 over video, so audible answers, please.

22 Is that all right?

23 A. Yes.

24 Q. Do you have any materials in the room
25 with you today, Dr. Horst?

1 A. Yes. I have paper copies of the '895
2 5/21/2024 Deposition of ROBERT W. HORST, Ph.D.
3 patent, my expert report, and most of the
4 exhibits, including the Sinharoy and Tang
5 references.

6 Q. Are there any markings or annotations
7 on any of those exhibits?

8 A. No.

9 Q. It's fine if you would like to use
10 those to refer to during the proceeding. I just
11 ask that if you are reading from one of those
12 documents or you're referring to something in
13 particular, you let us know.

14 Okay?

15 A. Yes.

16 Q. Who's present in the room with you
17 today, Dr. Horst?

18 A. In the room is Mr. Hughes.

19 Q. Just a reminder that, now that we've
20 started the cross-examination portion of the
21 deposition, you're not to have any communications
22 with anyone concerning the substance of your
23 testimony, and that would apply even during a
24 break.

25 Do you understand?

 A. Yes.

1 Q. If you need to take a break at any
2 5/21/2024 Deposition of ROBERT W. HORST, Ph.D.
3 time, just let us know. I'm happy to do so. I
4 just ask that if there's a question pending at
5 that time, if you please answer the question
6 before we take that break.

7 Is that okay?

8 A. Yes.

9 Q. And if we do suffer any technical
10 difficulties or you're not able to hear a
11 question or you didn't understand a question,
12 again, just let me know. I'm happy to repeat it
13 if you didn't hear it; and if you need
14 clarification, I'll try and give you that
15 clarification.

16 Okay?

17 A. Okay.

18 Q. Is there any reason why you can't give
19 us your full, honest and complete testimony in
20 this matter today?

21 A. No.

22 Q. Let's turn to your expert declaration,
23 Dr. Horst. It's Exhibit 1007.

24 And if we could have that up on the
25 screen, please.

 THE DOCUMENT TECHNICIAN: No problem,

1 Counsel. Give me one second to bring that up for
2 5/21/2024 Deposition of ROBERT W. HORST, Ph.D.
you.

3 (Whereupon, Exhibit Number 1007 was
4 marked for identification and was
5 retained by counsel.)

6 THE DOCUMENT TECHNICIAN: And
7 Exhibit 1007 is on screen.

8 ATTORNEY FAHMI: Thank you.

9 BY ATTORNEY FAHMI:

10 Q. Dr. Horst, do you recognize this
11 exhibit?

12 A. Yes. This is my expert report in this
13 case.

14 Q. When is the last time you had a chance
15 to review it?

16 A. Yesterday.

17 Q. Okay. And if you need to review
18 anything this morning to refresh your
19 recollection, again, that's fine. Just let us
20 know, please.

21 If you would turn, please, to paragraph
22 29. It's on page 12.

23 A. Yes, I'm there.

24 Q. In paragraph 29, you indicate that you
25 applied the ordinary and customary meaning of the

1 claims as part of your analysis; is that right?

5/21/2024 Deposition of ROBERT W. HORST, Ph.D.

2 A. That's right.

3 Q. So does that mean you didn't apply any
4 special definitions to any of the terms of the
5 claims as part of your analysis?

6 A. I used the ordinary meaning in light of
7 the specification and prosecution history. So I
8 did refer to the specification as well to make
9 sure my understanding of those terms met with the
10 way they're described in the specification.

11 Q. And that was done from the standpoint
12 of a person of ordinary skill in the art; is that
13 right?

14 A. That's right.

15 Q. And in paragraph 30 you give us a
16 description of who that person of ordinary skill
17 in the art would be; is that correct?

18 A. That's correct.

19 Q. You indicate that that person would
20 have a certain level of undergraduate education
21 as well as some years of experience in various
22 fields, and that less experience might be made up
23 for with more education and vice versa; is that
24 correct?

25 A. That's correct.

1 Q. How did you decide that this would be a
2 5/21/2024 Deposition of ROBERT W. HORST, Ph.D.
3 description of a person of ordinary skill in the
4 art with respect to this patent?

5 A. The '895 patent is related to caches and
6 multiprocessor systems. And so I said that along
7 with an undergraduate degree, the person would
8 require "two years of experience working with
9 multicore processor systems, central processing
10 unit (CPU), cache, and memory systems."

11 Q. And what sort of experience would you
12 expect the person of ordinary skill in the art to
13 have gained during that time?

14 A. A person working in a multicore
15 processor or working with a multicore processor
16 would have understood how caches work and how
17 cache coherence works; and that's part of the
18 understanding needed to be able to understand the
19 '895 patent.

20 Q. In this context, what is a cache?

21 A. A cache is a high-speed memory that is
22 used to provide memory references more quickly to
23 a processor than if it had to go all the way to
24 the main memory to perform all those cache
25 references -- all those memory references.

26 Q. Let's turn to Exhibit 1003, please.

1 This is the Sinharoy reference, I think is how
2 5/21/2024 Deposition of ROBERT W. HORST, Ph.D.
you pronounce it.

3 THE DOCUMENT TECHNICIAN: Yes, please
4 stand by, Counsel.

5 THE WITNESS: Yes, I have it here.

6 (Whereupon, Exhibit Number 1003 was
7 marked for identification and was
8 retained by counsel.)

