IN THE UNITED STATES DISTRICT COURT

IN AND FOR THE DISTRICT OF DELAWARE

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|---|---|---|
| LG ELECTRONICS U.S.A., INC., and LG ELECTRONICS, INC., | : | Civil Action |
| Plaintiffs, | : | |
| v. | : | |
| WHIRLPOOL CORPORATION, | : | |
| Defendant. | : | 08-234(GMS) |
| WHIRLPOOL CORPORATION, WHIRLPOOL PATENTS COMPANY, WHIRLPOOL MANUFACTURING CORPORATION, and MAYTAG CORPORATION, | : | |
| Counterclaim Plaintiffs, | : | |
| v. | : | |
| LG ELECTRONICS U.S.A., INC., LG ELECTRONICS, INC., and LG ELECTRONICS MONTERREY MEXICO, S.A., DE, CV, | : | |
| Counterclaim Defendants. | : | |

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Wilmington, Delaware
Wednesday, March 3, 2010
9:05 a.m.
Trial - Day Three

- - -

BEFORE: HONORABLE GREGORY M. SLEET, Chief Judge,
and a Jury

**APPEARANCES:**

**RICHARD K. HERRMANN, ESQ.**
**Morris James**
**-and-**
**PATRICK J. COYNE, ESQ.,**
**ANAND K. SHARMA, ESQ.,**
**JEFFREY W. ABRAHAM, ESQ., and**
**WALTER D. DAVIS, JR., ESQ.**
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**Richards, Layton & Finger, P.A.**
**-and-**
**SCOTT F. PARTRIDGE, ESQ.,**
**PAUL R. MORICO, ESQ.,**
**AMANDA M. WOODALL, ESQ.,**
**GENE SPEARS, ESQ.**
**Baker Botts L.L.P.**
**(Houston, TX)**

**Counsel for Defendant and Counterclaim Plaintiffs**

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**THE COURT: Good morning, counsel.**

**(Counsel respond "Good morning.")**

**THE COURT: I was greeted with a pleasant surprise today, no issues.**

**So we have the others in other rooms on the floor. Okay.**

**We miscounted. We thought we had them all. Let's relax for a moment.**

**(Recess taken.)**

**THE COURT: Everyone is here.**

**(Jury enters courtroom at 9:04 a.m.)**

**THE COURT: Good morning, ladies and gentlemen. Welcome. Please take your seats.**

**Okay. Mr. Partridge.**

**MR. PARTRIDGE: Yes, Your Honor. If I may, I would like to make a short explanatory statement of the day's activities or at least what I would anticipate.**

**The first witness that we will call this morning is Mr. Tom Schwyn, who is a vice president and associate general counsel. He will talk about the patent process and patent management at Whirlpool.**

**The second witness will be Mr. Verne Myers, who is a physicist at Whirlpool and one of the inventors on the '130 patent. So he will talk about the developments that led to the '130 patent.**

**The third witness will be Mr. Steve Williams, who is an electrical engineer at Whirlpool and is one of the inventors on the '601, or plaques patent.**

**From that we will have set the stage for Dr. Robert Caligiuri, who is one of our technical experts, who will then talk about infringement of the '130 and the '601 patents.**

**And presenting our first witness this morning will be Mr. Gene Spears, and I will allow him to introduce himself as we begin the proceedings.**

**Thank you, Your Honor.**

**THE COURT: All right, Mr. Partridge.**

**Mr. Spears.**

**MR. SPEARS: Good morning. My name is Gene Spears. I work with Mr. Partridge. As Mr. Partridge indicated, our next witness this morning is Mr. Tom Schwyn.**

**... Thomas A. Schwyn, having been duly sworn as a witness, was examined and testified as follows ...**

**MR. SPEARS: We will wait a couple seconds, while the jury notebooks are handed out.**

**THE COURT: You may inquire, Mr. Spears.**

**DIRECT EXAMINATION**

**BY MR. SPEARS:**

Q. **Where do you live, Mr. Schwyn?**

A. **Currently I am a resident of St. Joseph's, Michigan,**

**where I live with my wife and my high-school-age son and middle-school daughter.**

Q. **What is your current position with Whirlpool?**

A. **Currently I am vice president and associate general counsel of global operations within the Whirlpool law department.**

Q. **How long have you worked for the company?**

A. **I have been at Whirlpool 24 years now. Ever since I was in college, actually.**

Q. **I am just guessing that 24 years ago you didn't hire into Whirlpool as a vice president.**

A. **Actually, no. I came to Whirlpool initially as a college intern student when I was getting my engineering degree at the University of Cincinnati. My co-op or intern job was with Whirlpool, so I worked every other semester at college at Whirlpool.**

Q. **What did you do at the company after that?**

A. **After I graduated with an engineering degree, I joined Whirlpool as an electrical engineer in the dishwasher laboratory in St. Joseph's, Michigan, where I tested electronic controls for dishwashers that we made.**

Q. **How did those tests come out?**

A. **Generally they came out pretty good.**

Q. **What did you do after you left the dishwasher lab?**

A. **Shortly after I left the dishwasher lab I found a job**

**in the Whirlpool law department as what we call a patent engineer, where I assisted Whirlpool's patent attorneys, basically helping our engineers obtain patents and do patent research on things that we wanted to protect and things that others had patented already.**

Q. **And was that work interesting to you?**

A. **I did find it interesting. As I enjoyed the variety, I was able to use my engineer background but in some different ways.**

Q. **Did you go to law school at some point after that?**

A. **Yes. Actually, while I was in the law department, we have a rotation or training program that I was lucky enough to get into where I moved out to Washington, D.C., and worked for Whirlpool Corporation doing patent searches and various patent legal work during the day. And I attended law school in the evening at George Washington University in Washington, D.C., where I earned my law degree in 1994.**

Q. **After you earned your law degree in 1994, what did you do next?**

A. **I moved back to our headquarters, which are in Benton Harbor, Michigan, and I was a patent lawyer, handling different product categories, dishwashers, washing machines, cooking products for a while.**

Q. **Did you have an opportunity to take an assignment for the company outside the state of Michigan?**

A. **Yes. In 1998 I was given an opportunity to move over to Italy for a year with my family. And I worked in our European headquarters, which are in Italy, northern Italy. And I did some general legal work at that time. Sales support and various other legal work.**

Q. **When did you move back to Michigan?**

A. **I think it was around 1999, I came back to Whirlpool's law department in Benton Harbor as a lawyer. I was doing some commercial legal work at that time, sales and marketing, antitrust law. I did that for about six or seven years.**

Q. **What was your next position?**

A. **After that I had an interest in getting back into the patent field. So I took a position as Whirlpool's chief patent counsel in early 2007, where I led the team of lawyers and legal assistants that basically did all the patent work for Whirlpool. That was in a division of Whirlpool called Whirlpool Patents Company.**

Q. **When did you take your current position as vice president and associate general counsel?**

A. **My current position was effective just January of this year. So that is a very new position for me.**

Q. **What are your current responsibilities for the company?**

A. **Again, my title is vice president and associate**

**general counsel for global operations. Basically, I lead the groups of lawyers and legal professionals who provide legal support for a lot of our global product operations. That includes things like the engineering function, the technology function, a department we call procurement, which basically helps identify suppliers that can supply components that go into our products, as well as our global information systems group.**

**So it includes a lot of product and technical things that are more global than they are regional.**

Q. **What responsibilities, if any, do you have for formulating and implementing Whirlpool's patenting strategies?**

A. **Well, myself and the lawyers who work in the patent group at Whirlpool, we consider ourselves partners with our business clients, which are primarily -- our most direct clients are in the technology function. But we basically work together to have the correct business strategy and legal actions to acquire patents on technology that Whirlpool wants to protect, to do agreements that involve technology and intellectual property.**

Q. **The jury has been provided with preliminary instructions. I believe on the second page after the cover page there is a list of various Whirlpool companies. What I would like to do is briefly talk through what these**

**companies are and how they relate to each other.**

**The first one I would like you to talk about is the Whirlpool Corporation.**

A. **Sure. Whirlpool Corporation, Tom Catania mentioned Whirlpool and its long history yesterday, but basically that's the parent company of the Whirlpool family of companies. Like many large companies, Whirlpool is organized into a number of different separate legal entities, and Whirlpool is the ultimate parent of all of those entities.**

Q. **What is the Whirlpool Patent Company?**

A. **The Whirlpool Patent Company is a Michigan corporation that is a separate company. It's wholly owned by Whirlpool Corporation. It's a subsidiary. And it basically employs the lawyers and legal professionals that do our North America-based patent activity. It also happens to be the company where we have placed our patent assets. Our North America-owned patent assets are owned by Whirlpool Patent Company.**

Q. **Do those assets include the two Whirlpool patents that are being asserted in this lawsuit?**

A. **Yes, it does.**

Q. **Do you have a position with the Whirlpool Patent Company?**

A. **Yes. My title with that entity is president of**

**Whirlpool Patent Company.**

Q. **What about Whirlpool Manufacturing Corporation, what's that?**

A. **It's a company that was formed in 2000. It is actually a subsidiary of Whirlpool Patent Company, so it's wholly owned by Whirlpool Patent Company. It is somewhat inactive. It was initially intended to have some manufacturing assets that for business reasons Whirlpool elected not to put in that company. It's basically a company that is owned by Whirlpool Patent Company.**

Q. **Finally, can you tell us what the Maytag Corporation is?**

A. **Sure. Again, Tom Catania mentioned this a little bit yesterday, but Maytag for many years was an independent appliance company. In 2006 Whirlpool Corporation acquired Maytag. Now, in addition to being an important brand, it is actually a separate legal entity. It is just another wholly-owned subsidiary of Whirlpool Corporation.**

Q. **Now, Mr. Schwyn, with respect to patenting, what are Whirlpool's general objectives?**

A. **Our general objectives are to acquire intellectual property that protects the important consumer innovations that we want to bring to market. Again, I will remind you of a couple of the slides that Tom Catania showed you yesterday. He showed the history of Whirlpool and how from**

**the beginning patents were important to us on the wringer washer, that continues up to today.**

**We call them our business clients, the people in marketing and sales at Whirlpool who are responsible for formulating some of those consumer-oriented strategies where we try to identify what solutions a consumer wants. If you happen to be a Gladiator consumer, what sort of refrigerator might that person want. So our brand people help formulate what the consumer need is. Then the technology and engineering people attempt to design and create product solutions that will meet that need.**

**Our job on the legal side of that is to help acquire patents that protect those technical solutions.**

**So the patent strategy at Whirlpool is very much an integral part of this whole business strategy of trying to develop and bring to market solutions that consumers want.**

Q. **How does the patent process in Whirlpool get started?**

A. **It typically starts with an engineer or inventor, anyone in the company, actually, submitting an invention disclosure sheet, which is basically a form that a person fills out to say, I have an idea, I created a thing, I described it in paper, I signed my name, I get some witnesses, and I record a date on it. They submit that to the legal department.**

Q. **Does Whirlpool encourage its inventors to do that?**

A. **We do. We have business processes that require our inventors, actually, to submit those when they have. We want to know about them, for many reasons. Obviously, we want to encourage our people to that innovate. But there are also legal reasons why. We want them to tell us about their ideas and create a legal record of those when they exist.**

Q. **What does the Whirlpool patent department do when it receives an invention disclosure sheet from a Whirlpool engineer?**

A. **We certainly keep a copy of it. An important thing we do, again, I mentioned that we are partners with the technology personnel, so we will have what we will call a patent committee meeting and we will sit down with our business clients and we will look at the pile of invention disclosure sheets that came in. We will try to identify the ones that hit some of those key consumer innovation targets that we want to protect. A lot of times those will stem from active projects that Whirlpool has. But for the ones that look most promising, we will usually initiate some legal activity to prepare a patent application.**

**Some of them we may conclude that the project that they relate to is still under development and we need to wait a while for the development to be completed before**

**we prepare a patent application. Then some might say that is a good idea, but there is no interest at the time, so we may not act on those.**

Q. **In a typical year about how many of these invention disclosures does the Whirlpool patent department receive from its engineers?**

A. **It varies a little bit from year to year. I think we are running about a thousand a year, again speaking from our North America-based operations. We get additional invention disclosures outside the U.S.**

Q. **About how many of those pass the patent department's smell test and get filed as applications before the Patent Office?**

A. **In the most current year we filed 243 new original U.S. patent applications. So roughly one in four, one in five ideas turn into a new patent application.**

Q. **Why doesn't Whirlpool file patent applications on every idea it receives from its engineers?**

A. **Like I said, we are very deliberate in our business strategy. We have a lot of employees. Our employees have many great ideas. It is a great problem to have, but we have more ideas than we can act on is a way to think about it. For efficiency and to manage our resources, we choose to act on -- obtain patents on those inventions that are most central to our business plans, those things that appear**

**strategic in terms of consumer-focused innovation.**

Q. **Were you in the courtroom on Monday?**

A. **Yes, I was.**

Q. **Did you see the video that was played with the guideline explaining how the patent process works?**

A. **Yes, I did.**

Q. **Do you remember the shot with the handshake, symbolizing the deal between patent applicants and the United States government, the public?**

A. **Yes.**

Q. **How does Whirlpool go about living up to its end of that deal?**

A. **Again, we are deliberate with our patent activities. By "deliberate," I mean a couple of things. When we receive invention disclosure sheets, oftentimes the first step we will take, in terms of a legal action, is what we call a patent search. What we want to find out is has somebody else done something similar in the past, how different is our invention from what has been done before. So we really like to be sure that we have quality and novelty in those inventions that we pursue.**

**When we do pursue them, we attempt to make sure that our inventions are fully developed, and we attempt to claim as much subject matter and disclose as much as we can in our patent applications. We tend to file -- we attempt**

**to file broad patent applications that cover as much intellectual property bases as we can get for any given patent.**

Q. **Does Whirlpool try to get those patent applications on file as soon as it receives these IDSs from its inventors?**

A. **Not necessarily. As you can imagine, a big company like Whirlpool, we have ideas that pop up at a lot of different stages of a certain project development.**

**So you may have a situation where a product is about to go to market, it's completely invented. If you get an invention disclosure sheet, it makes sense to act very quickly on that one, and you file the patent right away.**

**However, a lot of times the inventions you get or the idea submissions are at that kind of fuzzy front end of a project. A person has a good idea, basic concept, but they haven't really completed the concept yet. U.S. law allows us to allow that inventor to complete their development activity. And we encourage them to do that. So when we prepare our application for patent, we describe the invention fully.**

**Again, that's our effort to meet that handshake with the government. Our job is to disclose the full invention that we have in order for us to get that deal back from the government when they award us a patent.**

Q. **While you are working to prepare these patent**

**applications, aren't you worried that a competitor might beat you to the U.S. Patent Office with its own patent application?**

A. **Well, a fairly unique thing about U.S. patents -- by the way, the patent system differs from country to country. But the U.S. system awards -- it's called a first to invent system. So a patent is awarded to the first party who actually invented something, not the first one who files a patent application at the Patent Office necessarily.**

**As long as we recorded our invention activities and can prove our invention date, we do have some protection against somebody who invents later.**

Q. **So we talked some, Mr. Schwyn, about Whirlpool's general approach to patenting. Are there different strategies that other companies use?**

A. **Well, again, I mentioned, the U.S. is a first to invent country, in terms of its patent law. Most other countries around the world are what we call the first to file system, which is a different approach. The law there typically would award a patent in that country to the first person to make it to the Patent Office with a patent application.**

**So if you think about it, the mindset that that creates, if you are a person sitting in one of those first-to-file countries, as soon as you have an invention,**

**you would fear that somebody else might come up with a similar idea and beat you to the Patent Office. So it really forces you to move very quickly, file a patent application, and in some cases it may force you to file a series of -- you can think about it as smaller applications on fragments of your invention rather than try to develop the whole thing out.**

Q. **Mr. Schwyn, on Monday, after you saw the video played, did you stick around for opening statements?**

A. **Yes, I did.**

Q. **Did you hear Mr. Coyne suggest in his opening statement that there may be some inconsistency between the arguments that Whirlpool will be making with respect to the validity of LG's '121 patent and positions that Whirlpool has taken before the United States Patent and Trademark Office?**

A. **I did hear him say that.**

Q. **I would like to ask you some questions about that.**

**To begin I would like for you to turn to tab 8 in the binder that has been placed in front of you, where we placed a copy of Plaintiffs' Trial Exhibit 742.**

