STC.UNM v. Intel Corporation Doc. 149 Att. 1

1 UNITED STATES DISTRICT COURT
2 DISTRICT OF NEW MEXICO
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5 STC.UNM,)
Plaintiff,)
6) Case No.: 10-CV-01077-RV-DWS
vs.) Volume 1
7) Pages 1 to 149
INTEL CORPORATION,)
8 Defendant.)
____________________________)
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13 DEPOSITION OF CHRIS MACK
14 Thursday, September 15, 2011
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17 Reported by:
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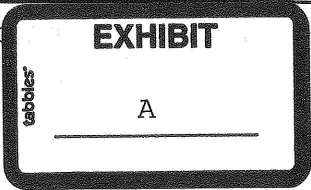

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08:45:15 1 Q. So when you testified that one of the
08:45:18 2 guidelines of claim construction is that a construction
08:45:22 3 shouldn't exclude embodiments, how do you reconcile that
08:45:31 4 with the fact that there may be some embodiments covered
08:45:33 5 by a claim and some embodiments that aren't?
08:45:36 6 MR. PEDERSEN: Same objection.
08:45:40 7 THE WITNESS: Construction should not exclude
08:45:44 8 an embodiment from all of the claims. So that the
08:45:51 9 embodiment is not claimed at all by the patent.
08:45:55 10 BY MR. FERRALL:
08:45:55 11 Q. So you believe that every embodiment should be
08:45:57 12 claimed somewhere in a patent?
08:46:00 13 MR. PEDERSEN: Same objection.
08:46:02 14 THE WITNESS: It's my understanding that
08:46:03 15 that's the case.
08:46:03 16 BY MR. FERRALL:
08:46:10 17 Q. Do you have any opinion as to how your
08:46:12 18 conclusions about claim construction would change if the
08:46:16 19 court were to decide and to rule in this case that it is
08:46:20 20 not the law that every embodiment must be claimed in a
08:46:24 21 patent?
08:46:25 22 MR. PEDERSEN: Objection to form.
08:46:28 23 THE WITNESS: No, I do not know how that would
08:46:30 24 affect my claim construction.
08:47:08 25 BY MR. FERRALL:

08:54:41 1 by claim 1 of the '998 patent?
08:54:48 2 **A. It may be covered by claim 1. But I don't**
08:54:50 3 **have an opinion.**
08:54:53 4 Q. Okay. If -- if claim 1 did cover Figure 8 of
08:54:58 5 the '998 patent, how would that affect your critique of
08:55:02 6 Intel's construction of the combined mask claim term?
08:55:07 7 MR. PEDERSEN: Objection; form.
08:55:09 8 THE WITNESS: Well, it wouldn't change my
08:55:11 9 opinion about the construction. It may change whether
08:55:19 10 or not I include the criticism of reading out this
08:55:23 11 embodiment.
08:55:25 12 BY MR. FERRALL:
08:55:29 13 Q. Dr. Mack, do you have any opinion about -- or
08:55:34 14 do you have any view about how your opinion would change
08:55:38 15 if the court were to determine in this case as a matter
08:55:46 16 of law that it is not necessary that every embodiment in
08:55:52 17 a patent be claimed by at least one claim?
08:55:56 18 MR. PEDERSEN: Objection; form.
08:55:59 19 THE WITNESS: It would not change my opinions
08:56:00 20 concerning proper claim construction as proposed by the
08:56:05 21 two parties.
08:56:06 22 BY MR. FERRALL:
08:56:06 23 Q. Would there be portions of your declaration
08:56:10 24 that would no longer be applicable under that law?
08:56:17 25 **A. I think it would be fair to say there would be**