9 THE DOCUMENT TECHNICIAN: And
10 Exhibit 1003 is on screen.

11 ATTORNEY FAHMI: Thank you.

12 BY ATTORNEY FAHMI:

13 Q. Dr. Horst, do you recognize this
14 exhibit?

15 A. Yes.

16 Q. You recognize it as an article titled
17 "IBM POWER7 multicore server processor" by
18 Sinharoy, et al.; is that right?

19 A. That's correct.

20 Q. And I believe you offered testimony
21 concerning this reference as part of your
22 declaration; is that correct?

23 A. That's correct.

24 Q. When is the last time you had a chance
25 to review this reference?

1 A. Yesterday.
2 5/21/2024 Deposition of ROBERT W. HORST, Ph.D.

3 Q. So as I mentioned, on page 1 in the
4 abstract, you were advised that the article is
5 going to be discussing the IBM POWER7 multicore
6 processor; is that right?

7 A. That's right.

8 Q. Do you have any personal experience
9 with the IBM POWER7 multicore processor?

10 ATTORNEY HUGHES: Objection; vague.

11 THE WITNESS: No direct experience, but
12 I have read a number of papers about the POWER7.

13 BY ATTORNEY FAHMI:

14 Q. Again, in the article -- excuse me --
15 in the abstract, we're told that this particular
16 chip is an eight-core processor that has three
17 levels of on-chip cache. Is that correct?

18 A. I don't see those exact words. But that
19 is correct: It has three levels of cache.

20 Q. And on the fifth line of the abstract
21 we're told that the chip is an eight-core
22 processor.

23 Do you see that?

24 A. Yes.

25 Q. And if you take a look at the table on
26 the top of page 16 of the article that's labeled

1 Table 1 -- do you see that?

5/21/2024 Deposition of ROBERT W. HORST, Ph.D.

2 A. Yes.

3 Q. On the right-hand side of that table
4 there's a brief description of the various levels
5 of the caches in the POWER7 processor; is that
6 right?

7 A. This is a short summary. Although where
8 it's talking about the L3 cache, there's much more
9 description in the full text about the L3 cache.

10 Q. What do the designations L1, L2, and L3
11 mean?

12 A. L1 means level 1. It's the cache that's
13 the closest to the core. And then Level 2 are
14 caches that are shared among the cores, and -- or
15 I'm sorry. Level 3 is the highest level or the
16 last level cache, in Sinharoy.

17 Q. If you turn to page 17 there's a
18 paragraph that begins, "The POWER6 cache
19 hierarchy." It's the first full paragraph in the
20 left-hand column.

21 Do you see that?

22 A. Yes, I see that.

23 Q. So I think this paragraph is comparing
24 the previous POWER6 cache hierarchy, the POWER7
25 cache hierarchy; and about halfway through the

1 paragraph there's a sentence that begins,
2 5/21/2024 Deposition of ROBERT W. HORST, Ph.D.
3 "Therefore, the POWER7 cache hierarchy includes a
4 shared 32-megabyte L3 cache."

5 Do you see that?

6 A. Yes.

7 Q. So that's what you were referring to
8 with the L3 cache when we were talking about the
9 table; right?

10 A. Yes. Yes. It's a 32-megabyte L3 cache
11 with local L3 regions.

12 Q. Turn to the next page, page 18.
13 There's a section that begins "L2 Cache."

14 Do you see that?

15 A. Yes.

16 Q. In the second sentence of that
17 paragraph, under the "L2 Cache" heading, we're
18 advised that the L2 cache "is comprised of a
19 single centralized controller, with two
20 address-hashed cache data arrays"; is that right?

21 A. That's what it says there, although
22 reading the full specification, the centralized L2
23 caches actually coordinate with each other so
24 they -- there is -- they're not completely
25 independent of each other.

Q. Each L2 cache has its own single

1 centralized controller though; is that right?
5/21/2024 Deposition of ROBERT W. HORST, Ph.D.

2 A. Each L2 cache has its own controller,
3 which coordinates with the other controllers.

4 Q. And on the next page, page 19, there's
5 a heading for L3 cache.

6 Do you see that?

7 A. Yes.

8 Q. And we're advised that each L3 cache
9 also has its own cache controller; is that right?

10 ATTORNEY HUGHES: Objection to the
11 extent it mischaracterizes.

12 THE WITNESS: Each L3 region has a cache
13 controller, but that is -- coordinates with the
14 other cache controllers in the other regions to
15 form a single controller for the entire L3.

16 BY ATTORNEY FAHMI:

17 Q. That's your opinion; right? That's not
18 what it says in this paragraph; correct?

19 A. It doesn't say it in this paragraph.
20 But if you go to page 20 at the top, it says:

21 "When the associated core and L2
22 are enabled, a number of heuristics
23 cooperate to give precedence to the
24 associated L2 cache while allowing load
25 and capacity balancing among all eight

1 L3 regions on the chip, thereby causing
2 5/21/2024 Deposition of ROBERT W. HORST, Ph.D.
3 them to behave as a highly

4 set-associative (64-way) adaptive 32
5 megabyte L3 cache."