A. **Did you say tab 8?**

Q. **Yes, that's correct.**

**Can you identify that exhibit?**

A. **It's a U.S. patent that's currently owned by Whirlpool**

**Patent Company.**

Q. **Can you read the title of that patent?**

A. **"Water Dispenser For Refrigerator Freezers."**

Q. **To your knowledge, has Whirlpool filed any other patent applications related to the invention of this patent?**

A. **Yes. We have filed what's called a continuation application that -- you can think of that as a branch off of the original application that turned into this particular patent. It's based on the same disclosure, but it has different claims in it.**

Q. **What is the current status of that continuation application in the U.S. Patent and Trademark Office?**

A. **It's currently pending before the U.S. Patent Office, and it's the subject of what we call an interference proceeding, which involves our pending application and LG's '121 patent.**

Q. **What do you understand to be the purpose of that interference proceeding?**

A. **Like I mentioned before, the U.S. is a first-to-invent country for patent law. And so an interference in general is an investigation or a contest that the Patent Office will manage to figure out who actually invented a certain thing first. And that's basically the status that our application is in, versus the '121 patent, it's a process to decide between LG and Whirlpool which of us invented that first.**

Q. **Could you turn with me to tab 1 in the black binder in front of you where we placed a copy of Plaintiffs' Trial Exhibit 1? Can you identify this exhibit?**

A. **My tab 1 shows another U.S. patent owned by Whirlpool Patent Company. It's the '601 patent.**

Q. **I'm sorry, I meant to take you to tab 6. Sorry about that.**

A. **Okay. My tab 6 is the LG '121 patent.**

Q. **Is that the patent that LG is asserting in this lawsuit?**

A. **Yes, it is.**

Q. **What claims do you understand in that patent LG is asserting against Whirlpool?**

A. **20, 21, and 36.**

Q. **In the interference proceeding that you discussed, has the Patent and Trademark Office made any determinations about claims 20, 21, and 36 of the '121 patent?**

A. **One of the actions that the Patent and Trademark Office has taken is they have initiated what they call a count of the claims of Whirlpool's pending application versus those claims of the '121 patent. By including those in the count, they basically said that the subject matter of those '121 claims isn't substantially different from Whirlpool's pending application. So they have lumped them together in the same count.**

Q. **And how does that determination of the Patent and Trademark Office about this count and claims 20, 21, and 36 compare to the position that Whirlpool is taking in this lawsuit about the validity of those three claims of that patent?**

A. **It's consistent. The position Whirlpool is taking, and our witnesses will explain this in a lot more detail than I can, is that Whirlpool invented the subject matter of our pending application that includes a slide-out tray and a pivot-out dispenser. We feel we are entitled to a patent on that, which is pending before the U.S. Patent Office.**

**We have also taken the position that the subject matter of LG's claims 20, 21, and 36 isn't substantially different from what we already invented; therefore, LG is not entitled to patentable subject matter on that difference that they describe in their claims.**

**THE COURT: Can I see counsel for a minute?**

**(The following took place at sidebar:)**

**THE COURT: In your questioning you need to be real careful to make clear that this is the position that he has taken.**

**MR. SPEARS: I am done with my exam.**

**MR. COYNE: Your Honor, we have some very serious concerns now.**

**THE COURT: You didn't verbalize them at all**

**until I just asked for a sidebar, counsel. I am not LG's counsel. I am simply trying to keep the playing field level so that the jury doesn't get confused. That is the only reason I am interfering.**

**MR. SPEARS: I understand.**

**THE COURT: I am not taking sides one way or the other, but I am going to call it down the middle. I can't do the lawyering, Mr. Coyne, and Mr. Spears. You are great lawyers. Please, let's make it easier for this jury. We don't need to make it any more complicated than it is going to be.**

**MR. HERRMANN: But, Your Honor, Whirlpool went into the decision on the interference, and we think that that opens the door to raise decisions from other agencies.**

**MR. SPEARS: The only reason I did this is because of what Mr. Coyne said in his opening statement. He accused us of an inconsistency. This is the only witness that I can chase that skunk out of the jury box with.**

**THE COURT: You mean inconsistent positions?**

**MR. SPEARS: Yes. If Mr. Coyne had not said that in his opening statement, none of this testimony would have come in.**

**MR. COYNE: Your Honor, I was very, very careful during my opening to speak only of their positions. I assiduously avoided saying anything about the order.**

**THE COURT: The witness has said his position.**

**MR. COYNE: He has also now mentioned the count order, the order --**

**THE COURT: That is why I interrupted because I am concerned for the reasons that Mr. Herrmann has just articulated. So at this point I am not going to determine that the door has been opened. But I am going to caution counsel to be very careful.**

**MR. SPEARS: I am done. This is as far as the witness is going to go.**

**THE COURT: What I would suggest is perhaps an instruction that you might want to agree upon, so as to make this issue clear, that this gentleman is not offering an opinion.**

**MR. SPEARS: Absolutely.**

**THE COURT: It may be we should just let it go. You will make your arguments in your closings and we will leave it to that.**

**MR. SPEARS: Fair enough.**

**(End of sidebar conference.)**

**CROSS-EXAMINATION**

**BY MR. COYNE:**

Q. **Good morning, Mr. Schwyn.**

A. **Good morning.**

Q. **I want to ask you a few questions about the corporate**

**structure that you mentioned. Could we put up PDX-24, please?**

**Does this accurately reflect the corporate structure that you described between Whirlpool, Whirlpool patents, Whirlpool Manufacturing, and Maytag?**

A. **Yes. It describes the portion that I described. I wanted to clarify, there are a lot of other subsidiaries at Whirlpool that I didn't describe obviously.**

Q. **But these are the entities that are important for this case, right?**

A. **Yes.**

Q. **Can we bring up PDX-25, please? Can we scroll through?**

**In terms of the relationship between the companies, is what's being shown now on the board a fair characterization of how the patent rights flow between these four entities?**

A. **It's a decent summary. It's a very high-level summary. But, yes, at that level it's okay.**

Q. **It is accurate?**

A. **Yes.**

Q. **Let me put one thing up, to make sure we are not talking at cross-purposes with each other.**

**I am showing you what was marked at your deposition in this case as Exhibit 5. This was a**

**handwritten graph that you made during the deposition. I have tried to capture it accurately, although the arrow goes one direction on one and one direction on the other.**

**Does that help refresh your recollection at all with respect to the prior graphic?**

A. **Yes. The prior graphic was fine. This is not my chart. It may be a chart of somebody else.**

Q. **Thank you, sir.**

**If we can go back to 25. The rights that flow, so the patents are granted to Whirlpool and they are assigned -- the ownership is assigned to Whirlpool Patents. Is that right?**

A. **That's correct.**

Q. **Then Whirlpool Patents enters into license agreements with Whirlpool Manufacturing, right?**

A. **Right.**

Q. **And is that an exclusive or nonexclusive license?**

A. **I would have to look at the contract to refresh my memory on that.**

Q. **You don't know?**

A. **I don't know.**

Q. **How about the license agreement between Whirlpool Manufacturing Company and Whirlpool Corp., is that exclusive or nonexclusive?**

A. **I don't recall as I sit here today.**

Q. **Let's go back to some of the points that you raised. Does Whirlpool Corp. have the exclusive right to sue on the patents that are licensed back to it?**

A. **I don't recall.**

Q. **Who does have the right to sue under the '601 and '130 patents?**

A. **Who has the right to sue? Certainly Whirlpool Patent Company would have the right as an owner.**

Q. **Does Whirlpool Manufacturing have the right to sue under those patents?**

A. **I would need to look at the license agreement.**

Q. **With respect to the other two entities, you just don't recall?**

A. **I don't recall as I sit here.**

Q. **That license that is between the companies, that is a royalty-bearing license?**

A. **Yes.**

Q. **Let me go back to a couple of things. You mentioned the patent department's activities.**

**You run your patent group. Are you looking out for patents by other companies in the industry that you compete with?**

A. **Generally, yes.**

Q. **Do you monitor those regularly?**

A. **Again, I mentioned one of the activities that we will**

**do is patent searching. So when we have a product that we are going to bring to market, we have a process called IP clearance, where we will do research on what other IP is out there that we need to avoid, is there any white space where we can acquire our own IP.**

Q. **Do you do any searching at any time with respect to looking proactively at other competitors in the field and see what patents they are getting issued?**

A. **We do on occasion. We do what we call landscape studies once in a while, a particular technology field.**

Q. **Have you ever done that in refrigeration?**

A. **Yes.**

Q. **How often?**

A. **There is not a regular schedule. I guess they happen sporadically. I would say a couple times a year.**

Q. **Just a couple times a year?**

A. **That's right.**

Q. **Have you ever done them where you have been looking for patents by LG?**

A. **I am sure we must have.**

Q. **Do you ever pick up patent applications in that landscaping search?**

A. **Yes, to the extent they are published.**

Q. **I am sorry?**

A. **To the extent they are published applications, we may**

**see them. Not all patent applications are published, so some of them remain invisible.**

Q. **What do you mean by "white space," where you can get your own IP?**

A. **Spaces where, you know, people haven't done a lot of prior invention.**

Q. **Do you do that in the refrigeration space, try to identify white space?**

A. **We may on occasion.**

Q. **Have you ever come across any LG patents during this landscaping exercise or when you are searching for particular inventions?**

A. **Yes, we will find patents of LG and other parties in the industry, sure.**

Q. **One of the patents that you found over the years doing that is the '121 patent, right?**

A. **The '121 patent issued January 8th, 2008, as I understand it, although we were sued in April on that.**

Q. **Well, it was filed -- the original Korean document was filed on September 17, 2003.**

**Let me back up for a second.**

**You have been in the courtroom since the beginning of the trial, right?**

A. **Yes.**

Q. **And you have heard the testimony of the other**

witnesses, correct?
A. Yes.
Q. And a couple times we have had on the board the Korean priority application for the '121 patent. And you saw that September 17, 2003, date, right?
A. Can you refresh my memory on which witness had that up? I was out of the courtroom for part of yesterday.
Q. I had it up for my opening. You were there for that, right?
A. Yes. I was there, yes.
Q. And you were here for Dr. Lee's testimony?
A. Yes, I was.
Q. Can we agree that the foreign application for the '121 was filed on September 17, 2003?
A. I will take your word for it.
Q. And under U.S. law, if a U.S. application is also filed, which we also saw during the last couple of days, that would be published, it would be made available to the public to inspect it 18 months after that filing date. Right?
A. In general, yes.
Q. And that patent application was then published on March 17, 2005, right?
A. I have no idea. I will have to take your word for that.

Q. **Did you pick that patent application up at one of the two landscaping studies you did in 2005?**

A. **Not to my knowledge.**

Q. **Did you pick it up in any of the landscaping studies you did in 2006?**

A. **Not that I am aware of.**

Q. **When did you first become aware of the '121 patent?**

A. **I believe it was on the date we got sued by LG.**

Q. **No prior information about the '121 patent in the company at all?**

A. **Not to my knowledge.**

Q. **Who would know?**

A. **Well, we could probably ask people within the law department, within the engineering community, people who receive patent information.**

Q. **You mentioned that you file about 243 new original patent applications per year. Is that for the whole company or just in refrigeration?**

A. **That's for our U.S. operations. It doesn't include our overseas patents.**

Q. **That's all technologies?**

A. **Yes.**

Q. **How many of those are refrigeration?**

A. **I don't have an exact number. It would be a significant chunk of those. Refrigeration and washers tend**

**to be our leading categories for patents.**

Q. **Can you give me a rough proportion of how many of those 243 patent applications would relate to refrigeration?**

A. **Perhaps 30 percent of them.**

Q. **So about 60-70, is that a fair rough estimate?**

A. **Sure.**

Q. **You were asked about the proceedings at the Patent Office with respect to this tab 8, PTX-742.**

**Can we get that 742 document up, Mr. Brooks?**

**Let me ask you first about what formal processes do you have in place in your law department to ensure that the company is not taking a position in litigation that's inconsistent with the position that it has taken at the U.S. Patent and Trademark Office in order to get a patent?**

A. **What formal processes? Can you be more specific on that?**

Q. **Do you have any clearing, screening procedure where someone has to review what's being said in the litigation relative to what was said in the Patent Office to get the patent in the first place?**

A. **It's a fairly simple process in that we are a fairly small patent operation. And we, frankly, don't have very much patent litigation to begin with, nor do we have many interferences pending. So it tends to -- those sort of activities tend to flow through a very small group of people**

**on the legal side.**

Q. **You are one of them?**

A. **I am one of them for some of those matters. Obviously, I am not involved in the prosecution of every single patent application that we have.**

Q. **Suffice it to say there is no formal process?**

A. **I wouldn't say there is the absence of a process, either. We hire employee-skilled patent lawyers to do this kind of work. Obviously, they manage their work by product category. So if there is a patent application pending in refrigeration, and if there is some sort of patent enforcement activity underway in refrigeration, it's very likely that the lawyer working in that category is going to have knowledge of both matters and be overseeing it.**

Q. **Who is responsible for making sure that Whirlpool is not taking an inconsistent position with respect to this interference and this litigation with respect to the '121 patent?**

A. **Well, ultimately me.**

Q. **How about with respect to the '601 patent?**

A. **The '601 patent is an issued patent; therefore, the lawyers prosecuting that patent at the time would monitor any activities underway, take the right approach.**

Q. **At this point I understand the patent sticks, the handshake is done. Right?**

A. **Correct.**

Q. **So the bargain has been struck and the deal has been cut.**

**I am talking about how do you ensure you are not taking positions inconsistent in this case with the deal that was struck?**

A. **There is nothing about the positions we are taking that is inconsistent. I am not sure what you are asking me.**

Q. **Let me be more specific, then.**

**One of the positions that Whirlpool is taking in the interference is that that patent should be taken away from LG and given to Whirlpool. Correct?**

A. **I think you are glossing over a lot of important details when you say that.**

**The position that Whirlpool is taking in the interference, which is identical to the position Whirlpool is taking here, is that we invented that subject matter first, the pivot-out spigot and the sliding tray. We have a patent application pending. We feel that we are entitled to the patent claims on that.**

**LG has asserted claims 20, 21, and 36, which cover a very narrow difference, this mechanical drive concept. We don't feel that is significantly different from what we have already invented; therefore, our position is that LG is not entitled to those claims, those claims are**

**invalid.**

**Those are different claims than the '121 patent. We have our own patent pending on our subject matter that we claim we invented it first, it is patentable, and we are entitled to those patent claims.**

Q. **Let me break up the question in a little more smaller pieces. One of the positions Whirlpool is taking is that Whirlpool believes that patent should be taken away from LG. Correct?**

A. **Whirlpool's position is that Whirlpool invented the subject matter first; therefore, our application has priority over LG's and that our patent should be awarded to us.**

Q. **And the '121 patent should be awarded to you, too. That's your position, right?**

A. **That's not our position. We are taking the position that our patent application has priority. Certain claims of LG's are not patentably distinct from our own invention; therefore, LG is not entitled to those claims.**

Q. **The relief you are asking for in the interference --**

**THE COURT: He has answered it three times, Mr. Coyne.**

**MR. COYNE: I don't feel I am getting an answer. I am sorry, Your Honor.**

**THE COURT: Don't make editorial comments like**

that. The witness has answered the question to my satisfaction.

MR. COYNE: Thank you, Your Honor. I will move on.

BY MR. COYNE:

Q. You said "entitled to the patent claims." The claims that Whirlpool feels it's entitled to, it feels those claims are valid, correct?

A. Certainly.

Q. It has taken the position in this case that those claims are invalid, right?

A. Can you repeat your question?

Q. Whirlpool is taking the position in its case that claims 20, 21, and 36 that Whirlpool feels it's entitled to in the Patent Office are invalid in this court. Correct?