08:56:20 1 **portions of my declaration that would be -- would no**
08:56:25 2 **longer have any force.**
08:56:43 3 Q. So, Dr. Mack, you will agree with me that
08:56:45 4 there is nothing legally improper with interpreting a
08:56:52 5 claim such that it -- such that a single claim itself
08:57:00 6 does not cover all embodiments of the patent, correct?
08:57:03 7 MR. PEDERSEN: Objection; calls for a legal
08:57:05 8 conclusion.
08:57:07 9 THE WITNESS: I'm not sure I'm qualified to
08:57:10 10 answer about the legality of it, but my understanding is
08:57:13 11 that that's correct.
08:57:14 12 BY MR. FERRALL:
08:57:15 13 Q. Okay. And that -- I'm -- I'm not asking you
08:57:17 14 to opine on the law; I'm asking -- and maybe I should be
08:57:22 15 clear -- I'm asking whether that's a -- an understanding
08:57:24 16 of the guidelines of claim construction that you're
08:57:28 17 following in the course of providing your opinion here?
08:57:35 18 **A. Yes.**
08:58:16 19 Q. Dr. Mack, if you were faced with the choice in
08:58:27 20 construing the claim term of either following the
08:58:30 21 literal language of the claim to the exclusion of
08:58:39 22 certain embodiments or not following the literal
08:58:46 23 language and thereby including certain embodiments, what
08:58:50 24 would you do?
08:58:53 25 MR. PEDERSEN: Objection; vague. Incomplete

10:16:39 1 **function of the same range of spatial frequency.**

10:16:51 2 Q. So when you're using the word "magnitude," you

10:17:00 3 mean amplitude in the Fourier Transform; is that right?

10:17:09 4 **A. Effectively, yes.**

10:17:12 5 Q. And what word would you use to describe the

10:17:23 6 frequency terms that exist that are limited by the

10:17:29 7 band -- as I understand the band's limited nature of the

10:17:32 8 optical system -- what term do you use to describe that?

10:17:35 9 **A. I might describe the range of frequencies --**

10:17:38 10 Q. Okay.

10:17:38 11 **A. -- present in the image.**

10:17:39 12 Q. So in these -- in these two isolated images,

10:17:42 13 one of a circle and one of a square, the range of

10:17:48 14 frequencies available in the Fourier Transform of each

10:17:52 15 of these would be the same, correct?

10:17:54 16 **A. Correct.**

10:17:55 17 Q. The magnitudes may be different at different

10:17:59 18 frequencies, correct?

10:18:00 19 **A. Correct.**

10:18:41 20 Q. Let me ask you to turn to your declaration and

10:18:53 21 turn back to some legal questions for a second.

10:19:02 22 You have a couple of sections in your

10:19:06 23 declaration that talk about terms that are in the

10:19:12 24 preamble of the claim. Do you know what a preamble is?

10:19:17 25 **A. I do.**

10:30:11 1 two-dimensional optical intensity image have a larger
10:30:23 2 range of spatial frequencies than are available in the
10:30:31 3 optical intensity image?
10:30:35 4 **A. Yes.**
10:30:38 5 Q. Does the resulting pattern from the developing
10:30:41 6 step have spatial frequencies with a magnitude that are
10:30:52 7 greater than those in the optical intensity image?
10:30:57 8 **A. It may.**
10:31:01 9 Q. How would you know one way or the other?
10:31:04 10 **A. You would have to -- ultimately you would have**
10:31:09 11 **to perform the calculation of the Fourier Transform on**
10:31:13 12 **the two and compare them.**
10:31:47 13 Q. In your interpretation, your opinion regarding
10:31:51 14 the term "high spatial frequencies," you conclude in
10:31:57 15 paragraph 20 that one of its characteristics is a "final
10:32:04 16 pattern that has spatial frequencies whose magnitudes
10:32:09 17 are larger than the limit of the linear optical system
10:32:13 18 response." Do you see that?
10:32:15 19 **A. Yes.**
10:32:15 20 Q. What is meant by "magnitude" there in your
10:32:18 21 paragraph 20 of your declaration?
10:32:23 22 **A. Obviously the term "magnitude" can apply to**
10:32:26 23 **anything which can have a magnitude. So here what I**
10:32:36 24 **mean by "magnitude" is the absolute value of the spatial**
10:32:45 25 **frequency.**