6 And the coordinating to do capacity
7 balancing means that there has to be a centralized
8 controller for all the caches to do that load
9 balancing.

10 Q. The caches can't cooperate with one
11 another to do the load balancing?

12 A. The caches can't independently handle
13 read and write misses without coordinating with
14 the other caches, so there has to be some
15 high-level logic that does that coordination.

16 Q. Well, actually, look back at page 19,
17 Dr. Horst. And in the right-hand column, the
18 paragraph about midway down that begins "Storage
19 accesses that miss."

20 Do you see that?

21 A. Yes.

22 Q. So Sinharoy says exactly the opposite
23 of what you just said here, doesn't it? It says
24 that "Storage accesses that miss the L2 and the
25 local L3 are broadcast to the coherence fabric
and snooped by the memory controller, other L2

1 caches, and possibly other L3 caches," doesn't
2 5/21/2024 Deposition of ROBERT W. HORST, Ph.D.
it?

3 A. Where it says "possibly other L3 caches"
4 means that it doesn't act independently; it has to
5 know whether the lines in its local L3 region are
6 held in any other L3 regions. So it can't operate
7 independently; it has to have knowledge and each
8 of them have to have knowledge of what are in the
9 other regions as well.

10 Q. Each of them have to have knowledge of
11 what's in the other region so that the caches can
12 maintain coherence; correct?

13 A. It needs that knowledge to be able to
14 avoid snooping in the other L3 regions that are
15 known not to have the data lines so that it can
16 reduce the snoop traffic.

17 Q. Well, the paragraph doesn't say
18 anything about reducing snoop traffic. It says
19 that it snoops the other L3 caches, doesn't it?

20 A. This paragraph is a generalization of
21 that. But there's other evidence in this document
22 that one of the objectives here is to reduce the
23 snoop traffic.

24 Q. What are you referring to?

25 A. If you look at the -- on page 17, if you

1 look at the Table 2 that describes all of the
2 5/21/2024 Deposition of ROBERT W. HORST, Ph.D.
3 cache states, the -- there's a column there that
4 says "Sharers and scope;" and the last two cache
5 states say that it may be shared but it's
6 guaranteed to be local.

7 So when a cache line is in that state,
8 the snoops can avoid snooping the other L3
9 regions, and they only have to -- so the snoops
10 don't have to go to the other L3s in that case.

11 Q. Where does it say the snoops don't have
12 to go to the other L3s in those cases?

13 (Pause.)

14 A. The reduction in the snoop -- I don't
15 see the specific reference in the text, but
16 someone that understands that table would
17 understand that it could avoid snoops in that
18 cases [sic]. I believe the explanation is a
19 little bit clearer in some of the POWER6 documents
20 that are describing the same type of cache
21 structure with the same set of cache states.

22 Q. The table on page 17 that you're
23 referring to, one of the columns is labeled "Data
24 Cast-out."

25 Do you see that?

A. Yes.

1 Q. What does "cast-out" mean in that
2 5/21/2024 Deposition of ROBERT W. HORST, Ph.D.
context?

3 A. Cast-out means when the cache line is
4 being replaced, whether it has to -- the
5 information stored in the cache line being
6 replaced needs to be written somewhere else,
7 either into main memory or into another cache.

8 ATTORNEY FAHMI: Okay. Thanks,
9 Dr. Horst. I don't have any other questions for
10 you today.

11 THE WITNESS: Thank you.

12 ATTORNEY HUGHES: All right. Can we
13 take a five-minute break? We just want to discuss
14 some things on our end, and we'll be right back.

15 ATTORNEY FAHMI: Sure thing.

16 (Recess taken from 9:12 a.m. to
17 9:14 a.m.)

18 ATTORNEY HUGHES: We have no questions.

19 THE COURT REPORTER: Do you want the
20 rough draft?

21 ATTORNEY FAHMI: Yes, please, Gail. I
22 think we asked for the ASCII rough and then a
23 48-hour turn on the transcript.

24 THE COURT REPORTER: Mr. Hughes?

25 ATTORNEY HUGHES: Rough draft today

1 would be great, and then we'll take the transcript
2 5/21/2024 Deposition of ROBERT W. HORST, Ph.D.
just on regular time.

3 (Whereupon, at 9:15 a.m. the
4 proceedings concluded.)
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

INSTRUCTIONS TO DEPONENT

After reading this volume of your deposition, indicate any corrections or changes to your testimony and the reasons therefor on the Errata Sheet supplied to you and sign it. DO NOT make marks or notations on the transcript volume itself.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

E R R A T A

I wish to make the following changes,

for the following reasons:

Page Line

_____ CHANGE: _____

REASON: _____

_____ CHANGE: _____

REASON: _____

_____ CHANGE: _____

REASON: _____

_____ CHANGE: _____

REASON: _____

_____ CHANGE: _____

REASON: _____

_____ CHANGE: _____

REASON: _____

_____ CHANGE: _____

REASON: _____

_____ CHANGE: _____

REASON: _____

_____ CHANGE: _____

REASON: _____

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

C E R T I F I C A T I O N

I hereby certify that I have read the
foregoing transcript of my deposition testimony,
and that my answers to the questions propounded,
with the attached corrections or changes, if any,
are true and correct.