A. You are asking me to explain the same thing I have just explained three times. We invented the combination of a pull-out tray and a pivot-out dispenser. We have an application pending on that. We have taken a position in the Patent Office and in this litigation that LG's contribution is a mechanical drive that was discussed as a spring. We don't feel that is distinct from what we already invented, and we are taking the position with the Patent Office and with this Court that LG's claims are invalid. Claims 20, 21, and 36, those are different claims from the

**claims in our patent application, which is pending before the Patent Office. Okay?**

Q. **And the position you are taking, Whirlpool is taking in this Court is that those claims are invalid based on prior art, correct?**

A. **They are invalid, among other things, based on prior art. But in view of Whirlpool's contribution to the basic invention of the slide-out tray and the pivot-out dispenser.**

**MR. COYNE: Thank you, sir.**

**No further questions, Your Honor.**

**THE COURT: Redirect, Mr. Spears?**

**MR. SPEARS: No further questions, Your Honor.**

**THE COURT: Thank you. You are excused.**

**(Witness excused.)**

**THE COURT: Mr. Partridge.**

**MR. PARTRIDGE: As our next witness we call Mr. Verne Myers.**

**... Verne Henry Myers, having been duly sworn as a witness, was examined and testified as follows ...**

**DIRECT EXAMINATION**

**BY MR. PARTRIDGE:**

Q. **Good morning, Mr. Myers. Thank you for coming in this morning to tell the jury about your invention.**

**Would you start by telling us a little bit about yourself, please?**

A. **Sure.**

Q. **Hang on just a moment, I am sorry. Let's give the jury a chance to receive these photos. My apologies.**

**Would you tell us a little bit about yourself?**

A. **Sure. I grew up in Fort Wayne, Indiana. I am married almost 29 years now; have three children. My oldest is going to Michigan State University. My oldest son. My middle daughter is going to Indiana University. And my youngest child, my youngest boy, 13 years old, is in middle school right now.**

Q. **Great. Thank you. If you can just relax a little, that would be fine.**

A. **Sure.**

Q. **Would you tell us who your current employer is, please?**

A. **My current employer is Whirlpool Corporation.**

Q. **And your current title?**

A. **Technology director, portables and air treatments.**

Q. **Would you tell us briefly what that entails?**

A. **Sure. As technology director, I am accountable for new technologies and innovations and developing those new technologies and innovations for countertop appliances like the Kitchen Aid stand mixer, Kitchen Aid food processor, and also for air conditioning products, like window air conditioners, dehumidifiers, and air purifiers.**

Q. **Now, one of the things I have noticed when you and I have chatted over the past number of days is that I am a slow speaker and you are a fast speaker. I would just ask you to try to slow down a little bit so that people can follow what it is you are saying. I know that's tough, but I would ask that you do that.**

A. **I will try to do so.**

Q. **So you have worked at Whirlpool how long at this point?**

A. **I have worked at Whirlpool for 17 years now.**

Q. **And during that period of time, has your work from time to time focused on refrigerators?**

A. **Yes, it has. I was hired in in advanced development refrigeration, from 1993 to 1998. And I again worked in refrigeration from 2006 through 2008.**

Q. **So roughly eight years or so? Would that be about right?**

A. **That would be about right.**

Q. **During the 1993-through-'98 time period, that first of the two time periods, what were you doing on refrigerators? What was your role in general, very briefly?**

A. **I hired in as a lead engineer, as I mentioned, in advanced development, focused on new testing, focused on designing new lighting systems, heat exchangers, air flow systems, new testing and simulation techniques, as well as**

**new ice and water systems.**

**I moved on into a global product role in refrigeration where I led the first collection, global collection of innovations that were collected into a single list.**

**And I also led an effort to analyze all of our platforms globally to determine which ones should we obsolete and which ones should we retain for optimal product line and manufacturing.**

Q. **Now, that was a lot, so I would like to try to narrow this down a little bit, if I can.**

**During that period of time, were you ever a project lead?**

A. **Yes, I was.**

Q. **And what were you the project lead for?**

A. **I was the project lead for our next-generation ice and water systems initiative.**

Q. **What was that?**

A. **That was all about studying the fundamental consumer needs around freezer designs and our ice and water systems.**

**So fundamental evaluation of consumer needs, brainstorming of potential solutions that met those consumer needs, testing of those solutions with consumers as to which ones of those were best -- they responded best to, and then developing those particular solutions.**

Q. **You described a number of aspects of this new-generation system. I take it those occurred over some period of time. Is that right?**

A. **Yes, they did.**

Q. **Roughly over what period of time were you the project lead for those types of activities?**

A. **From 1994 through about 19 -- end of 1997, if I recall correctly.**

Q. **Did that work that you described lead to a patent?**

A. **Yes, it did.**

Q. **Did it lead to one of the patents at issue in this lawsuit; namely, the '130 patent?**

A. **Yes. It led to the in-door-ice patent.**

Q. **Can we put up Defendants Exhibit 8, please? First page.**

A. **Should I refer to anything in the book?**

Q. **We will just do it off of this. We may get to the book.**

A. **All right.**

Q. **Is this the patent that you were describing?**

A. **Yes, it is.**

Q. **It is on your screen in front of you. This is the '130 patent. I have highlighted your name. I gather that is, in fact, you?**

A. **That is, in fact, me, yes.**

Q. **And you are one of I guess eight inventors on this; is that correct?**

A. **Yes.**

Q. **This is a patent that you filed on December 28, 1998, correct?**

A. **That's correct.**

Q. **And it then issued on July 4th, 2000?**

A. **Yes, that's correct.**

Q. **I don't want to go into the details of the patent just yet, but what is it that you refer to the subject matter of the '130 patent as covering?**

A. **Well, I think at a very general level, for me, it's covering the idea of an ice maker that's been placed in a position above an ice storage bin that's located on the door of a refrigerator freezer that ice is dispensed -- is dropped into this ice bin, is then -- also contains an auger and a motor that drives that auger so that ice can then be dispensed out of this bin, door-mounted bin through the door of the refrigerator freezer to the consumer on the outside.**

Q. **And you were here for the opening statements, correct?**

A. **Yes, I was.**

Q. **I used the term, and I believe Mr. Coyne may have used it, too, I am not entirely sure, IDI. Did you hear that? Are you familiar with that term, "IDI"?**

A. **Yes, I am.**

Q. **Does that describe this technology? Is that an acronym that you use for that?**

A. **Yes, it would be.**

Q. **It stands for in-door-ice?**

A. **In-door-ice.**

Q. **I now want to move away from the patent and go back to the other time period while working at Whirlpool in which you were involved with refrigerators. I think you said that was the 2006-through-2008 time period. Is that right?**

A. **Yes, that's correct.**

Q. **Could you briefly tell the jury what it was you were doing in that time period that related to refrigerators?**

A. **Sure. At that point in time I was back in refrigeration as a director of strategy and planning. My fundamental accountabilities were, No. 1, determine the global business priorities for the refrigeration category.**

**No. 2, what were the entire possible set of important ideas that could contribute and be of value in each of those business priorities. What are all the possible inventions and ideas.**

**No. 3, recommending to the business which ones of these we should begin developing in what order. What we call a roadmap or a technology roadmap.**

Q. **Your job related to global aspects of technologies; is that right?**

A. **Technologies and consumer needs and innovations, yes.**

Q. **It may help us a little bit if you could give us just sort of a simple example of what that might involve.**

A. **Sure. For instance, priorities would be we determined as a global team we need to focus on space and space accessibility inside the refrigerator, which can take many forms. But it fundamentally means the amount of space, how accessible is the space, how well can you design the shelving and the bins and crispers to allow the consumer to better utilize that space.**

**One other area would be in beverage dispensing. A focal area we determined for the business was we needed to maintain and continue our leadership in beverage dispensing and, therefore, think about ideas and inventions and solutions that would contribute in that area.**

Q. **Just remember, I speak slowly, and you want to slow down a little bit, if you can.**

**Very briefly, let's fill the gap between -- I think you said 1998 through 2006 you weren't doing refrigeration. What were you doing in that time period at Whirlpool?**

A. **Yes. I had moved into a number of other roles, and have some very broad experiences in the company. In '98 I moved into a global technology role in dishwashers. After dishwashers I moved into what we call integrated home**

**solutions group, which is Internet-connected appliances. The Internet connected to your appliances, your appliances connected to each other, and access to the functioning of those appliances. I would call it the father of a lot of the work that Whirlpool is now doing in the smart grid initiative that President Obama is pushing, for instance.**

**I moved on from the integrated home solutions group into a fascinating role more in the marketing organization in Kitchen Aid, where I was the category manager, marketing manager for the Kitchen Aid stand mixer and hand mixer.**

Q. **I want to turn back the clock to 1998, when I think you said that you shifted out of the refrigerator project that you had been managing.**

**How was the IDI technology viewed at that point in time where you shifted from it to these other things you have described?**

A. **The project was viewed, frankly, as a game changer. It was a game changer for the advanced development group, because this was the most important, biggest project that had ever come out of advanced development into then engineering and then the product line. It was a game changer for Whirlpool because this was a huge feature in the model line and our strategy going forward to give us premium pricing and to give us -- continue our competitive advantage**

**and leadership in the beverage-dispensing area.**

**Frankly, it was a game changer for my career, because this allowed me to -- this led to promotions, a couple of promotions that I had throughout my career, and really gave me the opportunity to experience a number of other areas in the business that I already mentioned, in marketing, in dishwashers, and in strategic planning.**

Q. **Let's complete your professional career, again just briefly.**

**Prior to joining Whirlpool, were you employed by any other companies?**

A. **Yes, I was. I was employed directly out of school by IBM Corporation. And then some years later by Myles Labs, now known as Bayer.**

Q. **Briefly, with respect to IBM Corporation, what were you doing?**

A. **In IBM I was hired in to very directly use my thermal -- my skills out of college, obviously, in cooling mainframe computers. At that time, these were very large systems that require lots of technology and a lot of very concentrated cooling techniques.**

Q. **Those cooling techniques at IBM, I know a lot of us think about computers have fans in them that blow air over the hot components. Was it that? Or was it something different than that?**

A. **Well, it certainly included fans and blowers. But believe it or not, at that time mainframe computers were cooled by water. There is so much heat inside these products that you have to literally pump water. These are almost room-sized computers, and you're pumping water through this entire system. It is almost like a refrigerator system in the sense that you have a pump that's like a compressor, you are pumping water around the system, like a refrigerant. And you are cooling all the components with heat exchangers and fans, again much like in a refrigerator.**

Q. **At Myles Laboratory what were you doing there, again just briefly?**

A. **At Myles Labs I was designing optical systems and I was also -- I had my first experience in leading a small project for designing a new blood glucose meter.**

Q. **Tell us your educational background. Maybe I should have started there. What is your educational background?**

A. **I have a B.S. in physics from Indiana University. And I also have a Master's in science in thermal engineering.**

Q. **The thermal engineering, thermal sciences, what is that?**

A. **That is the study of the basic processes of air flow, fluid flow, how do things heat and cool, how do you move heat around, how do you keep things cool or warm.**

Q. **Okay. Now, we have covered your background, so let's talk about that next-generation ice and water system that you mentioned earlier. I think you had indicated that was the '94-through-'97 time period. Is that right?**

A. **Yes, that's correct.**

Q. **Okay. Now, how did that start out for you? What was the beginning step or steps that you undertook in your role with that project?**

A. **Before myself and my team could do anything, we had to fundamentally understand the consumer needs. We had to understand what were the consumers' experiences, their dissatifiers, what was frustrating them, what was the system -- what were our products and others not doing for them, what were their fundamental consumer needs.**

**And I basically directly involved myself in initiating and participating in a lot of market research, including visiting appliance stores, watching consumers shop for appliances, talking to salesmen about how they sold appliances and their views of appliances. We actually videotaped these consumers walking into stores and doing this.**

**We conducted things called mall intercept research. We would go to a shopping mall and recruit volunteers to come in and look at ideas that we had and get their reaction to ideas.**

**I would set up three-dimensional prototypes, full, simulated refrigerators. We would recruit people to come in and look at different configurations of ice and water and freezer designs and get their reactions, watch how they reacted as they opened the door. We wouldn't tell them anything, just watch how they reacted when they opened the door. We even videotaped people inside their homes using refrigerators. With their permission, we would set up a video camera that would come on any time anyone or anything would walk into the kitchen. In fact, we even caught a dog one time jumping up on a refrigerator and activating the ice maker to dispense his own ice cubes.**

Q. **In undertaking the research that you just described, what did you learn about likes, dislikes, that sort of thing?**

A. **No. 1, consumers were frustrated with the amount of space they had in the freezer. They were frustrated with the accessibility of where the space was, because at that time the ice maker and the storage system are taking up what I call the prime real estate on that side-by-side freezer at eye level, at hand level. It was all taken up by the ice-making dispensing, dispensing and storage system.**

**We also learned they were frustrated with their access to the ice. You can't see easily into the bin and see how much ice is there. It is not easy to reach in and**

**grab a couple pieces of ice. You have to lift up a door to reach in and do that.**

**They were also frustrated, and it's not something we fundamentally thought about, but we observed consumers struggling in pulling this long, heavy ice bin out of the freezer with sharp edges on the bottom and pouring the ice into a picnic cooler. And the bulk dispensing they were also frustrated with.**

Q. **Was there a solution that you came up with to some of the problems, the likes and dislikes that you identify?**

A. **Well, yes. That solution is IDI, or in-door-ice.**

Q. **Have you prepared a slide for us to kind of help explain the problems and then the resulting solution?**

A. **Yes, I believe so.**

Q. **I think this is slide 2. Is this the slide you were referencing?**

A. **Yes, it is.**

Q. **And on the left, just tell me what it is without going through a description of it. Then on the right, just tell me what that is without yet going through a description it.**

A. **The left side is a picture of our freezer. It is a side view of the freezer, of the traditional design that was in place for probably up to 30 years at that point in time. And it shows the ice-maker components, et cetera.**

**The left side is the new design that represents**

**the in-door-ice design and the view of the freezer of the in-door-ice.**

Q. **Okay. I want you to break this up a little bit so that it doesn't become too long and we can't follow it as easily. But would it help to start with the left-hand side and describe that? And the objective I have here is to ask you to describe what the problems were first, and then we will go to the right and talk about the solutions.**

**Can you use the picture on the left to describe the problems?**

A. **Sure. I mentioned the problems of accessibility and space inside the freezer. So you can see in the upper part of the left figure in yellow, blues, greens showing the ice-maker components and the space that they take up in the prime area of that freezer.**

**If you move to the right side, that figure of in-door-ice, you can see that all of those components have been moved substantially forward or completely on the door of the freezer, so that all of that space interior to the freezer is now available for very valuable shelf space.**

Q. **When you say "very valuable shelf space," is there an illustration that you have prepared of that as well?**

A. **Yes, there is.**

Q. **Let's look at the next slide.**

**Is this the illustration that you prepared of**

that?

A. Yes, it is.

Q. Would you describe what you are illustrating here?

A. So now this is the front view. This is more of a pictorial view of the front of the side-by-side freezer with the doors open. And again, on the left you can see the old design. The dotted line shows that area that the old systems were completely blocking and taking up. Not usable for anything except for ice-making.

You can see on the left side, the new design, IDI, which is shown by the crossed arrows, all of that space is now available for storage. Even up behind the ice maker is available for storage.

You can also see the other consumers' problems that we talked about where the bin is now on the door, easily accessible for removal or access of individual ice pieces.

MR. PARTRIDGE: Your Honor, may I approach the screen?

THE COURT: Yes.

BY MR. PARTRIDGE:

Q. I will speak up for you.

When I look at this, and I see that you have created space over on the right in the freezer as compared to what was on the left, is the inside of the door -- you

**talked about usable space. Is the inside of the door of a traditional ice-and-storage-dispensing system, at that point in time, was it something you would characterize as of limited use? How would you characterize the door itself?**

A. **We would take a look at how consumers were using the various locations in their freezer. And as you can see on the left side, none -- you can see a little bar at the very top or a tiny little shelf. I would characterize this as extremely limited space. In fact, in front of -- on the left side, on the door in front of the box that's a dotted line, none of that is shelf space. None of that is available for storage.**

Q. **Would you turn to your book, tab 4, Defendants' Exhibit 74?**

A. **Exhibit 74?**

Q. **Yes. I apologize, Mr. Myers. It just occurred to me that we may not have connected the dots with respect to your slide 2. So if we could put slide 2 up. You labeled this Whirlpool's '130 in-door-ice technology.**

**So is this a figure that's similar to some of the figures that are actually in the '130 patent?**

A. **Yes, it is.**

Q. **Now, let's go back to Exhibit 74. What is Exhibit 74?**

A. **Exhibit 74 is a presentation that I put together that describes, in a summary way, I think maybe late '96, early**

'97, it is a documentation of a number of solutions that we were proposing to the business that, you can see on this front page, really is listing a very comprehensive list of all the potential consumer dissatisfiers with an ice-water system and freezer.