10:32:51 1 Q. What -- I don't understand.
10:32:53 2 **A. Let me explain.**
10:32:55 3 **Spatial frequencies go both positive and**
10:32:57 4 **negative. Strictly speaking, all positive spatial**
10:33:03 5 **frequencies are larger than all negative spatial**
10:33:05 6 **frequencies because positive numbers are larger than**
10:33:08 7 **negative numbers.**
10:33:10 8 **But when we talk about spatial frequencies**
10:33:15 9 **being higher or lower, we generally refer to them as how**
10:33:20 10 **far away they are from 0. So minus 10 is high spatial**
10:33:26 11 **frequency just like -- well, not in the -- the way the**
10:33:30 12 **term is used in the patent necessarily, but it's a**
10:33:32 13 **higher spatial frequency than minus 5, for example. We**
10:33:36 14 **would normally describe minus 10 as a higher spatial**
10:33:40 15 **frequency than minus 5, although mathematically it's**
10:33:43 16 **actually a smaller number because it's negative.**
10:33:46 17 **So to reconcile that we say the magnitude, the**
10:33:52 18 **absolute value of the spatial frequency is larger.**
10:33:58 19 **I know that that could be confusing because we**
10:34:02 20 **also use the term "magnitude" to talk about the absolute**
10:34:05 21 **value of the amplitude. And it could be confused --**
10:34:09 22 **confusing. I can state for the record that as a**
10:34:12 23 **clarification -- and I probably should have done it**
10:34:16 24 **here -- is to say "whose absolute values are larger than**
10:34:24 25 **the lineal optical system response."**

10:52:23 1 Q. That's amplitude. Okay.
10:52:26 2 **A. And then they say the magnitude of the**
10:52:28 3 **frequency. That's the absolute value of the frequency.**
10:52:40 4 Q. Okay. So in that sentence magnitude is used
10:52:42 5 in two different ways?
10:52:44 6 **A. Well, I wouldn't -- I wouldn't say that.**
10:52:46 7 Q. Well, okay.
10:52:47 8 **A. It's -- the -- the mathematical operation of**
10:52:51 9 **magnitude is applied to two different things; one to the**
10:52:53 10 **Fourier coefficients and another to the frequency.**
10:52:57 11 **The problem comes when we use magnitude**
10:52:59 12 **without referring to what it is we're taking the**
10:53:02 13 **magnitude of, and that's where the confusion can come**
10:53:05 14 **in.**
10:53:10 15 Q. Okay. And then in paragraph 63 you say, "By
10:53:26 16 combining the patterns" -- this is second sentence of
10:53:30 17 paragraph 63 -- "By combining the patterns, the
10:53:33 18 magnitudes and phases of the spatial frequencies are
10:53:35 19 increased beyond the limit of a linear optical system."
10:53:45 20 What do you mean by "magnitudes" there?
10:53:50 21 **A. So obviously not very well worded on my part.**
10:53:52 22 **Here the magnitudes and phases of the spatial frequency**
10:53:57 23 **coefficients is the correct phrase. So these refer to**
10:54:09 24 **the amplitudes.**
10:54:21 25 Q. So in paragraph 63 you're referring to

11:01:47 1 Q. At -- okay. Let me ask it this way. If one
11:01:57 2 were to uniformly increase the magnitude of spatial
11:02:10 3 frequency terms above a certain value, can you tell me
11:02:17 4 what result you would get in the shape, in the resulting
11:02:21 5 shape of the pattern?
11:02:22 6 MR. PEDERSEN: Objection; vague. Incomplete
11:02:25 7 hypothetical.
11:02:27 8 THE WITNESS: I would have to perform the
11:02:28 9 calculation. I have not done that. I'm not -- don't
11:02:32 10 have sufficient intuition to tell me what I suspect --
11:02:36 11 what I think the answer would be.
11:02:38 12 BY MR. FERRALL:
11:03:12 13 Q. If a pattern -- if one pattern has sharper
11:03:18 14 corners than another pattern, are there necessarily
11:03:29 15 greater magnitudes of high spatial frequency terms in
11:03:33 16 the sharper pattern than in the rounder pattern?
11:03:38 17 MR. PEDERSEN: Same objection.
11:03:45 18 THE WITNESS: I -- if I'm comparing patterns
11:03:49 19 in photoresist, one has sharper corners and the other
11:03:52 20 has rounder corners the -- in general it will be the
11:03:56 21 diagonal terms which will differ. And the diagonal
11:04:02 22 terms related to the pattern with sharper corners.
11:04:08 23 There will be terms with higher amplitudes. Absolute
11:04:12 24 value of the amplitude will be greater.
11:04:18 25 BY MR. FERRALL:

12:01:32 1 **reference to its future use. If it was not to be used**
12:01:36 2 **as a mask material, then it wouldn't be referred to as a**
12:01:41 3 **mask material.**
12:01:43 4 Q. Sure.
12:01:43 5 **A. But given its intended use as a mask in some**
12:01:49 6 **later processing step, we would refer to it as mask**
12:01:52 7 **material.**
12:01:52 8 Q. Okay. And your construction of mask material
12:02:03 9 takes into account your interpretation of how that
12:02:07 10 material is going to be used per the rest of the method
12:02:11 11 of the claim, right?
12:02:14 12 **A. Yes.**
12:02:14 13 Q. So you are interpreting first mask material in
12:02:18 14 the context of the rest of the claim; is that fair?
12:02:24 15 **A. And in the context of the patent as a whole.**
12:02:27 16 Q. Sure. Will you agree with me, then, that in
12:02:31 17 the context of the rest of claim 6, the term "first mask
12:02:40 18 material" should not be the same as the photoresist
12:02:48 19 layers that are deposited?
12:02:51 20 **A. I do agree with that, yes.**
12:03:06 21 Q. Have you ever heard in the context of other --
12:03:07 22 of this or other patent cases the concept of the
12:03:12 23 antecedent to a claim term?
12:03:21 24 **A. I have heard of that, but I'm not strictly**
12:03:23 25 **familiar with it.**

12:19:49 1 in a lithographic pattern that encompasses 100 million
12:19:56 2 transistors, if the only portion you were transferring
12:19:59 3 were three transistors in the corner, that would be
12:20:05 4 sufficient so long as those three transistors satisfied
12:20:09 5 the "high spatial frequency" term?
12:20:13 6 **A. Yes.**
12:20:18 7 Q. And can you show me where in the patent
12:20:20 8 there's support for that interpretation?
12:20:28 9 **A. The interpretation for the lack of a minimum?**
12:20:33 10 Q. Yes.
12:20:36 11 **A. My lack of finding any description in the**
12:20:42 12 **patent as to there being a minimum.**
12:20:47 13 Q. Okay. Maybe I should have asked it in a
12:20:53 14 different way. Is there a -- well, let me ask you this,
12:21:46 15 Dr. Mack: If -- you will agree with me that the claim
12:22:01 16 has no prior reference to the words "first mask layer"
12:22:10 17 before that second transferring step, right?
12:22:13 18 **A. Correct.**
12:22:16 19 Q. And so if the court were to interpret first
12:22:21 20 mask layer as referring to first mask material --
12:22:26 21 because that's the closest thing that exists earlier in
12:22:28 22 the claim, will you agree that that's introduced in the
12:22:35 23 beginning of the claim as an unpatterned layer, right?
12:22:43 24 **A. Right.**
12:22:46 25 Q. And in those circumstances, Dr. Mack, will you

12:22:49 1 agree with me that once that unpatterned first mask
12:22:52 2 material has a pattern imposed into it, the result is
12:23:00 3 the same as "parts of said first mask material," right?
12:23:09 4 **A. Well, it's the same in the sense that the**
12:23:11 5 **result will have parts of the first unpatterned layer,**
12:23:17 6 **sure.**
12:23:18 7 Q. Yeah. The patterned first mask material would
12:23:23 8 be accurately described as parts of the first mask
12:23:28 9 material, right?
12:23:29 10 **A. It would be accurately described as parts of**
12:23:31 11 **the first unpatterned mask material.**
12:23:38 12 Q. Right.
12:23:38 13 **A. Sure.**
12:23:41 14 MR. FERRALL: Okay. Why don't we take a quick
12:23:44 15 lunch break. Off the record.
12:23:46 16 THE VIDEOGRAPHER: Off the record at
12:23:47 17 12:25 p.m.
12:23:51 18 (Recess taken from 12:25 p.m. to 1:15 p.m.)
13:13:37 19 THE VIDEOGRAPHER: This is the beginning of
13:13:38 20 video disk number 3 in the deposition of Chris Mack. On
13:13:40 21 the record at 1:15 p.m.
13:13:43 22 BY MR. FERRALL:
13:13:44 23 Q. Okay. Dr. Mack, let me ask you to open up
13:13:49 24 your first declaration again, Exhibit 1. And turn to
13:14:01 25 page 7, please. In paragraph 40 you indicate that there