ROBERT W. HORST, PH.D.

1 CERTIFICATE OF SHORTHAND REPORTER

2 I, Gail Inghram, Registered Diplomate
3 Reporter, Certified Realtime Reporter, Realtime
4 Systems Administrator, CA-Certified Shorthand
5 Reporter No. 8635, and Notary Public, the officer
6 before whom the foregoing proceedings were taken,
7 do hereby certify that the foregoing transcript
8 is a true and correct record of the proceedings;
9 that said proceedings were taken by me
10 stenographically and thereafter reduced to
11 typewriting under my supervision; and that I am
12 neither counsel for, related to, nor employed by
13 any of the parties to this case and have no
14 interest, financial or otherwise, in its outcome.

15 I further certify that the adverse party,
16 Mercedes-Benz, was represented by counsel at the
17 deposition.

18 I further certify that the deposition of
19 ROBERT W. HORST, PhD, occurred virtually on
20 Tuesday, May 21, 2024, commencing at 8:45 a.m. to
21 9:15 a.m. (PT).

22 *Gail Inghram*
23

24 _____
25 Gail Inghram,
BA, RDR, CRR, RSA, CA-CSR No. 8635

A			
able 8:10, 11:18, 18:14	also 3:23, 16:10	ascii 20:23	being 2:19, 5:6, 20:5, 20:6
about 13:12, 14:9, 14:10, 14:26, 15:8, 17:18, 18:19	although 14:8, 15:21	asked 20:23	believe 12:21, 19:18
abstract 13:4, 13:15, 13:20	among 14:15, 16:26	asking 6:11	bit 19:19
accesses 17:19, 17:24	analysis 10:1, 10:6	associated 16:22, 16:25	board 1:3, 2:3
act 18:5	annotations 7:6	attached 24:7	break 7:24, 8:1, 8:6, 20:14
actually 15:23, 17:16	another 6:14, 17:11, 20:8	attorney 4:4, 5:11, 9:9, 9:10, 12:12, 12:13, 13:10, 13:13, 16:11, 16:17, 20:9, 20:13, 20:16, 20:19, 20:22, 20:26	brief 14:5
adaptive 17:4	answer 6:12, 6:13, 8:5	audible 6:19, 6:22	bring 9:1
address-hashed 15:20	answers 6:19, 6:22, 24:6	avoid 18:15, 19:8, 19:17	broadcast 17:25
administrator 25:4	any 6:25, 7:6, 7:7, 7:21, 8:1, 8:9, 8:18, 10:4, 10:5, 13:8, 18:7, 20:10, 22:3, 24:7, 25:13	B	C
adverse 25:15	anyone 7:22	ba 25:26	ca-certified 25:4
advised 13:4, 15:18, 16:9	anything 9:19, 18:19	back 17:16, 20:15	ca-csr 25:26
affirmed 5:6	appeal 1:3, 2:3	balancing 16:26, 17:7, 17:9, 17:11	cache 11:10, 11:17, 11:20, 11:21, 11:24, 13:17, 13:19, 14:9, 14:10, 14:13, 14:17, 14:19, 14:25, 14:26, 15:3, 15:4, 15:8, 15:10, 15:13, 15:17, 15:18, 15:20, 15:26, 16:3, 16:6, 16:9, 16:10, 16:13, 16:15, 16:25, 17:5, 19:3, 19:4, 19:7, 19:20, 19:21, 20:4, 20:6, 20:8
after 22:2	applied 9:26	before 1:3, 1:16, 2:3, 6:11, 6:14, 8:6, 25:6	caches 11:5, 11:16, 14:6, 14:15, 15:23, 17:8,
again 5:16, 6:5, 6:18, 8:12, 9:20, 13:14	apply 7:23, 10:4	begin 6:12	
al 4:13, 12:19	approximately 2:18	beginning 2:18	
all 6:23, 11:23, 11:24, 11:25, 16:26, 17:8, 19:1, 20:13	arrays" 15:20	begins 14:19, 15:1, 15:13, 17:18	
allowing 16:25	art 10:13, 10:18, 11:4, 11:12	behalf 3:3, 3:14	
along 11:6	article 4:11, 12:17, 13:4, 13:14, 13:26	behave 17:3	
	ascenda 3:17		