The document also represents a description of these options, and is also representative of at this point in time a summary of I believe almost all the research that we had done with consumers. We put a timeline together -- I put a timeline together in this document that shows that.

Q. If the jury wanted to look through this, they would see a collection of, as of the '97 time period, the results of the various research that you had undertaken in connection with this project. Is that a fair characterization or not?

A. Well, not exactly. They would see the resulting ideas and proposed solutions that came out of that in-depth research. You would see the evidence of what was some of the research that we had actually done at what points in time.

Q. You mentioned a timeline. Could we turn to page -- let's use the numbers at the bottom of the page. The last three numbers 159. Page 159.

Is this the timeline you were referencing?

A. Yes, it is.

Q. **What is this?**

A. **This is a summary of all of the various studies that I had conducted, that had been conducted, leading up to the end of 1997. And it shows, also, at the bottom the current expenditure of my team in terms of the market research dollars to the tune of** [redacted]

Q. **Now, have you prepared a timeline to help the jury understand the various events that took place during that time period that you described from '93 through '98 and a little later?**

A. **Yes, I have.**

Q. **Could we put that timeline up, please?**

**Is this the timeline?**

A. **That is the timeline, yes.**

Q. **I want to walk you through various stages of the timeline. But before we do that, can you give me sort of a brief overview of what's in the timeline and then we will talk about different points in time?**

A. **This is a very pictorial description of three big phases. The early exploration phase that I already talked about shown on the lower left, which is the next-gen ice and water exploration and brainstorming.**

**Then the next significant phase is in-door-ice research and development, which is the very focused development of technical solutions, solving the problems in**

**a very technical way, from early '96 through mid-1998.**

**Then you see the final phase, the in-door-ice C2C process, which is really doing the detailed design work to create the tooling and the parts that could be manufactured in a very cost-effective way where the Evansville engineering group now is doing all of that detailed design work to execute the design.**

Q. **In the timeline you have indicated a number of exhibits in the upper part of the timeline; is that right?**

A. **Yes, I have.**

Q. **So you picked some points in time to kind of illustrate what took place; is that fair?**

A. **Attempting to illustrate the status of the project or what were some of the types of activities, evidence of what were some of the types of activities going on at that time.**

Q. **Let's take the first of those exhibits. Before you change the slide, let's look at Defendants' Exhibit 239. On the slide you have indicated that is, what, a preview meeting for next-generation ice? Correct?**

A. **Yes. Is this in my book? Should I refer to it?**

Q. **It is in your book, and it is tab 5. Let's go to that.**

**First of all, what is Exhibit 239?**

A. **This exhibit is a typical report out from Evansville engineering on the outcomes of a technical review meeting**

**between the Evansville engineering group and the advanced development group in Benton Harbor, Michigan.**

Q. **At this point in time, which is November 15, 1995, how did the solution that eventually was called IDI fit into this?**

A. **IDI at this time, we are still in the early phase, next-gen ice and water project overall, one of a number of initiatives that we were pursuing and reviewing with engineering, although at that time it was becoming one of the primary and most important solutions that we were assessing.**

Q. **Let's turn to the second page of the document. Would you tell us about item 12? Before you do that, I don't know if Jason or Kelly is doing this, is there a way that you can take item 12 from the bottom of this page and the top of the next page and put them together so we can see all of it? That's great. Why don't you highlight that.**

**What is item 12?**

A. **Item 12 represents a specific level of questions and possible areas of difficulty that the engineering group in Evansville had identified with our proposed in-door-ice concept.**

Q. **It says, "Numerous questions regarding ice storage in the door. How it will be dispensed. How will water be delivered. Will ice be more likely to melt and fuse with**

**door openings for load and unload."**

**What does that mean?**

A. **Would you like me to talk about the specific problems or what's the general nature of these kinds of questions?**

Q. **The general nature of these questions. I don't want to go into it in great detail. But what is it that you are identifying here?**

A. **Well, because we are proposing a significant, basically a complete redesign of an ice-water system that has been in place and refined for 30 years, the Evansville engineering group was expressing a lot of concern about what will happen when we relocate all of these components and the level of concern they had about probably even more issues than this, but a large number of issues involved in moving these components and creating new designs and new interactions between all of these components.**

Q. **And the one that struck me is that, it might be helpful, as I read that last one, about ice more likely to melt and fuse with door openings for load and unload.**

**Can you explain that one, because maybe that is a good example of some of the problems that arose just as a consequence of considering this concept?**

A. **Sure. Believe it or not, your freezer does not have even temperature everywhere, so the door -- you may know from experience that the doors can be a little bit warmer**

than the very interior of the freezer. So if you move ice now to the door, and also, more importantly, if you are opening that freezer door -- when you come home from the grocery store, you are loading the freezer, the door can start to warm up. There are all kinds of concerns about ice possibly melting in that -- when it's stored on the door now.

Other concerns also have to do with as you are blowing air forward and trying to cool the ice maker now and freeze the ice maker, you may start blowing more air into the door area, into the bin, and cause those cubes to what we call sublimate or kind of melt together. They kind of half evaporate. They kind of half melt. And they clump together.

Q. In moving parts of the ice-making system around within the freezer, does that create quality -- quality or reliability issues?

A. Well, it can, and it can very easily do that, because the ice-water system at that time on side-by-side refrigerators was the highest failure area of the refrigerator. Most of the failures are occurring in ice-making, ice dispensing, ice storage and delivery. So when you have a system that had been refined for over 30 years, when you start to break that system apart and reorient and bring them together again, you have a lot of

**concerns that you are going to cause very large problems in quality and reliability that you did not anticipate.**

Q. **Let's go back to the timeline again. I would like to focus on the end of 1995. Your timeline indicates that you have identified an exhibit, Defendants' Exhibit 240. Correct?**

A. **That is correct.**

Q. **And at that point in time, the plan was to do what?**

A. **At that point in time we had determined that we had a primary solution, we had the best idea identified, we had convinced elements of the business, marketing people, that this was a great idea. We were gaining credibility with the engineering organization in Evansville. And now the mission was for the advanced development group to focus almost solely on in-door-ice and develop in-door-ice and show feasibility.**

Q. **Would you turn to Exhibit 240, which is tab 6 in your notebook? We put the front page of Exhibit 240 up on the screen.**

**What is this document?**

A. **Well, this document is a very typical year-end report. I believe my boss at the time, Nihat Cur, he is reporting to the director of the total department, Carlos Coe. And he is reporting out on the 95 accomplishments and what the goals were going to be and priorities for 1996.**

Q. **Let's turn to page 658 at the bottom of the document. Let's turn to page 662, because I think that's what you were just referencing.**

**What is being described on this page?**

A. **Well, this page is talking about key accomplishments, particularly in ice-making and delivery, but also some alternative configurations. This is talking about a set of 1995 accomplishments.**

Q. **If you look under the subtitle "Next-Generation Ice Maker," what is the fourth bullet point?**

A. **Well, the fourth bullet point refers specifically to the in-door-ice storage ideas, that we had developed the ideas, that we were going to then begin to conceptualize or develop more fully those ideas in 1996.**

Q. **You mentioned that this document also talked about the plan for 1996. Would you turn to page 673? What is on this page?**

A. **This page is talking very specifically about those projects that we were going to be executing and focusing on in 1996.**

Q. **Included on that list, under "compact ice maker and in-door-ice storage" is a bullet point, a fifth bullet point. Would you tell us what that is?**

A. **The fifth bullet point is a very specific and detailed description of what our mission was with in-door-ice, which**

**is, we have to go demonstrate feasibility of the concept.**

Q. **Going back to our timeline, what happened next?**

A. **What happened next, we focused the team almost exclusively on this specific idea and this specific technology, which begins the process of conceptualizing specific technical solutions, looking at technical options, beginning the process of designing, building up in the model shop prototypes and testing these prototypes.**

Q. **In your timeline we seem to change characterizations or descriptions of the project itself from next-generation ice and water, which was this initial stage you have described, to something else. And that something else is?**

A. **Specific in-door-ice development.**

Q. **Let's turn to Exhibit 311, which is tab 9 in your book. I apologize, Kelly. Let's go back to the timeline for a second so we can see where this is on the timeline.**

**We are going to jump ahead a bit on the timeline. Do you see Defendants' Exhibit 311 up there?**

A. **Yes, I do.**

Q. **So at this point in time, mid-1997, we are talking about your next sort of event that you singled out for your description of the development. Correct?**

A. **That is correct.**

Q. **And the document you have in front of you, Defendants' Exhibit 311, is what?**

A. **This is a -- this is a presentation that I have made. This is an e-mail and attached to this e-mail is a presentation I made to Louise Goeser, who was the vice president of the North American refrigeration group at that time.**

Q. **Let's take a look at the document. You see the date up there. What is date of the document?**

A. **August 5th, 1997.**

Q. **Is that your name just above the date?**

A. **Yes, it is.**

Q. **And there are a number of people over on the right who are identified. Generally, who are those people?**

A. **Generally, these are the design team, an expanded design team from the prior -- compared to the prior team that had been involved. An expanded team now.**

Q. **You mentioned Louise Goeser, who we have highlighted here. I think you mentioned her title. I think you did. What was her role in this? Why was she involved at this particular point in time?**

A. **At that point, as you move projects through the process within Whirlpool of gaining support and convincing people this is a good project and a good thing to do, she was the leader of the North American business in refrigeration. So you have to convince Louise. Once you convince Louise, that is a big hurdle to overcome.**

Q. **She was sort of the boss of your boss or something like that?**

A. **Or boss of someone else's boss, and you don't do anything unless she agrees to do it.**

Q. **There was a presentation made to her; is that right?**

A. **That's right.**

Q. **And you were present for that?**

A. **Yes, I was.**

Q. **This document is reflective of that?**

A. **This document is the report-out to the team about that that meeting and the outcomes of that meeting.**

Q. **Let's turn to page 143 of the document. Now, on this page it identifies -- it appears to identify the design team members; is that right?**

A. **Yes, that's right.**

Q. **And there is a description of core team and support team. What does it mean to say "core team"?**

A. **These are those individuals that are primarily -- the majority of their job is to -- if not all of it, is to be working on the in-door-ice project at that time.**

Q. **On the left it looks like about 14, 15 people and a couple people on the right. Something like that?**

A. **Yes.**

Q. **Looking at some of the names on this list, can you give us some idea of the level of experience that these**

**people have in the refrigerator engineering business? Just pick out two, three, four of them, whichever ones you would like to choose.**

A. **Sure. This is a mix, as I said, of people out of Evansville and the advanced development group in Benton Harbor. You have a Jim Pastryk, who had probably at that time 30 to 35 years of overall engineering experience.**

**You had Greg Hortin who was our expert in Evansville in ice and water assessments in terms of the applied engineering in Evansville.**

**You have Daryl Harmon, a very experienced designer in Evansville. Probably 20 to 25 years of experience.**

**Jim Peterson, a technician in Benton Harbor, who had probably 25 years of experience at that time.**

**Those are some of the examples.**

Q. **You mentioned in answering that question Evansville. Evansville, Indiana, I assume?**

A. **Yes, that's correct.**

Q. **And you mentioned Benton Harbor. So you had engineers on this team from at least two locations?**

A. **At least two locations and probably, in total, beyond these people that are mostly full-time, a total of probably [redacted] people working on the project at this point in time.**

Q. **Had Whirlpool organized research and develop teams in this fashion previously?**

A. **No, they had not. This was the first time we had ever worked together as a joint team developing and furthering the development of this kind of technology.**

Q. **Why is it that that was done for this particular project?**

A. **Because of the importance of this development and the importance of this technology and feature, it was decided that it was extremely important to accelerate the development of this technology and patent. And, in fact, Louise Goeser, when we presented to her, said you have got to accelerate this at least by a year. This is important enough, we have got to accelerate this project.**

Q. **Was the feedback, then, from her something you would characterize as positive? What would be your characterization of the feedback?**

A. **She felt this was extremely big, very high sense of urgency.**

Q. **Did she indicate a willingness to invest or not to further the project?**

A. **Yes. In fact, the next step, the next clear step was to take this to the board of directors to get funding and final approval to commit to commercializing this technology.**

Q. **Let's go back to your timeline, then. I think you**

have indicated that on the timeline; is that correct?
A. Yes, I have.
Q. Defendants' Exhibit 318, which is the next one on your timeline. I am not sure we actually have that in your notebook. Yes, we do. Tab 10 in your notebook.
A. Okay.
Q. I have it as well. So let's go to Exhibit 318. Would you tell us briefly what Exhibit 318 is?
A. Exhibit 318 is a memo now from Greg Hortin, who had assumed leadership for the project at this point. And he is communicating the outcomes of a high-level meeting around in-door-ice and I believe other technologies or other projects. He is reporting that out to the project team.
Q. Wait a minute. Let's look at the two people here and go over. You are in the middle of that somewhere. Second line?
A. Yes.
Q. So this is a report from April 1st, 1998, that he sent to you and a group of people reporting on this board of directors review, correct?
A. That is correct. But this is not the board of directors review yet, but this is the preparatory presentation that will go to the board of directors.
Q. Let me back up here just a moment, because I may have skipped something on the timeline. I did. I apologize.

**Let's go back.**

**I am not going to ask you much about this document, but I would like to identify Exhibit 241 from October of 1997. What do you characterize as having happened at that point in time?**

A. **I believe what that document is -- is there a tab number on it?**

Q. **Yes, there is. It is tab 7 in your notebook.**

A. **Oh, yes, I see it.**

**This is a typical project, monthly project report out of the advanced development group. And it is reporting out on various activities at that point in time.**

**You mentioned what does this refer to on the timeline. This is simply talking about the continued progression of a development of our technologies. I think it says somewhere in here -- refers specifically to we have now narrowed down our development, for instance, in our motor position, how to design and where to put the motor on the door. We were evaluating two prototype approaches and testing these two approaches with actual prototypes.**

Q. **And I would like to refer you to the second page of the document, under the title "Next-Generation Ice and Water-Phase 2 Indoor Dispenser."**

**Would you explain to the jury what the first two sentences in the first four lines of the document are**

**describing?**

**If we could highlight that.**

A. **This is describing specifically some -- an area of development around how to crush ice, how to dispense ice, crushed and non-crushed, and where the motor might be located above the bin, I believe, and below the bin, that we have tested both prototypes. Both prototypes were functioning.**

Q. **Let's go back to the timeline. We are now back to -- my mistake. I missed this on your timeline -- April of 1998 and the preparation for the board of directors presentation in Exhibit 318. Let's go back to Exhibit 318, which is tab 10 in your notebook.**

**I would like you to turn a few pages in this document, starting at page 634. My question to you, Mr. Myers, is -- I am going to say what is this page and we can all read "in-door-ice," so it is not just this page -- my question is: What is this section of the document, which would include the next several pages? So if you would flip through those and tell us what is in this section of the document.**

A. **This section of the document, the entire document is consisting of a number of potential projects and review of projects, status of projects. Clearly, this is the in-door-ice section that was presented to high-level**

**business leaders, even higher level than Louise Goeser at that time. This section of the document is reviewing the status, the project description. In other words, what is this all about one more time to another level of management, and what is the project? What's the reason for the project? Even the consumer needs for the project. What's the technical status of the project? How are we delivering and funding or supporting the development? What kind of team do we have? And what kind of -- I believe even what kind of schedule do we anticipate that it will take to bring this to market?**

Q. **I have put up page 635 so that everyone can see it. I would like you to just describe, so we have it in the record a bit, what is the project at this point? How is it described here?**

A. **So at this point in time, the in-door-ice project is specifically about indoor -- a door-mounted ice bin storage with an ice maker mounted over that bin when the freezer is in the closed position. It is about providing another cubic foot of shelf space on the inside of the freezer to the consumer.**

**It's also about the suggestion that we introduce this feature first on some of our higher-end or more premium models.**

Q. **The picture on the right is a little hard to make out.**

**I think we have a slide that illustrates this a little bit better.**

**Is this the same picture in a more visible fashion?**

A. **Yes, this is the same picture.**

Q. **And can you briefly describe what's shown here?**

A. **Well, what you will see is you will see in the upper part of the freezer all of that open shelf space now. You will see the ice maker behind a little door in the upper part of that figure, inside the freezer, but it's all the way to the front of the freezer now. You will see the ice bin on the door with an open top. And it's positioned on the door for easy visibility and access.**