13:14:29 1 is an embodiment perhaps at Figure 7 where "the second
13:14:39 2 photoresist is not physically present in the combined
13:14:42 3 mask when the final pattern is transferred."
13:14:44 4 Do you see that language?
13:14:45 5 **A. I do.**
13:14:46 6 Q. Can you show me where that embodiment is
13:14:48 7 described in the patent?
13:14:53 8 **A. I list it as column 13, 23 through 30, I**
13:15:02 9 **believe that is meant to say.**
13:15:08 10 Q. That's a typo in your declaration there?
13:15:11 11 **A. I believe that's the case. Let me look. Yes,**
13:15:33 12 **column 13, 23 through 30.**
13:15:40 13 Q. And can you point to the language that
13:15:43 14 indicates that "the second photoresist is not physically
13:15:48 15 present in the combined mask when the final pattern is
13:15:51 16 transferred"?
13:15:52 17 **A. Well, we could only infer that that's the**
13:15:54 18 **case, since they don't actually show that transferring**
13:16:00 19 **step occurring. But it says, "two masks provide a**
13:16:08 20 **multiplication of the individual images"; which is also**
13:16:14 21 **reflected in the equation above, equation 6, showing**
13:16:21 22 **multiplication.**
13:16:25 23 Q. I'm sorry. I didn't -- I was asking you to
13:16:27 24 tell me where in this section it explains that the
13:16:34 25 second photoresist is not physically present when the

13:16:38 1 final pattern is transferred?

13:16:40 2 **A. Well, as I said, it doesn't explain that so**

13:16:43 3 **much as it infers that. In order to multiply the two**

13:16:50 4 **patterns, as it says is going to be done, then we have**

13:16:56 5 **to transfer the second photoresist pattern into the**

13:17:03 6 **hardmask with an etch step to carry out that**

13:17:07 7 **multiplication operation.**

13:17:10 8 Q. You have to transfer the second photoresist --

13:17:15 9 **A. The second photoresist pattern --**

13:17:18 10 Q. Yeah.

13:17:20 11 **A. -- into the hardmask in order to carry out the**

13:17:23 12 **multiplication operation.**

13:17:28 13 Q. Why is that? Well, actually, let me ask you

13:17:30 14 that -- something. My real question is do you have any

13:17:43 15 indication in the patent that the process that you just

13:17:49 16 described transferring the second photoresist into the

13:17:53 17 hardmask first was done or disclosed in this patent?

13:18:07 18 **A. There are examples of that with respect to**

13:18:09 19 **Figure 9.**

13:18:13 20 Q. Okay.

13:18:21 21 **A. And the descriptions thereof.**

13:18:28 22 Q. All right. This section is talking about

13:18:30 23 Figure 7. And am I correct in understanding your

13:18:42 24 testimony that your conclusions that the second

13:18:52 25 photoresist is removed before transferring the patterns

13:18:57 1 into the substrate rely entirely upon this phrase that
13:19:04 2 says, "The two mask patterns provide a multiplication of
13:19:09 3 individual images"?
13:19:13 4 **A. No. With respect to the embodiment described**
13:19:17 5 **in Figure 7, that is true.**
13:19:21 6 Q. That's what I mean. We're -- let's stick with
13:19:23 7 the embodiment of Figure 7.
13:19:26 8 **A. So with respect to the embodiment described in**
13:19:28 9 **Figure 7, the -- the fact that the second photoresist**
13:19:41 10 **pattern is first transferred into the hardmask, then the**
13:19:49 11 **photoresist is removed, and then that combined mask**
13:19:53 12 **pattern in the hardmask is transferred into the**
13:19:56 13 **substrate, I can only infer that from the description**
13:20:00 14 **that they're providing in multiplication operation.**
13:20:04 15 **There's no explicit description of that transferring**
13:20:11 16 **step.**
13:20:13 17 Q. Will you agree with me that if you take Figure
13:20:18 18 7B of the patent and you and simply etch the combination
13:20:26 19 hardware mask and the second photoresist into the layer
13:20:30 20 below, you will achieve square holes?
13:20:36 21 **A. That's correct.**
13:20:43 22 Q. And is it your testimony that that process of
13:20:47 23 transferring is not what is covered by the second
13:20:54 24 transferring step of claim 6?
13:20:57 25 **A. No, that process would be covered.**

13:35:37 1 **become 0's.**

13:35:45 2 Q. Can I just see what you've done just to make

13:35:49 3 sure I understand.