17:10, 17:12, 17:14, 18:1, 18:4, 18:12, 18:20 california 3:19 can't 6:21, 8:18, 17:10, 17:12, 18:7 capacity 16:26, 17:6 case 1:11, 2:11, 9:14, 19:10, 25:13 cases 19:12, 19:18 cast-out 19:24, 20:1, 20:4 causing 17:1 central 11:9 centralized 15:19, 15:22, 16:1, 17:7 certain 10:21 certificate 25:1 certified 1:19, 1:20, 2:21, 2:22, 25:3 certify 24:4, 25:7, 25:15, 25:18 chance 9:15, 12:25 change 23:6, 23:8, 23:10, 23:12, 23:14, 23:16, 23:18, 23:20, 23:22 changes 22:3, 23:3,	24:7 chip 13:16, 13:21, 17:1 claims 10:1, 10:6 clarification 8:14, 8:15 clean 6:20 clearer 19:19 closest 14:14 coherence 11:17, 17:25, 18:13 column 14:21, 17:17, 19:3 columns 19:23 com 3:5, 3:7, 3:16 commencing 25:20 communications 7:21 comparing 14:24 complete 8:19 completed 6:13 completely 15:24 comprised 15:18 concerning 7:22, 12:22 concerns 5:22 concluded 21:5 conducting 6:7 conference 6:8	connection 5:19 context 11:20, 20:3 continue 6:19 controller 15:19, 16:1, 16:3, 16:10, 16:14, 16:16, 17:8, 17:26 controllers 16:4, 16:15 cooperate 16:24, 17:10 coordinate 15:23 coordinates 16:4, 16:14 coordinating 17:6, 17:13 coordination 17:15 copies 7:1 core 14:14, 16:22 cores 14:15 correct 6:3, 10:18, 10:19, 10:25, 10:26, 12:20, 12:23, 12:24, 13:17, 13:19, 16:19, 18:13, 24:8, 25:8 corrections 22:3, 24:7 could 8:24, 19:17 counsel 9:1, 9:6, 12:5, 12:9, 25:12, 25:16 court 6:9, 6:15, 6:20, 20:20,	20:25 cpu 11:10 cross-examination 7:20 crr 25:26 customary 9:26 D daedalus 1:8, 2:8, 5:18 data 15:20, 18:16, 19:23 days 5:16, 6:6 decide 11:1 declaration 4:15, 6:1, 8:22, 12:23 definitions 10:5 degree 11:7 deponent 22:1 deposition 2:16, 5:1, 5:19, 6:2, 6:8, 7:2, 7:21, 8:2, 9:2, 10:2, 11:2, 12:2, 13:2, 14:2, 15:2, 16:2, 17:2, 18:2, 19:2, 20:2, 21:2, 22:3, 24:5, 25:17, 25:18 described 10:11 describes 19:1 describing 19:20 description 10:17, 11:3,
--	---	---	--

14:5, 14:10 designations 14:11 difficulties 8:10 diplomate 1:18, 2:21, 25:2 direct 13:11 direction 2:23 discuss 20:14 discussing 13:5 document 3:24, 8:26, 9:7, 12:4, 12:10, 18:22 documents 7:12, 19:19 doing 6:18 done 10:12 down 6:21, 17:18 dr 5:12, 6:26, 7:17, 8:23, 9:11, 12:14, 17:17, 20:10 draft 20:21, 20:26 duly 5:6 during 7:10, 7:23, 11:13	education 10:21, 10:24 eight 16:26 eight-core 13:16, 13:21 either 20:8 else 20:7 employed 25:12 enabled 16:23 end 20:15 entire 16:16 errata 22:5 esq 3:4, 3:6, 3:15 et 4:13, 12:19 even 7:23 evidence 18:22 exact 13:18 exactly 17:22 examination 4:2, 5:10 examined 5:8 excuse 13:14 exhibit 4:10, 4:11, 4:15, 8:23, 9:4, 9:8, 9:12, 11:26, 12:7, 12:11, 12:15 exhibits 7:4, 7:7 expect 11:12	experience 10:22, 10:23, 11:8, 11:11, 13:8, 13:11 expert 7:3, 8:22, 9:13 explanation 19:18 extent 16:12	full 8:19, 14:10, 14:20, 15:22 further 25:15, 25:18
E		F	G
each 15:23, 15:25, 15:26, 16:3, 16:9, 16:13, 18:8, 18:11 easier 6:15		fabric 17:25 fahmi 3:15, 4:4, 5:11, 5:17, 9:9, 9:10, 12:12, 12:13, 13:13, 16:17, 20:9, 20:16, 20:22 fahmi@ascendalaw 3:16 few 5:16, 6:6 fields 10:23 fifth 13:20 financial 25:14 fine 7:9, 9:20 finish 6:11 first 3:18, 5:6, 14:20 five-minute 20:14 following 23:3, 23:4 follows 5:8 foregoing 24:5, 25:6, 25:7 form 16:16	gail 1:17, 2:20, 20:22, 25:2, 25:25 gained 11:13 generalization 18:21 gestures 6:21 give 6:19, 8:14, 8:18, 9:1, 10:16, 16:24 go 11:23, 16:21, 19:10, 19:12 going 13:5 good 5:12 great 5:15, 21:1 group 3:17 guaranteed 19:6
			H
			halfway 14:26 handle 17:12 happy 8:3, 8:12 heading 15:17, 16:6 hear 5:12, 6:9, 8:10, 8:13 held 2:17, 18:7