Q. **Would you turn to page 642 of the document?**

**How does this relate to the status of the project at this point in time?**

A. **At this point in time, having received so much interest, such high interest from the business, and sense of urgency of developing this project, we had -- this is describing some of those tools that we were going to bring onto the project in terms of additional people, additional technical capabilities, rapid prototyping, that we were going to bring onto the project in an attempt to accelerate the development schedule.**

Q. **In the first section of the page, it says,**

**"Organizational enablers." Then the first bullet point is "Full-time dedicated Evansville R&D engineers and designers."**

**What is that referencing?**

A. **Well, as I have referred to, it is referencing the combined team. But I think even more importantly, it represents the first time that we had committed advanced development engineers to stay on the project all the way through the conceptualization phase, so that we could ensure a smooth and good transfer, and help to keep the project running as efficiently as possible.**

Q. **Is this more or less a turning point? In other words, you have done all the conceptualization, the analysis. Are we about to get into the stage of engineering implementation? Is that what follows this?**

A. **That is exactly what is happening here, yes.**

Q. **Is that then going to be done in Evansville? Is that the decision that has been made?**

A. **Yes. It's actually not a decision. It's a fact that when you move into commercialization, our core engineering group that implements projects is in Evansville, Indiana, but again, it's a huge success to get it transferred, that they are dedicating people now to make this happen.**

Q. **Let's turn to page 644. What do we have on this page?**

A. **What you have here is a typical at that time listing**

**of what are the project financials. How much money are we about to invest? How much money might it be worth initially to the company in the first few years of its launch?**

Q. **And these were numbers, or at least numbers like these, that would have gone to the board for the board to assess whether it was going to fund this thing? Is that the idea?**

A. **It would be an absolute necessity to show the businesspeople and the board what the financial numbers would be.**

Q. **And what did the board do?**

A. **The board resoundingly approved the project. They committed the funds and they committed the organization and the marketing group to putting this into the product plans.**

Q. **Let's go back to the timeline. In the bottom of your timeline you have this in-door-ice C2C process identified. What is that?**

A. **That is the specific applied engineering development. That is the formal development process on a project that is committed to moving to commercialization.**

Q. **What is C2C?**

A. **C2C is Whirlpool nomenclature referring to from consumer to consumer. It refers to the process of -- based on consumer needs, we develop solutions and we deliver them back to the consumer in terms of a manufactured product.**

Q. **Now, I have heard you mention previously the term "tollgates." What are tollgates?**

A. **Tollgates refer to specific points in time where you are checking -- you have management checking on the status of the project. You have specific deliverables at each of these tollgates. And they are making sure you are properly moving through the steps you need to move through so that it continues to be meeting the cost goals, the consumer needs, and it continues to meet the reliability and quality goals, and that it is designed in such a way that it will be manufacturable.**

Q. **What is the first tollgate?**

A. **That would be concept selection milestone.**

Q. **Briefly, what does that mean?**

A. **That means specifically, you have all the technology you are going to implement now, exactly what products, exactly what brands, exactly what small features and colors and finishes are you going to use on this refrigerator, be it a side-by-side or any other products.**

Q. **What is the second tollgate?**

A. **The second tollgate is concept evaluation tollgate, CET, where you know all those details, they have been selected. Now you have developed and proven all that comes together on that specific configuration of refrigerator, you have proven that it will work.**

Q. **There is another tollgate that follows that; is that right?**

A. **That is the BET, the business evaluation tollgate, where all the designs are on paper, all the electronic CAD files are in place, and you are ready to actually cut tools and begin spending the multi millions of dollars that it takes to manufacture a new refrigerator design.**

Q. **Is there another tollgate that follows that?**

A. **Yes. I don't remember the name at the time. Now it's called production release milestone where you have cut all the tools, you have put together the manufacturing line. You have actually run product off the manufacturing line. You have proven you can manufacture it. You are ready to go to market.**

Q. **Were all these tollgates employed during the development of the in-door-ice in that '98-through-2000 time period?**

A. **Every single one of them, yes.**

Q. **As you mentioned earlier, I think you said your role changed at the end of '97 into sometime early in '98 or thereabouts. What was your role with respect to this project from 1998 during this development time period we have talked about?**

A. **In the early part of the C2C process, even though I was no longer on the project, for another 18 months I was**

**still in refrigeration in the global product manager role. But I was a frequent consultant. I was copied on most, if not all, of the key milestones and achievements that were occurring. And I was oftentimes consulted on my opinion on various things.**

Q. **For example, if we went back to Exhibit 318 for a moment and put the title page up, this is that board presentation, the development of the board presentation. While this is after you have more or less moved on in terms of your official duties, nonetheless, you are copied on this document. Correct?**

A. **That is correct. This is a typical example.**

Q. **Is that because you had this ongoing consulting role?**

A. **Yes.**

Q. **When was the IDI technology launched in a commercial product?**

A. **That would be the early spring of the year 2000.**

Q. **Let's go back to the timeline. I think you indicated that on your timeline as well.**

**Was it launched at a trade show?**

A. **Yes, it was. I believe there were multiple trade shows that were occurring.**

Q. **Did you attend any of those trade shows in early 2000?**

A. **Yes, I did.**

Q. **Was there a Whirlpool display booth at the trade show?**

A. **This was one of our bigger trade shows. I believe it was the kitchen and bath show. So, yes, Whirlpool had quite a large exhibit at that trade show.**

Q. **Would you describe the exhibit?**

**Maybe the best way to do that, imagine someone is on the floor and they are walking towards the Whirlpool exhibit, what did it look like?**

A. **When I walked in -- I will just describe personally what I saw. When I walked into the trade show exhibit, these are very large booths. They can be 300 feet by 300 feet in the middle of a large colosseum or sports arena, and so Whirlpool will prominently display in big signs "Whirlpool Corporation."**

**As I walked into the large section of the booth that was associated with refrigeration, all over the booth, big bargains, refrigerators everywhere, the conquest of space above these refrigerators, conquest of space stickers and labels all over the outside of these products and even the inside of some of the open products.**

Q. **What is the relationship, if any, between the products that you were promoting and conquest of space?**

A. **Well, these were -- these happened to be all of the refrigerators that we were launching that had in-door-ice. And they were connecting the tag line, the marketing tag line, "conquest of space," with all the space that we were**

**providing inside the refrigerator as a result of the in-door-ice technology.**

Q. **What was your impression of the reaction to what Whirlpool was displaying in its conquest of space exhibit with respect to IDI? What was your impression?**

A. **I was very excited when I walked in to see all this activity. It was a huge hit from everything I could tell. I couldn't even get some time to talk to my marketing counterpart that I have worked with on the project because he was so busy with customers, talking to them about this feature.**

Q. **At some point you pursued a patent application, correct?**

A. **That is correct.**

Q. **And that's indicated on your timeline as December of 1998, correct?**

A. **That is correct.**

Q. **Let's go to Defendants' Exhibit 8, which is the patent.**

**Is that the patent that issued from that patent application?**

A. **Yes, it is.**

Q. **That's the '130 patent.**

**I would like to go to slide -- I think it's slide 15 that shows Figure 3 of the patent. The one on the**

**left.**

**Just in a few words, could you describe for the jury what your patent is discussing? What was the basic IDI technology?**

A. **So you can see particularly on the left side of this figure, this is focusing you in again on a side view of the freezer, focused on the core elements of the in-door-ice invention itself. So the door is on the right. You can see the ice maker at the upper part of this figure located over the ice bin.**

**You can see the ice bin itself with an auger sitting on the door. You can see the motor, the auger motor, and a long shaft below the ice bin on the door, and the motor is also on the door.**

**Then you see a dispenser area, the dispenser housing through which ice is dispensed out of the ice bin and through the wall of the door to the exterior through the dispenser itself.**

Q. **I am going to take the slides a little out of order, because I am going to try to go through this a little more quickly.**

**I am going to put up some figures from the patent. I would like you to just, as we go through them, identify the problems that were associated with what you see in the figures. And rather than going into a detailed**

**explanation of the solutions, just identify those problems for us.**

**Let's start with slide 8. This is Figure 5. What is the problem that is being solved here?**

A. **We are trying to solve the problem that now that we have moved the ice bin to the door, this ice bin is now moving away from underneath the ice maker every time you open the door. And you don't want ice cubes falling on your feet when you open the door, if it happens to be harvesting ice. And you don't want to break off the sensing mechanism that is reaching down into the bin to sense the ice level in the bin.**

**So we had to solve the problem of developing, designing a sensing system and a sensing system that would prevent that finger from breaking off, would lift that finger up very quickly every time you opened the door.**

Q. **Let's go to slide 9. What is this?**

A. **This is an alternative to using a mechanical finger to sense the ice. This is using an optical system to sense the ice level.**

Q. **That is in Figure 12 of the patent, correct?**

A. **That is correct.**

Q. **Let's go to slide 6. What is the problem that is being solved here?**

A. **Actually, I already referred to this. This is an ice**

door. It's solving the problem of if the ice maker happens to be ejecting cubes, when you have the door open, you don't want those cubes to fall off the ice maker. So this is a door that's in front of the ice maker that holds the cubes back. There is a little flipper, I don't think we show it here, a little flipper on the side wall of the freezer that keeps that door closed so that when you open the overall refrigerator door, this door will keep the ice back inside the ice maker. When you close the refrigerator door back, the flipper moves to the side and now this little door can swing open again to allow the cubes to drop through into the bin.

Q. The first time I looked at these figures, I was confused by the green plate that is in Figure 5. That is actually the same plate that is illustrated in Figure 4, but Figure 5 is just showing it sort of pulled away from the ice maker. Is that right?

A. That is correct. That is a full view of the door pulled away from the ice maker.

Q. Let's go to slide 7. What do we have here?

A. So now that we have significantly moved, completely changed the location of the ice maker, freezers normally have air flow that comes out from the back. Either from the middle or the top of the back of the freezer. So this was helping to solve the problem of how do we direct and guide

that air flow from the back of the freezer over to the back of the ice maker, which is now completely at the front of the freezer. And this is a baffle that is adjusting the air flow so that you don't have too much air flow, which would cause the ice maker to trip too soon and eject wet ice, or you don't have enough air flow so that -- then you would not be producing enough ice. This is a baffle that is adjusting the amount of air flow.

Q. Let's go to slide 10. This is Figure 9 of the patent. What are you illustrating here?

A. What is illustrated here is a little rotating device that helps the ice, jostle the ice and help make it move through the tiny hole that is at the bottom of the ice bin. The ice by itself might not want to fall through that hole because it's not real big. This little blade is jostling the ice as it turns and helping the ice feed through that little hole.

Q. Let's go to slide 12. I am going to skip a few things in case you are wondering. Slide 12, what are you illustrating here with respect to figures -- I guess it's Figure 10 and Figure 11? There is a little misprint on the right-hand side. Figures 10 and 11.

A. Yes. This is showing the mechanical parts that are -- this is the system on how we made, we designed this ice bin to fit very rigidly on the door and still be easily removed

**by the customer, because ice makers -- the ice bins in the 30-year-old design had been contained within long rails, very securely fixed on all four sides within the freezer. Now we were putting this ice bin in a different location, in a different orientation, and we could only hold the ice bin by the bottom part of the bin, and there is a lot of forces at work when you start turning the ice auger, the ice motor and breaking up all of that ice.**

**This is the way that we designed to make that bin very rigid and yet easily removable by the consumer.**

Q. **Let's go to slide 13. This is Figure 9. What are we illustrating here? In particular, I would like you to focus on whether this crushes ice and if so how.**

A. **Yes. Our design did allow for cubed and crushed ice. The arrows are referring to a particular solution that we implemented around having in the bottom of this bin these kind of serrated fingers that are rotating around a cylinder. And these fingers grab the ice in one direction, and we have stationary blades that these fingers rotate through and grind up or crush the ice in the bottom of this bin.**

**If you don't want crushed cubes, these fingers rotate in the other direction, and the cubes don't pass through the crusher blades. They pass directly out of the bin and they are not crushed.**

Q. **Mr. Myers, during the course of your work on the IDI project as you have described it, did Whirlpool consider putting the ice maker on the door?**

A. **Yes, we did.**

Q. **What were the pros and cons that you considered at the time with respect to that?**

A. **Well, the pros are it gives you a little bit more space in the top of the freezer. Of course, we want to give the consumer as much space as possible.**

**However, there are, you might remember one of the documents, all of these different consumer needs that we listed out. Consumers also care about how much ice capacity they have and how much access to ice.**

**When we considered putting the ice maker on the door, it was going to more or less prevent the consumer from reaching directly into the bin and grabbing any individual ice pieces because now you have got the ice maker right over the door and it was going to provide less ice capacity and recovery rate, because you have to design now a smaller ice maker that can't produce as much ice. And it then starts to impact the size of the bin. So you store less ice as well.**

**When we looked at the total set of consumer needs, the optimal design was the approach we took with the ice maker not on the door.**

Q. **Would you turn to tab 11 in your notebook, PTX,**

**Plaintiffs' Exhibit 379? I believe this is a Whirlpool patent, which I will call the '624 patent. Do you see that?**

A. **Yes, I do.**

Q. **If we could look at the inventors here, Mark Nelson and Jim Pastryk. Do you see those names?**

A. **Yes, I do.**

Q. **Were they involved in the IDI project?**

A. **Yes. Mark and Jim were team members and also on the patent for IDI.**

Q. **I note that this was filed on December 28, 1998. Is that right?**

A. **That is correct.**

Q. **So this is concerning technology developed at Whirlpool prior to December 28, 1998; is that correct?**

A. **Yes, that's correct.**

Q. **And what is it generally that this patent shows?**

A. **Well, first, generally, this patent is showing an ice maker on the door of a closure member or a freezer compartment.**

**Secondly, it's showing some inventiveness around -- some new ideas around how to control the amount of ice in the bin, not just keep it from overflowing, but actually control the amount of ice so it doesn't get stale. You don't use much ice. You only want to have that much in the bin.**

**This is also talking about the idea of moving that ice maker up and down on the door, and therefore, it will control -- that controls the amount of ice that is actually produced and stored in the bin.**

Q. **So if we look at Figure 2, Element 22, we will color that in yellow, and that would be the location of an ice maker on the door, and just below that is what I think would be item 24, which is a bin on the door. Do I have that right?**

A. **Yes, you do.**

Q. **Now, I notice that you weren't named on this patent as one of the inventors. Was the concept of ice maker on the door something your team discussed during the course of the project that you led?**

A. **Yes, we did.**

Q. **Are you familiar with a project at Whirlpool called the IDI 2 project?**

A. **I know generally what IDI 2 is, yes.**

Q. **That is a project, I take it from your answer, that you have not been directly involved in?**

A. **That is correct.**

Q. **What is the subject matter of that project?**

A. **I can recall that one subject matter was to -- was the development of an approach or using the approach of putting the ice maker on the door.**

Q. **How would you view the relationship of that to what you were doing in the '90s, if any?**

A. **I would view that as a normal progression -- as ice and water leaders in the industry, a normal progression of additional investigations. What else can we do? We are always looking at consumer needs, evaluating what the consumer is saying to us.**

**But, still, in the context of exploring various ideas, this would represent, I would say, a fairly typical next step in exploration and evaluation of the concept and the cost of doing so, the quality of doing so.**

**THE COURT: Let's take our morning break.**

**MR. PARTRIDGE: Your Honor, I have two or three questions.**

**THE COURT: Okay.**

**BY MR. PARTRIDGE:**

Q. **How widely does Whirlpool use the IDI system today?**

A. **I don't know the exact figures. I know -- I am pretty sure it's at least over half of our side-by-side refrigerators right now, if not three-quarters.**

Q. **And how, from your point of view, has it been received in the marketplace?**

A. **It's been a huge hit, no question.**

Q. **And how is it that you rate or rank IDI as compared to some of the other technologies that Whirlpool has introduced**

**in the refrigerator space in the last 10 or 15 years?**

A. **This is, no question, the biggest hit, the biggest development, the most successful innovation that Whirlpool has had in refrigeration in at least probably the last 20 years.**