13:35:50 4 **A. (Indicating.)**

13:35:51 5 Q. Okay. So again if we asked the question will

13:35:53 6 this region etch, yes or no, what's the result?

13:36:03 7 **A. The square or rectangular regions that I've**

13:36:07 8 **marked as 1 will be etched into the substrate.**

13:36:12 9 Q. And will anything else etch?

13:36:15 10 **A. The regions marked 0 will not be etched into**

13:36:20 11 **the substrate.**

13:36:54 12 Q. Going back to column 13, this description of

13:36:57 13 7A, 7B -- and, pardon me, can I ask for my pen back?

13:37:02 14 **A. Sure.**

13:37:02 15 Q. Thank you.

13:37:07 16 Can you explain to me what are the processing

13:37:10 17 steps one would need to follow to perform the

13:37:22 18 multiplication function as you understand it to be

13:37:26 19 described there?

13:37:34 20 **A. Well, of course, first, all the steps that are**

13:37:36 21 **explicitly described. Then they mention multiplication**

13:37:41 22 **without describing the specific steps. So those**

13:37:44 23 **specific steps would be first an etch hardware mask,**

13:37:52 24 **using the second photoresist layer as the etch mask.**

13:37:59 25 **Then a stripping of the photoresist layer away followed**

13:38:05 1 **by a transfer of that combined mask into the substrate;**
13:38:15 2 **for example, with an etch process.**
13:38:27 3 Q. So there would be one etch, a strip, and then
13:38:30 4 a second etch; is that right?
13:38:33 5 **A. Yes. And in totality, that would be the**
13:38:43 6 **transferring step.**
13:38:55 7 Q. So looking at Figure 7B, I guess I don't -- I
13:39:07 8 don't quite understand it. I believe the patent
13:39:16 9 describes the hardmask as reflected in the vertical
13:39:22 10 lines and the second photoresist in the horizontal
13:39:26 11 lines, right?
13:39:27 12 **A. That's correct.**
13:39:30 13 Q. So can you explain what happens in the first
13:39:36 14 etch step that you're contemplating?
13:39:41 15 **A. So the vertical lines are made out of silicon**
13:39:44 16 **nitride. Photoresists are these horizontal lines. You**
13:39:49 17 **would perform a silicon nitride etch step.**
13:39:53 18 **The portions of the silicon nitride that are**
13:39:55 19 **covered by the photoresist would remain; the portions of**
13:40:05 20 **the silicon nitride that are not covered by the**
13:40:07 21 **photoresist would be etched away.**
13:41:27 22 Q. When -- sorry. Let me back up.
13:41:29 23 The -- okay. So that step that you've just
13:41:31 24 described, is that etch step described in the patent
13:41:39 25 anywhere?

13:41:42 1 **A. It's described in the description of Figure 9.**

13:41:49 2 Q. Where? Show me where that is described.

13:42:42 3 **A. At the top of column 16, first line here,**
13:42:50 4 **we've already performed the first photoresist exposure**
13:42:54 5 **and development and the first transfer of the**
13:42:56 6 **photoresist into the hardmask and the stripping away of**
13:43:01 7 **the first photoresist layer.**

13:43:05 8 **With reference to Figure 9B, a new photoresist**
13:43:08 9 **layer 46 is suitably applied, and structure 40 is**
13:43:13 10 **suitably re-exposed and developed at substantially the**
13:43:14 11 **same pitch but with pattern 50 offset by p-min over 2,**
13:43:18 12 **thereby interpolating new lines 50 between -- e.g.**
13:43:23 13 **midway -- previously defined lines 48 and hardmask 44.**

13:43:32 14 **With reference to Figure 9E, any suitable**
13:43:35 15 **etching process preferably transfers line 50 into**
13:43:38 16 **hardmask material, thereby resulting in pattern 48.**
13:43:42 17 **et cetera.**

13:43:53 18 **And then it goes on to show that the**
13:43:55 19 **mathematical operation is one of multiplication.**

13:44:03 20 Q. Where does it go on to say that the operation
13:44:06 21 is multiplication?

13:44:07 22 **A. I'm sorry. Beginning at line 9,**
13:44:08 23 **"mathematically the sequence of operations is**
13:44:13 24 **represented as" and then in equation 7 it says T of x.**
13:44:21 25 **T is the final pattern. It's a function of position x.**

14:06:44 1 **being either posts or holes.**

14:06:48 2 Q. No, but in the file history they made it clear

14:06:52 3 that what they're talking about is holes, right? You

14:06:56 4 know that, right?