helps 6:8 here 5:17, 5:18, 12:6, 17:23, 18:23 hereby 24:4, 25:7 heuristics 16:23 hierarchy 14:20, 14:25, 14:26, 15:3 high-level 17:15 high-speed 11:21 highest 14:16 highly 17:3 history 10:8 hogan 3:8 honest 8:19 horst 2:16, 4:3, 4:15, 5:1, 5:5, 5:12, 6:2, 6:26, 7:2, 7:17, 8:2, 8:23, 9:2, 9:11, 10:2, 11:2, 12:2, 12:14, 13:2, 14:2, 15:2, 16:2, 17:2, 17:17, 18:2, 19:2, 20:2, 20:10, 21:2, 24:13, 25:19 hour 20:24 hughes 3:4, 7:18, 13:10, 16:11, 20:13, 20:19,	20:25, 20:26 hughes@hoganlove-lls 3:5 I ibm 4:11, 12:18, 13:5, 13:9 identification 9:5, 12:8 includes 15:3 including 7:4 independent 15:25 independently 17:12, 18:5, 18:8 indicate 9:25, 10:20, 22:3 information 20:6 ingram 1:17, 2:20, 25:2, 25:25 instructions 22:1 inter 5:19 interest 25:14 ipr 1:11, 2:11 itself 22:7 J job 6:15 jose 3:19 K kind 6:10	know 5:15, 6:5, 7:13, 8:3, 8:12, 9:21, 18:6 knowledge 18:8, 18:9, 18:11, 18:14 known 18:16 kyle 3:6, 3:7 L ll 14:11, 14:13 l2 14:11, 15:13, 15:17, 15:18, 15:22, 15:26, 16:3, 16:22, 16:25, 17:24, 17:26 l3 14:9, 14:10, 14:11, 15:4, 15:8, 15:10, 15:11, 16:6, 16:9, 16:13, 16:16, 17:1, 17:5, 17:25, 18:1, 18:4, 18:6, 18:7, 18:15, 18:20, 19:8 l3s 19:10, 19:12 labeled 13:26, 19:23 last 5:16, 6:6, 9:15, 12:25, 14:17, 19:4 law 3:17 left-hand 14:21 less 10:23	let's 8:22, 11:26 level 10:21, 14:13, 14:14, 14:16, 14:17 levels 13:17, 13:19, 14:5 light 10:7 line 13:20, 19:7, 20:4, 20:6, 23:5 lines 18:6, 18:16 little 19:19 llc 1:5, 1:8, 2:5, 2:8 llp 3:8 load 16:25, 17:8, 17:11 local 15:11, 17:25, 18:6, 19:6 logic 17:15 look 13:25, 17:16, 18:26, 19:1 lot 6:15 lovells 3:8 M made 10:23 main 11:24 maintain 18:13 make 6:13, 6:14,
---	---	--	--

6:20, 10:9, 22:6, 23:3 marked 9:5, 12:8 markings 7:6 marks 22:6 materials 6:25 matter 8:20 mean 10:4, 14:12, 20:1, 20:8 meaning 9:26, 10:7 means 14:13, 17:7, 18:5, 20:4 megabyte 15:4, 15:10, 17:5 memory 11:10, 11:21, 11:22, 11:24, 11:25, 17:26, 20:8 mentioned 13:3 mercedes-benz 1:5, 2:5, 25:16 met 10:10 midway 17:18 might 10:23 mischaracterizes 16:12 miss 17:19, 17:24 misses 17:13 more 10:24, 11:22, 14:9 morning 5:12, 9:19	most 7:3 much 14:9 multicore 4:12, 11:9, 11:14, 11:15, 12:18, 13:5, 13:9 multiprocessor 11:6 N name 5:16 need 8:1, 8:13, 9:18 needed 11:18 needs 18:14, 20:7 neither 25:12 next 15:12, 16:5 north 3:18 notary 25:5 notations 22:6 nothing 5:7 number 9:4, 12:7, 13:12, 16:23 O objection 13:10, 16:11 objectives 18:23 occurred 25:19 offered 12:21 office 1:1, 2:1, 5:21	officer 25:5 okay 5:13, 6:16, 7:14, 8:7, 8:16, 8:17, 9:18, 20:9 on-chip 13:17 one 6:9, 7:11, 9:1, 17:10, 18:23, 19:23 only 6:9, 19:9 operate 18:7 opinion 16:18 opposite 17:22 ordinary 9:26, 10:7, 10:13, 10:17, 11:3, 11:12 other 15:23, 15:25, 16:4, 16:15, 17:14, 17:26, 18:1, 18:4, 18:7, 18:10, 18:12, 18:15, 18:20, 18:22, 19:8, 19:10, 19:12, 20:10 otherwise 25:14 outcome 25:14 over 6:22 own 15:26, 16:3, 16:10 owner 1:9, 2:9, 3:14, 5:18 P pacific 2:19	page 4:2, 4:10, 9:23, 13:3, 13:26, 14:18, 15:12, 16:5, 16:21, 17:16, 18:26, 19:22, 23:5 paper 7:1 papers 13:12 paragraph 9:22, 9:25, 10:16, 14:19, 14:20, 14:24, 15:1, 15:17, 16:19, 16:20, 17:18, 18:18, 18:21 part 10:1, 10:6, 11:17, 12:22 partes 5:19 particular 7:13, 13:15 parties 25:13 party 25:15 patent 1:1, 1:3, 1:9, 1:12, 2:1, 2:3, 2:9, 2:12, 3:14, 5:17, 5:21, 5:22, 7:3, 11:4, 11:5, 11:19 pause 19:13 pc 3:17 pending 5:20, 8:4 perform 11:24 person 10:13, 10:17,
--	--	--	---