**MR. PARTRIDGE: No further questions.**

**THE COURT: We will have cross-examination after our morning break.**

**(Jury leaves courtroom at 11:00 a.m.)**

**(Recess taken.)**

**THE COURT: Ms. Walker.**

**(Jury enters courtroom at 11:25 a.m.)**

**THE COURT: All right, ladies and gentlemen. Please take your seats.**

**Mr. Herrmann, you have some books there?**

**MR. HERRMANN: We do, Your Honor.**

**THE COURT: Mr. Sharma, are you handling this inquiry?**

**MR. SHARMA: Yes, Your Honor.**

**Your Honor, we actually also called Mr. Myers in our case-in-chief. We worked out with Whirlpool's counsel that we do all the questioning in one sitting.**

**CROSS-EXAMINATION**

**BY MR. SHARMA:**

Q. **Good to see you again, Mr. Myers.**

A. **Hello, Mr. Sharma.**

Q. **I have a few discrete points that I would like to talk to you about. Before I get to those, I would like to first talk to you about what Whirlpool has not put in issue in this litigation.**

**One of the first things I would like to talk to you about was one of your exhibits, the '624 patent. Do you recall giving testimony about the '624 patent of Whirlpool?**

A. **I remember talking about another patent. I don't remember if it was '624 or not.**

Q. **Can you pull up PTX-379, please?**

A. **Is this in my binder here?**

Q. **It is in the binder that Mr. Partridge was talking to you about. It's also on the screen. My question is a simple one. Whirlpool is not asserting this patent in this litigation, is it?**

A. **No, they are not.**

Q. **Now, you also earlier today talked about bridge breaker blades, mounting plates, other sorts of technology that you worked on. Do you recall that?**

A. **Yes. I recall talking about technologies that my team worked on, yes.**

Q. **"Bridge breaker blades," those words don't appear in any of the asserted claims in this patent. I am referring particularly to -- Mr. Brooks, this is slide 2?**

**Those words don't appear in any of the claims asserted in this case; isn't that correct?**

A. **They appear in the embodiment and the examples that we show. They do not appear in the claims.**

Q. **Mr. Brooks, if you could pull up Claim 7 of the '130 patent.**

**Do you see the phrase "breaker blade" in Claim 7?**

A. **Yes, I see it.**

Q. **Claim 7 is not asserted in this litigation, correct?**

A. **I am not familiar with exactly what claims are being asserted or not. I haven't studied the whole range. I don't believe so, but I don't know that I can factually answer that.**

Q. **How about mounting plates? You talked about mounting plates on your slide 4.**

A. **Yes, I see it.**

Q. **Mr. Brooks, if you can bring up Claim 16 of the patent.**

**I believe Claim 16 also talks about mounting plate. Claim 16 is not asserted in this litigation, is it?**

A. **Again, it's an example of one of the ways we have demonstrated to solve all the problems that we had. But I don't believe it is asserted, no.**

Q. **Now, Mr. Myers, you also talked about shut-off**

**mechanisms and optical sensors. Do you recall that?**

A. **Yes, I recall that.**

Q. **That is not in the asserted claims, either?**

A. **Also another important way to make the system work and we should disclose it as part of the patents. But I don't believe we are asserting it here.**

Q. **I will come back to those two features, the shut-off mechanism and the optical sensor, later.**

**What I would like to do, you talked about, I believe it was a consumer research that was done in I believe 1994. I don't know if I'm characterizing it correctly. Do you recall that testimony you gave to Mr. Partridge?**

A. **I recall talking about a wide range of market research that I was accountable for and did conduct throughout the project.**

Q. **Did it start in 1994?**

A. **Yes, if I recall, I believe some of the market research did begin in 1994.**

Q. **What I would like to do is take you back to 1994 so we can all get a feel for what you believed consumers wanted and what already existed by that time. Do you understand?**

A. **Sure.**

Q. **Now, by 1994, it was common knowledge to include an ice bin in a refrigerator, right?**

A. **Well, certainly, for 30 years you could find refrigerators that had ice bins sitting inside a refrigerator, yes.**

Q. **And it was also common knowledge that the ice bin was removable?**

A. **Certainly, you could see ways for the ice bin to be removable from the interior of a freezer, that's correct.**

Q. **And you also agree that by 1994, refrigerators included an ice bin below an ice maker?**

A. **Yes. I will say that it was common knowledge that in this 30-year-old design the ice maker would be placed over the ice bin. But it was certainly not common knowledge on how you would arrange those components and design them if you moved those components from that 30-year-old design.**

Q. **And automatic ice makers, you will agree that by 1994 automatic ice makers were well-known in the refrigerator industry?**

A. **Again, ice makers and automatic ice makers had been used for a long time in a very standard inside-the-freezer configuration, that is correct.**

Q. **And it was known that an ice maker and an ice bin could be sized such that they could fit together within a refrigerator?**

A. **Well, we certainly had an example in front of us of a particular ice maker and a particular ice bin inside the**

freezer compartment that were sized to work together. I have never seen any of those sized to work together on the door.

Q. Let's talk about Whirlpool's IDI. Isn't it true that Whirlpool kept the size of the freezing portion of its ice maker relatively the same for purposes of the IDI project?

A. It is true that a component of the ice maker, we used the same technology and rough size of the part of the ice maker that freezes the ice cubes.

Q. Is it fair to assume you have heard of General Electric?

A. Yes, I have heard of General Electric.

Q. GE was also making automatic ice makers before 1994, correct?

A. If I recall correctly, yes.

Q. Let's turn to, this will be the binder that was placed before you for purposes of my questioning. Tab 4 of that binder, it's PTX-177.

If we could bring that up on the screen, please.

We talked about this document before at your deposition. Do you recall that?

A. I recall you showing me some document. I don't remember if it was this one or not.

Q. And this is a GE service manual?

A. It says it's a service handbook. I don't know if that

**is classified as a service manual or not.**

Q. **From the dates on the face, at least it appears that this is talking about models that are before 1994, correct?**

A. **It appears that that is what it says, yes.**

Q. **Now, if you could please turn to what is labeled -- you will see at the bottom of the page as you turn, there is a label called "Page D-1." Can you turn to that?**

**Can you also turn to that, Mr. Brooks?**

A. **Some pages in?**

Q. **Yes. I will try to count off the best I can. 1, 2 -- 3. "Page D-1" on the right side.**

A. **Yes, I see the page.**

Q. **You will agree this shows examples of known ice makers by 1994, correct?**

A. **This looks like an ice maker I may have seen, that is correct.**

Q. **And there are two different types. On the left there is a Figure 2, and that's a sweep-type automatic ice maker?**

A. **I see the words. I am not completely familiar with what that may be referring to. I don't recall at this point.**

Q. **How about the snap action-type automatic ice maker?**

A. **Again, I see the words. I am not familiar with exactly what these words are referring for in these designs.**

Q. **But you are generally aware of these as known**

automatic ice makers well before 1994, correct?
A. Well, I am generally aware that GE had ice makers, like most companies did. And I am generally aware that they did use a cylindrical ice cube-type approach.
Q. Now, let's go to Page D-16 of this document.
Mr. Brooks, if you can also pull that up on the screen, please.
We also talked about this page at your deposition. Will you agree with me that what is shown over Figure 18 is a refrigerator door and the compartment, freezer compartment or the freezer cabinet of a refrigerator?
A. I don't know that I can say that, because I know there is lots of single-door refrigerators out there. So based on this figure, I can't testify that I know that this is a freezer compartment.
Q. Let's see if the text can help you. But before we go there, you will agree that that says "ice maker" in that cabinet there?
A. Yes, I see some words that look like they say "ice maker," correct.
Q. And you see it says "ice bucket" on the door there?
A. Yes, I see it says "ice bucket" on the door.
Q. Are you aware of any refrigerator or fresh-food cabinets or compartments that have ice makers in that

**configuration, before 1994, of course?**

A. **Well, in the U.S., no. I can think of some Asian designs that did some unique things with ice-making. And I specified compartments that might be in the same area. But I don't believe I recall any U.S. refrigerators, no.**

Q. **And this is a GE manual, correct, for the U.S.?**

A. **That is what you are placing in front of me. It says "GE" on it.**

Q. **Mr. Brooks, if we could slide that figure to the right somewhat.**

**Do you see the words "freezer compartment"? And we can have it blown up if you need it blown up for you.**

A. **Would you, please?**

**I see where you are pointing to.**

Q. **Freezer compartment.**

**Mr. Brooks, we can go back to the figure, please.**

**We are talking about a freezer compartment side of a refrigerator here, correct?**

A. **Well, the words all seem to point to that.**

Q. **And earlier today you had a few pictures that you were talking about, and one of the pictures you were talking about is in the old refrigerators, before, there was no space on the freezer door to put anything. But it looks like GE figured out how to create some space on the freezer**

**door to put stuff. Right?**

A. **No, that's not correct. I said that, referring to refrigerators that are automatic ice-dispensing refrigerators in the standard designs at the time that dispensed through the door, there was no space on the upper part of the bin, and maybe I didn't specifically say it, but there was no space on the upper part of that door for any significant storage of food.**

Q. **Now, you also talked about if you put an ice bin on a door, it's going to be exposed to warmer elements. The door opens and closes, warm air will come in, it's on a warmer part of the refrigerator. Do you remember that testimony?**

A. **Yes, I remember talking about that.**

Q. **It looks like GE figured out how to put an ice bin on a door before 1994, correct?**

A. **Well, I would -- in the context of what we have been talking about here, GE did not put an automatic dispensing ice bin on the door. And I absolutely cannot speak to whether or not they had any freezing or clumping problems on that ice bin or not. They may have. They may not have.**

Q. **Let's go back to the text of D-16.**

**You talked, also, about -- I believe you talked about a shut-off mechanism, optical sensor. Do you recall that when you were describing the IDI invention?**

A. **Yes, I do.**

Q. **This GE refrigerator has the ice bin on the door, so if the door opens, you mentioned one of the problems that can happen is ice from the ice maker can fall on the floor if you don't have a shut-off mechanism. Right? Do you remember that testimony?**

A. **Yes, I remember that.**

Q. **Let's see what GE did. It looks like they got an ice door switch that interrupts the circuit to the ice maker when the ice service door is opened. Do you see that?**

A. **I see those words, yes.**

Q. **It looks like GE figured out how to do that before 1994, right?**

A. **No, I would not agree. And I have not studied this document. But if I read simply the words, that they would shut off the circuit breaker, you can shut off a circuit breaker and still have ice falling out of the ice maker because of gravity. It may be on the edge of the ice maker. That was exactly the problem. We also -- if I recall correctly, we considered or did shut off the circuitry, maybe we shut off the circuitry. But the problem we had was it wasn't the fact of shutting off the ice maker that was the problem. It was how do you stop the ice from falling off the ramp or the edge of the ice maker. Even though it was a rare occurrence, we did not want that to happen to our customers. I don't see where they solved that problem.**

Q. **You also talked about today an optical sensor.**
A. **I talked about an optical sensor in the context of sensing the level of ice in the bin, in that case.**
Q. **Mr. Brooks, if we can go to the text of this page and blow up Figure 18. "When the ice level reaches a maximum height, the light beam to the photo switch is interrupted by the ice cubes." This is generally known as an optical sensor, correct?**
A. **Well, optical sensors are used for all kinds of things. I haven't studied the context of this figure or paragraph. I am not sure exactly what it is referring to here.**
Q. **Mr. Myers, let's talk now about some consumer expectations from your 1994 research. You agree by the 1994-1995 time period, consumers had an expectation for automatic ice makers in refrigerators, correct?**
A. **No, I would not characterize it that way. We knew that our fastest-growing refrigerator segment was side-by-sides. We knew that this was our most profitable segment. We knew that the consumers were buying side-by-sides. Those that were buying side-by-sides were most interested in ice-making and delivery. But I can't say that all refrigerator consumers had an expectation for automatic ice makers. I believe at that time the majority of refrigerators did not have automatic ice makers.**

Q. **Let's focus in on that subcategory that you talked about, refrigerators that have ice delivery through the refrigerator door.**

A. **Sure.**

Q. **You are referring to an automatic delivery, something where you take your cup, you press one of the pads on one of these refrigerators, and the ice comes through the door right into your cup. Correct?**

A. **That is the external -- that is the external result, yes, of what a consumer does when they use a cup to get ice.**

Q. **Your research in 1994 showed that that was a feature that consumers desired?**

A. **Our research in 1994 showed that it was a desirable feature and particular reason for people purchasing side-by-side refrigerators.**

Q. **And you would agree with me that by 1994, refrigerators that had this feature of automatic through-the-door dispensing device, consumers also desired that they have automatic ice makers inside?**

A. **I would say that we knew a significant number of people had a preference for automatic ice makers that dispense -- that produce ice, store it in an ice bin, and deliver it through the door.**

Q. **I apologize, it could be my confusion and hearing. Is that a yes?**

A. **Well, you -- yes, that is a yes in terms of automatic ice-making. But they also need the other elements to make that a viable and valuable feature for them. Not just the automatic ice maker.**

**The answer is yes.**

Q. **Thank you, Mr. Myers.**

**In the binder in front of you, I am going to be talking to you about -- what has made the binder so thick is we have got the prosecution history of your '130 patent in here. That is in tab 2, PTX-10. If you could turn to that, please.**

**Mr. Brooks, if you could bring up PTX-10.**

**Mr. Myers, you recall at your earlier deposition we talked about the prosecution history as well?**

A. **Yes, we did.**

Q. **And I would like to turn you to -- we have got page numbering on the bottom corner to help you out. I would like to turn you to page 199.**

A. **I don't appear to have page numbers on mine.**

**THE COURT: Is this tab 2?**

**MR. SHARMA: Tab 2, PTX-10.**

**THE COURT: Mine doesn't, either, Mr. Sharma.**

**MR. SHARMA: We will have to do this a slightly more difficult way.**

**BY MR. SHARMA:**

Q. **We are going to have to try to do -- actually, we can do it on the screen. I have got it up on the screen. Is that fine?**

A. **That should be fine, sure.**

Q. **So here is page 199. You recall we talked about this page at your deposition?**

A. **It's hard for me to see here.**

Q. **Let's blow up paragraph 2. We talked about this at your deposition. This is the Patent Office rejecting certain claims of your patent application; is that right?**

A. **Well, I recall the conversation about patentability and there being a conversation in theory at the Patent Office. I don't know that I remember this specific paragraph. Just to be clear.**

Q. **MR. Brooks, if you could highlight the first two sentences.**

**The Patent Office is rejecting the claims, and one of the references it's using is a Gould reference. Correct me if I'm reading this wrong. "Gould discloses a refrigerator having an ice maker and an ice storage bin 68 mounted on the door 14 of the refrigerator."**

**That is what the examiner was telling Whirlpool in the rejection?**

A. **Again, I don't know the context -- you are telling me the context for this. I have studied the patent history**

months ago a little bit. I will just say that there is a sentence about this. I take your word that it does refer to that conversation. I can't factually recall or trace back right now on that.

Q. But this is your patent application process, and you have read this prosecution history before, correct?

A. This is the Whirlpool patent application process, and very little engagement from the engineers actually occurs with the patent application process, what is called the prosecution.

So I did briefly review it six to nine months ago in preparation at that time.

Q. Mr. Brooks, can you bring up PTX-127 and try to split the screen so we can get them both up?

PTX-127 is also in your binder, but we have it here. Whatever your preference is. This is the Gould reference that the examiner is referring to.

Mr. Brooks, if you can enlarge the figure.

So the examiner is saying, "Gould discloses a refrigerator having an ice maker in an ice storage bin mounted on the door of the refrigerator."

Now, will you agree that in the Gould reference there is an ice maker in the door.

MR. PARTRIDGE: 617, Your Honor.