14:06:57 5 **A. It mentions holes to represent Figure 6.**

14:07:00 6 Q. Right. And that's the white spaces, right?

14:07:02 7 **A. It mentions that the white spaces could be**

14:07:04 8 **holes.**

14:07:04 9 Q. It doesn't mention them; it calls them holes,

14:07:07 10 right?

14:07:08 11 **A. Right.**

14:07:08 12 Q. Okay.

14:07:10 13 **A. I believe that it is left ambiguous in the**

14:07:14 14 **patent itself to cover both possibilities. And that**

14:07:22 15 **only one of those possibilities was referred to in the**

14:07:26 16 **file history.**

14:07:49 17 Q. Well -- okay. So -- yeah, in the description

14:08:21 18 of Figures 6 and 7 in the paragraph you quote on page --

14:08:29 19 on paragraph 61, it seems -- let's see -- that the word

14:08:36 20 hole is used to describe these figures one, two, three,

14:08:43 21 four times; is that right?

14:08:53 22 **A. Which report are you referring to, please?**

14:08:55 23 Q. Your reply report, paragraph 61.

14:09:02 24 Actually, I miscounted. Let's read it.

14:09:06 25 61. "Figures 6 and 7 exemplify this result by

14:17:33 1 **wafers. The second etch step preferably uses a combined**
14:17:37 2 **etch mask, parts of which are preferably comprised of**
14:17:41 3 **the nitride layer; parts of which are comprised of the**
14:17:45 4 **undeveloped photoresist layer.**
14:17:50 5 **So they're performing the embodiment where the**
14:17:57 6 **photoresist is still on the wafer and both the**
14:18:01 7 **photoresist and the hardmask layer are being used as the**
14:18:05 8 **combined mask to etch into the substrate.**
14:18:18 9 Q. And would you agree with me that that
14:18:20 10 description that you just read corresponds pretty
14:18:24 11 closely with the claim language that says "using a
14:18:29 12 combined mask, including parts of said first mask layer
14:18:34 13 and said second photoresist"?
14:18:36 14 **A. I think it's perfectly compatible with that**
14:18:38 15 **language.**
14:18:38 16 Q. Right. And then it goes on to say "in a
14:18:47 17 preferred embodiment the combined mask provides the
14:18:49 18 multiplication operation," right?
14:18:52 19 **A. It says that.**
14:18:53 20 Q. Okay. Do you agree or disagree with that
14:18:58 21 statement?
14:18:58 22 **A. I believe that statement is a mistake.**
14:19:01 23 Q. Okay. Did you note that mistake in your
14:19:07 24 report anywhere --
14:19:08 25 **A. I don't --**

14:19:08 1 Q. -- or in your declarations?

14:19:11 2 **A. I don't believe I did.**

14:19:12 3 Q. When did you first note that -- when did you

14:19:16 4 first notice that, what you believe is a mistake?

14:19:24 5 **A. I don't recall. Sometime in the preparation**

14:19:26 6 **of I believe the second declaration of mine or between**

14:19:33 7 **the first and second, I believe, is when I noticed that.**

14:19:41 8 Q. Now, if 1's and 0's are assigned to the

14:19:52 9 nitride layer and the second photoresist, as I asked you

14:19:56 10 to do in Exhibit 7, is the statement on lines 14 and 15

14:20:04 11 of column 14 still a mistake?

14:20:09 12 **A. No.**

14:20:28 13 Q. Do you interpret or for purposes of your

14:20:36 14 opinion do you interpret the line on column 14, line 10

14:20:42 15 that begins, "The second etch step preferably uses a

14:20:46 16 combined etch mask to refer to more than 1 etch step"?

14:21:02 17 **A. No.**

14:21:02 18 Q. That's a single etch step?

14:21:04 19 **A. There's no indication of it being anything**

14:21:07 20 **other than a single etch step.**

14:21:24 21 Q. The -- just looking at the claim language here

14:21:29 22 briefly. Would you agree with me, Dr. Mack, that the

14:21:42 23 combined mask term describes a physical thing?

14:21:55 24 **A. Yes.**

14:22:12 25 MR. FERRALL: Why don't we go off the record,