10:20, 11:3, 11:7, 11:12, 11:14 personal 13:8 petition 6:1 petitioner 1:6, 2:6, 3:3 ph 2:17, 4:3, 5:1, 5:5, 6:2, 7:2, 8:2, 9:2, 10:2, 11:2, 12:2, 13:2, 14:2, 15:2, 16:2, 17:2, 18:2, 19:2, 20:2, 21:2, 24:13 phd 25:19 please 6:22, 8:5, 8:25, 9:21, 9:22, 11:26, 12:4, 20:22 portion 7:20 possibly 18:1, 18:4 power6 14:19, 14:25, 19:19 power7 4:11, 12:18, 13:5, 13:9, 13:12, 14:6, 14:25, 15:3 precedence 16:24 present 3:23, 7:16 previous 14:25 prime 1:8, 2:8, 5:18 problem 8:26	proceeding 5:21, 6:3, 6:7, 7:10 proceedings 2:19, 21:5, 25:6, 25:8, 25:9 processing 11:9 processor 4:12, 11:9, 11:15, 11:23, 12:18, 13:6, 13:9, 13:16, 13:22, 14:6 pronounce 12:3 propounded 24:6 prosecution 10:8 provide 11:22 provided 5:25 pt 25:21 public 25:5 Q question 6:11, 6:14, 8:4, 8:5, 8:11 questions 20:10, 20:19, 24:6 quickly 11:22 R rdr 25:26 read 13:12, 17:13, 24:4 reading 7:11, 15:22, 22:2	really 6:21 realtime 1:19, 2:21, 25:3 reason 8:18, 23:7, 23:9, 23:11, 23:13, 23:15, 23:17, 23:19, 23:21, 23:23 reasons 22:4, 23:4 recess 20:17 recognize 9:11, 12:14, 12:17 recollection 9:20 record 25:8 recorded 2:20 reduce 18:17, 18:23 reduced 25:10 reducing 18:19 reduction 19:14 refer 7:10, 10:9 reference 12:1, 12:22, 12:26, 19:15 references 7:5, 11:22, 11:25 referring 7:12, 15:7, 18:25, 19:23 refresh 9:19 region 16:13, 18:6, 18:12	regions 15:11, 16:15, 17:1, 18:7, 18:10, 18:15, 19:9 registered 1:18, 2:21, 25:2 regular 21:3 related 11:5, 25:12 reminder 6:6, 7:19 remote 2:16 repeat 8:12 replaced 20:5, 20:7 report 7:3, 9:13 reporter 1:18, 1:19, 2:21, 2:22, 6:9, 6:21, 20:20, 20:25, 25:1, 25:3, 25:5 reporter's 6:15 reporter-ca 1:20, 2:22 represented 25:16 representing 5:17 require 11:8 respect 11:4 retained 9:6, 12:9 review 5:20, 9:16, 9:18, 12:26 reyes 3:24 right 6:23, 10:1,
--	--	--	--

10:3, 10:14, 10:15, 12:19, 13:6, 13:7, 14:7, 15:9, 15:20, 16:1, 16:10, 16:18, 20:13, 20:15 right-hand 14:4, 17:17 robert 2:16, 4:3, 4:15, 5:1, 5:5, 6:2, 7:2, 8:2, 9:2, 10:2, 11:2, 12:2, 13:2, 14:2, 15:2, 16:2, 17:2, 18:2, 19:2, 20:2, 21:2, 24:13, 25:19 room 6:25, 7:16, 7:18 rough 20:21, 20:23, 20:26 rsa 25:26 S said 11:6, 17:23, 25:9 same 6:12, 19:20, 19:21 san 3:19 say 16:20, 18:18, 19:5, 19:11 says 15:21, 16:19, 16:21, 17:22, 17:23, 18:4, 18:19, 19:4 scope 19:4	scott 3:4, 3:5 screen 8:25, 9:8, 12:11 second 9:1, 15:16 section 15:13 see 13:18, 13:23, 14:1, 14:22, 14:23, 15:5, 15:14, 16:7, 17:20, 19:15, 19:25 sentence 15:1, 15:16 server 4:12, 12:18 set 19:21 set-associative 17:4 several 5:15, 6:5 shared 14:15, 15:4, 19:5 sharers 19:4 sheet 22:5 short 14:8 shorthand 1:20, 2:22, 25:1, 25:4 sic 19:18 side 14:4 sign 22:5 signature-plkal 25:22 since 6:7	single 15:19, 15:26, 16:16 sinharoy 4:13, 7:4, 12:1, 12:19, 14:17, 17:22 skill 10:13, 10:17, 11:3, 11:12 snoop 18:17, 18:19, 18:24, 19:14 snooped 17:26 snooping 18:15, 19:8 snoops 18:20, 19:8, 19:9, 19:11, 19:17 some 10:22, 17:14, 19:19, 20:15 someone 19:16 something 7:12 somewhere 20:7 sorry 14:16 sort 11:11 speak 6:10 special 10:5 specific 19:15 specification 10:8, 10:9, 10:11, 15:22 spoken 5:15, 6:5 stand 12:5 standpoint 10:12	started 7:20 state 19:7 states 1:1, 1:12, 2:1, 2:12, 5:20, 19:3, 19:5, 19:21 stenographically 2:20, 25:10 storage 17:18, 17:24 stored 20:6 street 3:9, 3:18 structure 19:21 substance 7:22 suffer 8:9 suite 3:18 summary 14:8 supervision 25:11 supplied 22:5 support 6:1 sure 6:13, 10:10, 20:16 sworn 5:6 systems 11:6, 11:9, 11:10, 25:4 T table 13:25, 14:1, 14:4, 15:9, 19:1, 19:16, 19:22
---	--	---	---