THE COURT: Do you want to state the basis of

**the objection?**

**MR. PARTRIDGE: Lack of personal knowledge.**

**THE COURT: Well, you want to establish the foundation for your question, if you can?**

**BY MR. SHARMA:**

Q. **Mr. Myers, we talked about the Gould reference before during your deposition, correct?**

A. **We talked about the fact that there was a Gould patent, yes.**

Q. **And we talked about how this element 26 is an ice maker, automatic ice maker, correct?**

A. **I remember you asserting that it was an ice maker. I remember replying that I couldn't confirm whether that was an ice maker or not, not having studied any of this patent before.**

Q. **You can't confirm that that is an automatic ice maker. Is that your testimony?**

A. **That is my testimony.**

Q. **And you can't confirm that that is an ice storage bin. Is that your testimony?**

A. **That is my testimony. I have never studied the patent before. I can see there is some numbers and words there, but I have never studied this patent.**

Q. **Do you recall us talking about how this Gould reference is a freezerless refrigerator?**

A. **No, I don't recall talking about freezerless refrigerator.**

Q. **Now, Mr. Brooks, if we can turn to page 227 in the prosecution history.**

**Mr. Myers, do you recall us also talking about an interview summary at your deposition?**

A. **Yes, I recall in general that we talked about this, that's correct.**

Q. **And this interview summary is a summary of an interview between the patent examiner and Whirlpool's Joel Van Winkle. Do you recall that?**

A. **I believe generally that's what this represents, correct.**

Q. **And it's your understanding that Whirlpool, Mr. Van Winkle, likely met with the examiner to try to get those claims that were rejected allowed?**

**MR. PARTRIDGE: Objection, Your Honor. Lack of personal knowledge.**

**THE COURT: I will sustain that.**

**BY MR. SHARMA:**

Q. **Mr. Myers, do you see under the description -- if you could highlight the first phrase, Mr. Brooks.**

**Mr. Myers, you recall that we just saw the examiner's rejection based on Gould, correct?**

A. **You pointed out a section that discussed that, that's**

correct.

Q. And now I am pointing out a section in this examiner interview summary where the examiner is summarizing the context of the interview. Do you see that highlighting?

MR. PARTRIDGE: Your Honor, same objections. Lack of personal knowledge, calls for speculation. He wasn't at the interview.

THE COURT: Let me see counsel.

(The following took place at sidebar:)

THE COURT: I don't know exactly how you might go about getting it in. It seems you should have some way.

MR. SHARMA: He was also the 30(b)(6) witness on the prosecution history. That is the deposition that I am referring to. We walked through the process. He spoke with Mr. Van Winkle as part of the preparation.

THE COURT: Now we have got the rules of evidence that have to be applied in front of the jury rather rigorously. I think you would agree, Mr. Sharma?

MR. SHARMA: He also as part of that process told me his personal view of what he thought that statement meant.

THE COURT: Why don't you impeach him?

MR. SHARMA: I will do that.

MR. PARTRIDGE: Your Honor, he wasn't at the interview. This is all speculation about it.

**THE COURT: If he just discussed it, if there is a prior inconsistent statement, Mr. Partridge, you can adduce that.**

**MR. PARTRIDGE: I don't think there is a prior inconsistent statement then.**

**THE COURT: I agree that that is why we are here at sidebar.**

**MR. PARTRIDGE: We do have an expert who studied this and they can inquire.**

**THE COURT: That is sort of what I was alluding to. Is there not another mechanism, another witness through which -- keep in mind, you guys are on the clock. Okay?**

**MR. SHARMA: Yes, Your Honor.**

**THE COURT: You have a rather loquacious witness here.**

**MR. SHARMA: I will move very quickly from this topic, if I can just have a question or two.**

**THE COURT: Sure. But I called you over here to have the discussion we are having, the objection is well-taken, to suggest maybe there is another approach you might want to take.**

**(End of sidebar conference.)**

**BY MR. SHARMA:**

Q. **Mr. Brooks, if we can please pull that back up.**

**Now, Mr. Myers, this statement that is**

highlighted in yellow, it's your understanding that this would be a point that was made by Whirlpool's Mr. Van Winkle to get the claims allowed, correct?

MR. PARTRIDGE: I object, Your Honor.

THE COURT: If he can answer it. I will let him answer that question.

THE WITNESS: No, I have no knowledge of that. I do not know that Mr. Joel Van Winkle was the particular individual that was actually present or that this was a statement that was made between Mr. Joel Van Winkle and the examiner. I don't know that.

BY MR. SHARMA:

Q. You don't believe this was a point made by Mr. Van Winkle to try to get the claims allowed. Is that your testimony?

A. I don't believe or disbelieve. I was not present. I have had no evidence presented to me or no knowledge that he was the one that made such statement and when.

Q. Mr. Myers, I have talked about the deposition that I met you at before. Do you recall that deposition?

A. Absolutely.

Q. And you recall at the beginning of that deposition I asked you if there was any reason that you could not provide me with truthful and accurate testimony. Do you recall that?

A. **I absolutely recall that.**

Q. **I would like to present you with a portion of that deposition. I am going to give you the entire transcript and direct you to a particular page.**

**MR. SHARMA: Your Honor, may I approach the witness?**

**THE COURT: Yes.**

**MR. PARTRIDGE: Your Honor, I would request that before he puts the statement up, that he identifies it for him so I can determine if it is proper impeachment.**

**THE COURT: Absolutely. I think he intends to do that.**

**THE WITNESS: And I am referring to this statement in particular --**

**THE COURT: Sir, there is no question.**

**THE WITNESS: Sorry.**

**BY MR. SHARMA:**

Q. **Referring to page 220, Mr. Myers, page 220, starting at line 1.**

A. **220.**

**THE COURT: Hold on. He is going to ask you a question, as soon as Mr. Partridge gets a chance to locate the page.**

**Go ahead, Mr. Sharma.**

**BY MR. SHARMA:**

Q. **Have you located that testimony?**

A. **No, I haven't.**

Q. **Page 220, line 1.**

A. **Is it 220 of the individual pages in here?**

Q. **Yes. There should be a small page number on the top corner.**

A. **687 -- hold on.**

**MR. SHARMA: Your Honor, may I approach?**

**THE COURT: Yes, you may.**

**BY MR. SHARMA:**

Q. **That's it.**

A. **Okay.**

Q. **Mr. Brooks, could you please play the video?**

**"Question: Why did Whirlpool meet with the examiner after the examiner rejected the claims other than to try and get the claims allowed?**

**"Answer: My understanding of the prosecution here is that this was likely related to asking exactly for that.**

**"Question: So you do agree, then, that Mr. Van Winkle met with the examiner to try to get the examiner to change his mind with respect to the rejection of Claims 1 through 5 and 9 -- correct?**

**"Answer: The facts, as I understand them, is we have evidence that there was a direct conversation and**

**meeting that was between the examiner and Joel Van Winkle. Mr. Van Winkle does not recall the content of the conversation, but I -- we do have evidence that the claims were later allowed.**

**"Question: Why else would Mr. Van Winkle go to meet with the patent examiner other than to get the claims allowed?**

**"Answer: I have no idea why Mr. Van Winkle would travel there for purposes other than this."**

**BY MR. SHARMA:**

Q. **Mr. Myers, I would like to move to another topic, the '130 patent. This is PTX-009. This is tab -- I believe it's tab 1 of my binder. I think it's also in yours. But it's tab 1 of my binder. This is the '130 patent, correct?**

A. **Yes, that's correct.**

Q. **You have seen this before?**

A. **Oh, yes. It's my patent. I have seen this before.**

Q. **You have read it a few times, correct?**

A. **I have read it a few times more recently, yes.**

Q. **You will agree with me that the only location shown and described in this patent for an automatic ice maker is on the ceiling of the freezer cabinet. Correct?**

A. **Well, what we have done is shown one option or embodiment that includes the ice maker on the ceiling. But there are other locations or mounting places that can be**

**accomplished with this technology.**

Q. **Mr. Myers, the '130 patent does not show an ice maker mounted on a freezer door; isn't that right?**

A. **The '130 patent shows a way that we chose to -- that we felt was optimal. Again, the patent technology can be implemented in a number of ways. And in this particular instance, it does not show the ice maker on the door, you are correct.**

Q. **And the '130 patent also does not show an ice maker mounted on a fresh, smooth door, right?**

A. **We chose to show a side-by-side product and show it mounted in a freezer. But it does not show it mounted -- in the example that we decided to document, it does not show it on a freezer door.**

Q. **You will agree with me that it's not fair to claim that you have invented something while at the same time not disclosing it to the Patent Office?**

A. **Well, I think that's a very broad generalization. We are always inventing things. I am not a legal expert, so I would -- I am not sure I know how to answer your question.**

Q. **I am going to move to another topic.**

**I think you indicated that in the 2006-2008 time period, you returned back to refrigeration at Whirlpool?**

A. **Yes, that is correct.**

Q. **And what was your position then?**

A. **I was a global director, global product development director.**

Q. **And at that time what type of work did you do? I know you mentioned earlier it had to do with more analysis of the market, consumers, et cetera.**

A. **No, that's not what I said. It had to do primarily with defining what the priorities for the business were in terms of product development, developing and organizing ideas on possible solutions against those business priorities. And then which of those priorities did it make sense for us to pursue on a global basis.**

Q. **Now, Mr. Myers, the IDI feature, you will agree with me that with the IDI feature, consumers can only see this feature if they open up the door of the refrigerator?**

A. **Yes, I would agree that that is where you see the change in the design of the product. Of course, in my experience, almost every consumer opens the door when they go shopping.**

Q. **And you will also agree with me that with respect to exterior technology, this could be seen by consumers without opening any of the refrigerator doors. Correct?**

A. **Would you clarify what you mean by "exterior technology"?**

Q. **Sure. Let's look at the ice and water dispensers. Let's say an extendable tray down here and an extendable**

**spigot up here.**

A. **You are referring to ice-water-type features?**

**THE COURT: Let him finish the question.**

**THE WITNESS: I am sorry.**

**THE COURT: Go ahead.**

**BY MR. SHARMA:**

Q. **That is an example of an exterior feature, correct?**

A. **Yes, I understand.**

Q. **Consumers don't have to open the door to see that, right?**

A. **Well, they certainly don't have to open the door to see it. They may need some additional explanation as to what they are actually seeing when they look at that.**

Q. **And the extendable tray and a water spigot that extends through some sort of spring mechanism, that is LG's '121 patent that is at issue in this case. Correct?**

A. **I believe so, by hearsay. But I don't factually know what the patent number is.**

Q. **Let's look in your binder. This is PTX-155.**

**Mr. Brooks, if you could please pull it up on the screen. Mr. Brooks, if you could just expand the top e-mail.**

**Mr. Myers, if you could let me know when you are there, or you are welcome to look at the screen.**

A. **PTX-155?**

Q. **Correct.**
A. **I am there.**
Q. **This is an e-mail from you, Verne Myers?**
A. **It appears to be.**
Q. **This is to Henry Marcy?**
A. **Yes.**
Q. **Who is Mr. Marcy?**
A. **He was -- let's see, what is the date on this, I am sorry?**
Q. **Let's confirm. 2/11/2007.**
A. **Yes. He was my supervisor at the time.**
Q. **Let's go to the second sentence, if we can highlight that, "Looking at the competitive environment." So it seems that in 2007 Whirlpool was losing share to at least LG, correct?**
A. **That's what I believed at that time, yes.**
Q. **And if you could highlight the next sentence, Mr. Brooks.**

**I am sorry, if you can confirm the IDI that is in the first sentence, that's the IDI you are talking about, the '130 patent, correct?**

A. **Yes, that is in-door-ice.**
Q. **The second sentence, "The common theme seems to be exterior aesthetics and/or exterior technology."**
A. **Yes, I am referring to at that point in time the**

**situation in the market on exterior aesthetics.**

Q. **And Whirlpool is losing share to LG because of exterior aesthetics and technology?**

A. **I believe that generally was the case that was beginning to occur some seven years after we introduced the in-door-ice products.**

Q. **And you will agree that this also speaks to how fragile interior features are on the showroom floor, correct?**

A. **I would generally agree that it's easier to talk about exterior features without people and salesmen in place. And I would agree at this point in time, there seemed to be more fragility of some of the interior features and innovations that were in place.**

Q. **So in your view, exterior features are better and more visible features for consumers on a showroom floor?**

A. **I can't actually say that today. I know that as consumers are continually changing their buying preferences, they are continually changing the way we show products in the market, and that when IDI was released, it was hugely successful as its feature. At this point in time I had a belief, as trends have developed and new features coming on board, that exterior features were becoming more prominent at this point, yes.**

**MR. SHARMA: Thank you for your time, Mr. Myers.**

**I have no additional questions.**

**THE COURT: Redirect.**

**MR. PARTRIDGE: Yes, just a couple of questions, Your Honor.**

**REDIRECT EXAMINATION**

**BY MR. PARTRIDGE:**

Q. **Can we go back to PTX-177, please?**

**Kelly, can we get to Page D-16?**

**That is it.**

**You were asked some questions about this GE refrigerator. Do you recall that?**

A. **Yes, I do.**

Q. **Looking at the refrigerator that is in Figure 18, I am just going to mention a couple of things. Does it appear to dispense ice outside the door?**

A. **Not that I can tell.**

Q. **Does it have an auger in the ice bucket?**

A. **It doesn't appear to have an auger in the ice bucket, no.**

Q. **I am not going to belabor this, Mr. Myers. Let's turn to Figure 3 of your patent just as an illustration.**

**This is a cross-section of the relevant parts of the invention; is that right?**

A. **Yes, it is.**

Q. **Does this dispense ice through the door?**

A. **It certainly does.**

Q. **Does it include an auger?**

A. **It certainly does include an auger.**

Q. **Among other things?**

A. **Among many other things.**

**MR. PARTRIDGE: No further questions.**

**THE COURT: Thank you, Mr. Myers. You are excused.**

**MR. PARTRIDGE: Mr. Spears will call our next witness.**

**THE COURT: All right.**

**MR. SPEARS: Whirlpool's next witness will be Mr. Steven Williams.**

**THE COURT: Mr. Partridge, can I see you off the record ?**

**(Sidebar conference with Court and Mr. Partridge not reported.)**

**MR. PARTRIDGE: May I interrupt Mr. Spears?**

**THE COURT: Go right ahead.**

**(Counsel confer.)**

**... Stephen Williams, having been duly sworn as a witness, was examined and testified as follows ...**

**THE COURT: Counsel, hold on just a second.**

**Okay, Mr. Spears.**

**DIRECT EXAMINATION**

**BY MR. SPEARS:**

Q. **Mr. Williams, could you please introduce yourself to the jury?**

A. **Yes. Ladies and gentlemen, my name is Steve Williams.**

Q. **Where do you live, sir?**

A. **I live in Evansville, Indiana, working for the Whirlpool Corporation since September of 1981.**

Q. **Have you ever testified in court before?**

A. **No. This is my first time.**

Q. **I would like Mr. Barnes or Mr. Roberts to put up on the screen the first page of Defendants' Exhibit 5. Maybe the second page.**

**Do you see that this is a copy of United States Patent No. 5,269,601?**

A. **Yes, I do.**

Q. **Do you see a name on sort of the upper left-hand side of that page?**

A. **Yes, Williams, that's my last name.**

Q. **Who is the Williams that is referred to there?**

A. **I am one of the inventors on the '601 patent, Stephen G. Williams.**

Q. **Before talking about the invention in that patent, I would like to talk some about your history with the company.**

**What year did you hire into Whirlpool?**

A. **I hired in 1981.**

Q. **What did you do for the company at that time?**

A. **I was -- at the time I was about three years out of school, of college. And I was hired in to work on manufacturing controls. A pretty exciting project that was underway at Whirlpool in Evansville at the time had to deal with a huge piece of equipment which injects the foam into our refrigerator cabinets, and they needed someone to help do the controls for that project.**

**They had to do a lot of photo sells, a lot of trafficking of our cabinets in and out of the system, and some huge foaming carousel fixtures that would basically take those cabinets in and inject the foam, fixture them, and then bring them around and traffic them back out of the system to our manufacturing lines.**

Q. **You mentioned getting out of school. Do you have a degree in engineering, sir?**

A. **Yes. I have an electrical engineering degree from the University of Evansville.**

Q. **When Whirlpool presented you with this manufacturing issue to address, how useful did you find your course work in solving these problems?**

A. **Well, you know, the course work provided a good foundation for engineering knowledge, but the actual reducing to practice and doing actual projects in the manufacturing environment, you know, you kind of learn as**

**you go there and rely on other experts and other engineers around me as well.**

Q. **How long did you work on manufacturing issues for Whirlpool?**

A. **I worked in that group until 1983.**

Q. **Where did you go in 1983?**

A. **In '83 I went to our laboratory, where we -- also in the Evansville area there, in the same location as the factory, working on test equipment for monitoring our products, you know, controlling chambers that -- we have chambers that control temperature that we test our products in, as well as the performance of that product and how well it cools under various conditions and ambient conditions.**

**I designed equipment to take temperature measurements and also control the ambience.**

Q. **How long did you do this sort of work?**

A. **Till 1987.**

Q. **What did you do next for the company?**

A. **In 1987, I wanted to continue to grow my experience, so I moved into a role working on quality improvement projects that had to deal with our side-by-side refrigerator line, which was produced in Fort Smith, Arkansas.**

Q. **What were the most noteworthy quality improvement issues that you personally addressed during this time?**

A. **Several smaller projects that I worked on. But the**

**one that had to do with the cabinet bowing was the most significant project that I was involved in.**

Q. **We will talk about that a bit later on.**

**For how long were your tasks devoted to quality improvement at Whirlpool products?**

A. **In 19 -- around 1991 I moved into a role actually designing features for that same side-to-side refrigerator. So it was more of a design role at that point in time.**

Q. **What project specifically was confronting Whirlpool in 1991 when you moved to this design function?**

A. **In 1991 the U.S. Department of Energy had issued some new energy requirements for refrigerators that were going to take effect on January 1st of 1993.**

**So I was on the team that was going to -- we were redesigning certain aspects of the side-by-side refrigerator to meet that standard.**

Q. **Was this an important project to the company?**

A. **Yes. In order to continue to sell refrigerators, on January 1st of that year, we had to be compliant with the standard.**

Q. **And did you personally contribute ideas to improve the energy efficiency of Whirlpool refrigerators so they would meet that standard?**

A. **Yes. My role on the project was to do controls and product wiring. And also, you know, related to that, on the**

**refrigerator, the side-by-side, you will note there is a vertical rail that separates the two compartments. And prior to that redesigning, that vertical rail, it's somewhat cool, and then there is condensation that forms on that rail. And prior to 1993 we used an electric heater that consumes energy, of course, to drive off that moisture to keep it from sweating and water dripping onto the customer's foot.**

**So my role was to redesign that center rail so that we could accept one of the hot gas loops from our condenser, something that normally is operating in our refrigerator -- or in any refrigerator, and that loop, we redesigned the rail so it would accept part of that loop so that it could run the length of that center rail, and, of course, the warmth of that loop would drive off the condensation without having to use electric heat.**

Q. **I would like to sort of move off of these energy efficiency issues and talk some about the bowing that you had mentioned earlier in your testimony.**

**What I would like for you to do is to explain what bowing is generally and what quality improvement issues this bowing raised for yourself and for Whirlpool.**

A. **Your Honor, would it be okay if I stepped over to that refrigerator?**

**THE COURT: Yes, sir.**

(Witness steps down from stand.)