take 6:21, 8:1, 8:6, 13:25, 20:14, 21:1 taken 20:17, 25:6, 25:9 talking 14:9, 15:8 tang 7:4 tarek 3:15, 3:16, 5:17 technical 8:9 technician 3:24, 8:26, 9:7, 12:4, 12:10 terms 10:5, 10:10 testified 5:8 testify 5:6 testimony 7:23, 8:19, 12:21, 22:4, 24:5 text 14:10, 19:15 thank 9:9, 12:12, 20:12 thanks 20:9 thereafter 25:10 thereby 17:1 therefor 22:4 therefore 15:3 thing 20:16 things 20:15	think 12:1, 14:24, 20:23 thirteenth 3:9 three 13:16, 13:19 through 14:26 time 2:19, 6:10, 8:3, 8:5, 9:15, 11:13, 12:25, 21:3 times 5:16, 6:6 titled 4:11, 12:17 today 5:18, 6:26, 7:17, 8:20, 20:11, 20:26 told 13:15, 13:21 tomas 3:24 top 13:26, 16:21 trademark 1:1, 2:1, 5:21 traffic 18:17, 18:19, 18:24 transcribed 2:23 transcript 6:20, 20:24, 21:1, 22:6, 24:5, 25:7 trial 1:3, 2:3 true 24:8, 25:8 truth 5:7 try 6:12, 8:14 tuesday 2:18, 5:2,	25:20 turn 8:22, 9:22, 11:26, 14:18, 15:12, 20:24 two 11:8, 15:19, 19:4 type 19:20 typewriting 25:11 U under 2:23, 15:17, 25:11 undergraduate 10:21, 11:7 understand 5:23, 5:25, 7:25, 8:11, 11:18, 19:17 understanding 10:10, 11:18 understands 19:16 understood 11:16 unit 11:10 united 1:1, 1:12, 2:1, 2:12, 5:20 until 6:11 usa 1:5, 2:5 use 7:9 V vague 13:10 various 10:22, 14:5 verbano 1:17	versa 10:24 via 2:17 vice 10:24 video 6:8, 6:22 videoconferencing 2:17 virtually 25:19 volume 22:2, 22:6 vs 1:7, 2:7 W wait 6:11 want 20:14, 20:20 washington 3:10 way 6:19, 10:11, 11:23, 17:4 we'll 20:15, 21:1 we're 5:18, 13:15, 13:21, 15:17, 16:9 we've 5:15, 6:5, 7:19 whereupon 5:4, 9:4, 12:7, 21:4 whether 18:6, 20:5 whole 5:7 wish 23:3 without 17:13 witness 12:6, 13:11,
---	--	--	--

16:13, 20:12 words 13:18 work 11:16 working 11:8, 11:14, 11:15 works 11:17 write 17:13 written 20:7	12:7, 12:11 1007 4:15, 8:23, 9:4, 9:8 1109 3:10 12 9:23, 20:17 14 20:18 15 21:4, 25:21 16 13:26 17 14:18, 18:26, 19:22 18 15:12 19 16:5, 17:16	16:2, 17:2, 18:2, 19:2, 20:2, 21:2, 25:20 2150 3:18 29 9:23, 9:25 3 30 10:16 32 15:4, 15:10, 17:4 4 420 3:18 45 2:19, 5:2, 25:20 48 20:24 5 555 3:9 6 64 17:4 8 2:19, 5:2, 25:20 8635 1:20, 2:23, 25:5, 25:26 866.877 3:20 895 7:1, 11:5, 11:19 9 20:17, 20:18,	21:4, 25:21 9,575,895 1:12, 2:12, 5:22 95131 3:19
X			
xu 3:6 xu@hoganlovells 3:7			
Y			
years 10:22, 11:8 yesterday 9:17, 13:1			
Z			
zoom 2:17			
.			
.12 4:11 .4883 3:20 .5 4:4 .5600 3:11 .9 4:15	20 16:21 20004 3:10 202.637 3:11 2023 1:11, 2:11, 5:20 2024 2:18, 5:1, 5:2, 6:2, 7:2, 8:2, 9:2, 10:2, 11:2, 12:2, 13:2, 14:2, 15:2, 16:2, 17:2, 18:2, 19:2, 20:2, 21:2, 25:20 21 2:18, 5:1, 5:2, 6:2, 7:2, 8:2, 9:2, 10:2, 11:2, 12:2, 13:2, 14:2, 15:2,		
0			
01344 1:11, 2:11, 5:20			
1			
1003 4:11, 11:26,			