BY MR. SPEARS:

Q. You are going to have to speak up, Mr. Williams. And there is no microphone there and it's kind of a long distance between there and the jury.

THE COURT: We will put a microphone on him.

BY MR. SPEARS:

Q. Do you remember the question, Mr. Williams?

A. Yes, I think so.

Q. Before you start --

THE COURT: Mr. Spears, I don't remember the question. I don't know if the jury does. It's good that you two do.

MR. SPEARS: I will do my best to repeat it.

BY MR. SPEARS:

Q. The question, Mr. Williams, was whether you could just generally explain what bowing is and how this bowing raised quality improvement issues for yourself and for the company. And you are standing in front of a refrigerator right now. Before you get into your answer, I would like to make it clear for the record what that exhibit tag says on that refrigerator.

A. Yes. It's "DPX026."

Q. Now, would you please proceed with your answer, sir?

A. First I need to explain a little bit about the

structure so that we can understand what elements affect the bow.

The structure of the cabinet on this outside wall is steel. And then, when I open the door, you have the inside liner, which is plastic. And then in between there we have our foam insulation. So it produces a very -- a pretty rigid structure.

With this long piece of plastic here, from top to bottom, and the temperature differential between the outside of the cabinet and the inside, and the difference in the expansion and contraction of these two materials, this plastic, under freezer temperatures, begins to contract quite a bit. When it does, it forces this wall to move outward and bow in this direction (indicating).

Q. So that moving outward, that is the bowing?

A. Yes.

Q. What problems did that bowing possess?

A. Well, there are several things that we encountered.

These shelving units that are mounted to supports between the two walls and our baskets, as that wall begins to move, the engagement on those supports gets smaller and smaller. And we would actually have shelves that would fall and baskets that would fall. And, of course, all the food would end up in the bottom of the refrigerator.

Q. **What were some other problems?**

A. **In this product here, it's a newer product, this light switch up here is located in the top. Back in that time, the light switch was actually on this wall here (indicating).**

Q. **For the record, where are you pointing?**

A. **At the center of the outside wall of the compartment.**

Q. **Please continue.**

A. **And so as that wall begins to move, with this door closed, the compartment cools down, the wall moves -- the wall moves that switch away from this surface here on the door. And it actually turns the light on even though the door is closed.**

**With that light coming on, the extra heat load, the product warms up inside, and then it begins to come back in, the bow reduces, the light goes off, and it cycles on and off like that inside. And then, of course, the frozen food doesn't do very well in those environments.**

Q. **Are there any other problems that bowing causes?**

A. **One other issue had to do with energy. This wall would bow to such an extent that the door gasket that seals on the steel would lose contact and then warm, moist air would get into the compartment and cause us to consume more energy.**

Q. **If I had my refrigerator in a tight space in my**

**kitchen, could the bowing possess other problems?**

A. **Yes. There are locations -- and we receive quality complaints. When a person installs a refrigerator in their house, it's warm. And a lot of times there is a countertop right next to it. Then there is possibly a wall on this side in a lot of installations.**

**So when the product is plugged in, it cools down, this wall bows to the extent that it basically locks the product in that location and the customer can't pull it out, can't clean under it.**

Q. **Mr. Williams, you can resume your seat. Please give the Court back his microphone before you do so.**

**(Witness resumes stand.)**

**BY MR. SPEARS:**

Q. **Mr. Williams, how did Whirlpool come to recognize that it had a problem with bowing in its refrigerators?**

A. **Well, we have a call center that takes customer complaints. So the customer would call into our call center and register complaints. And then we have a team of people who analyze those complaints, and then we spend engineering resources and dollars to address the top issues.**

Q. **So if enough customers call and complain about something, Whirlpool will assemble a team to address the problem?**

A. **Yes, that's true.**

Q. **And who did Whirlpool assign to solve this problem?**

A. **I was assigned to solve the problem from the design side located in Evansville, Indiana. Then my colleague, Mr. David Schwartz, was assigned to coordinate the activity in the manufacturing plant in Fort Smith, Arkansas.**

Q. **Before you and Mr. Schwartz were given this mission to solve the bowing problem, had Whirlpool played around with other potential solutions to the problems raised by bowing?**

A. **Yes. There was some action to redesign the support system, to give them more engagement to the tracks that the baskets would ride in, as well as the wall supports. They tried to link them inasmuch as possible.**

Q. **How did that work out?**

A. **They couldn't do it to the extent that would keep the baskets and shelves from falling, because, as you might imagine, on the assembly line, when the product is warm, there is no bowing.**

**So there is only -- you have got to have so much tolerance to install a shelf or basket or it's going to interfere with the support system, you can't get in.**

Q. **Just generally, what solution did you and Mr. Schwartz come up with for this bowing problem?**

A. **That's where the plaque liner solution comes in.**

**MR. SPEARS: May I approach the witness, Your Honor?**

**THE COURT: Yes, you may. You have free leave to do that, counsel.**

**MR. SPEARS: Thank you.**

**BY MR. SPEARS:**

Q. **I am handing you what has been marked as Williams Demonstrative Exhibit 1, this brick-like-looking thing. Can you explain to the jury what that is?**

A. **This is a section of that wall I was showing earlier in the refrigerator cabinet, the freezer wall. We have the steel here, this foam material between, and then the plastic liner on the inside.**

Q. **Those two indentations in the white plastic surface, what are those?**

A. **These are the plaques in the liner.**

Q. **What effect did you intend those plaques would have on the behavior of that wall structure?**

A. **Well, as I mentioned earlier, this wall was a flat surface. It's a very long, flat surface. We realized that in order to break up the planar surface that the forces are acting in, we broke it up into various multiple planes by plaquing and offsetting the liner in various locations into the foam.**

**In doing that, now we were able to take those forces and take them across multiple layers, multiple surfaces, here and here and here (indicating), such that now**

these edges around these plaques begin to act as expansion joints and allow it to move and allow the liner to move without bowing, without as much bowing.

Q. Did you and your co-inventor do any test to determine whether those indentations, or plaques, in fact, functioned as expansion joints?

A. Yes. We actually tested products in our laboratory in Evansville.

Q. A black notebook has been placed in front of you. And behind tab 2 we have placed a copy of your '601 patent. I would like to direct your attention to Table 1 in that patent, which appears in Column 5, I believe.

A. Okay, yes.

Q. Can you explain the information in that table?

A. Yes. We actually tested an unplaqued liner in a refrigerator and a plaqued liner. And in that testing, we had a direct comparison between plaques and unplaques. And basically, the data shows you that, comparatively speaking, between those two products, we had almost an 80 percent improvement in the deflection of the plaqued one versus the unplaqued.

Q. Under the heading "Sample Configuration," there is a reference to "HIPS." What is that?

A. That is the plastic liner. It's high-impact polystyrene.

Q. **Next I would like to have Table 2 from this patent put up, which appears near the top of Column 6.**

**Can you tell us what information is provided in Table 2?**

A. **Yes. This is a finite element analysis. That work was done by one of our analysts, comparing an unplaqued liner to a plaqued liner with a plaque that was offset into the foam by a 16th of an inch, and then another one that is offset into the foam by an 8th of an inch. And then various percent decrease in bow, with almost 15 percent for the 16th of an inch and then almost 18 percent for the quarter of an inch.**

Q. **Now, you mentioned finite element analysis. Is that a technique that involves applying actual measuring instruments, like rulers or pressure gauges, to real refrigerators?**

A. **No. That is a mathematical tool. It is a software package run on computers. It allows us to model different configurations without actually having to make a product. Obviously, it costs us quite a bit of money to make samples to actually test. So this helps us get to a design that will allow us to do our testing without spending a lot of engineering resources.**

Q. **What, if anything, did this mathematical model predict about the prevention of bowing in wall liners for the**

**plaques that you had designed?**

A. **Well, this model, again, you know, as you look at the data, the projection is that if we use a plaque with one of these depths here, we should see an 18 -- almost 18 percent improvement in the amount of bow over an unplaqued version of that same product.**

Q. **Now, I am sure that mathematical models are very interesting to engineers like yourself, but how much bowing did your plaques actually prevent in real refrigerators?**

A. **We took a design, working with David in Fort Smith, and we made products from the assembly line with the plaque configuration, unplaqued and plaqued, and took them to our laboratory in Evansville. And we took -- before measurements, before we plugged the products in and cooled them down, and in comparing the plaqued liner measurements at the top and the middle and the bottom of that inside wall, after having cooled, and comparing them back to the ones prior to actually taking them to freezer temperature, we actually realized a 40 to 50 percent improvement in the plaques over the unplaqued versions.**

Q. **Mr. Williams, can you turn to tab 4 of the notebook in front of you where we placed a copy of Plaintiffs' Trial Exhibit 398? Could you tell us what this document is?**

A. **Yes. This is Whirlpool's invention disclosure sheet that I authored back in February of 1991.**

Q. **Could we turn to the bottom where the signatures appear?**

**If we can get that up on the screen.**

**Whose signature is that, sort of the top one in the block?**

A. **That is my signature.**

Q. **And whose signature appears beneath that?**

A. **That is my co-inventor, Mr. David Schwartz.**

Q. **And around what date did you prepare this document?**

A. **That would have been written on February the 5th, 1991.**

Q. **Now, above that block there is a block labeled "Date of Conception." Do you see that?**

A. **Yes. That's October 1989.**

Q. **And what happened in October of 1989?**

A. **In October of 1989, that would have been the date of conception for the invention of the plaques.**

Q. **Now, this is a document that you personally filled out?**

A. **Yes.**

Q. **What were you thinking at the time that you were preparing this document?**

A. **Well, at that time I was three years out of school, and this was pretty exciting because this was my first opportunity to get a U.S. patent. Among engineers and**

**engineers around me that had patents, I had hoped this would result in one -- you know, my first one as well.**

Q. **I am going to ask you one last question about this document, Mr. Williams. It concerns the information found in the bottom paragraph above the signature blocks.**

**What is that paragraph describing?**

A. **The last part of that is describing the testing that I just mentioned a moment ago, where we actually saw results that reduced the cabinet bow by 40 to 50 percent over a smooth liner, one without plaques.**

Q. **Now, after you and your co-inventor came up with this invention, did Whirlpool place it in any of its refrigerators?**

A. **Yes. Every side-by-side refrigerator that we built since that time, up until the present day, has plaque liners.**

Q. **So was this an easy thing to do? Could Whirlpool just snap its fingers and have that invention magically appear in their refrigerators?**

A. **No. We have numerous thermoforming fixtures that form that plaque liner. I am guessing there might have been 10 or 12 at the time. Of course, you know, you don't want to shut down your manufacturing operations while you make these changes. So the plaques themselves are tooled out of aluminum or steel and then they have to be attached to these**

**thermoforming molds.**

**So there is a significant amount of tooling that has to be taking place, as well as resources to attach those, take the molds in and out of the machines that form the liners.**

**So there is a significant amount of resources that were spent to make the change-over.**

Q. **Mr. Williams, if someone were to walk up to you and say, those plaques in Whirlpool's refrigerators, I don't think they prevent bowing, what would you have to say to that?**

A. **I would say, you are wrong.**

Q. **Why is that?**

A. **Well, you know, I have tested it, I have seen it personally. It works.**

Q. **How much bowing did the plaques prevent?**

A. **We are in the neighborhood of 40 to 50 percent.**

Q. **Insofar as you know, are the shelves staying put now?**

A. **Yes.**

Q. **Are the gaskets engaging the wall?**

A. **Yes. Those things are solved.**

Q. **And you have prevented enough bowing to solve those problems?**

A. **Yes, absolutely.**

Q. **Now, if someone were to walk up to you and say, those**

**plaques in the interior of Whirlpool's refrigerators, I think they are there for aesthetic reasons, how would you respond to that?**

A. **Marketing -- marketing told me they were ugly. And they argued about putting them in there, but they understood the issue that we were solving was three or four significant quality issues. So it was costing the company a lot of money to address that from a service incident rate.**

**So they were willing to make that sacrifice.**

Q. **So who won the argument between Whirlpool's marketers and Whirlpool's quality improvement engineers?**

A. **Well, I would like to say -- obviously, the customer wins here, but, yeah, our quality improvement engineers won that battle.**

**MR. SPEARS: Thank you, Mr. Williams. Pass the witness.**

**THE COURT: All right. Mr. Davis, are you cross-examining on this?**

**MR. DAVIS: Yes, Your Honor.**

**CROSS-EXAMINATION**

**BY MR. DAVIS:**

Q. **Good afternoon, Mr. Williams. My name is Walter Davis. I have not yet had the chance to meet you. I was looking for you in the hallway during our break earlier and I didn't see you.**

A. **Good afternoon.**

Q. **I just have a few questions for you today.**

**You did not invent the concept of placing indentations in a plastic liner in a refrigerator cabinet, correct?**

A. **No. There has been indentations in liners previously, sure.**

Q. **Were you the first to put indentations in liners in order to compensate for thermal bowing?**

A. **Yes, I believe.**

Q. **You would agree that if there were an indentation in a plastic liner before the date of your invention that compensated for thermal bowing, then you would not be entitled to an invention?**

A. **Yes. If it had been invented before, that would be true.**

Q. **Let me turn you to -- I believe you have the cross notebook. I think it's the second tab. It should be PTX-16.**

**If I could have that up.**

**Do you recognize PTX-16? Let me help you out. It's the file wrapper to your patent, the '601 patent.**

A. **Okay.**

Q. **Do you see that information there right on the front?**

A. **Yes.**

Q. **Now, I believe, hopefully, I am a little more successful than my colleague was earlier at having these pages numbered. But if you look down in the bottom right-hand corner --**

A. **Okay.**

Q. **-- and turn to page 111.**

A. **Yes.**

Q. **Do you recognize this patent?**

A. **Yes. This is one of the patents identified in the prior -- I guess in the prior art, or the U.S. patent documents that was identified in the '601 patent.**

Q. **That is correct. Let's take a closer look at it, if you will.**

A. **Okay.**

Q. **First off, it's patented February 12th, 1985, right?**

A. **Yes.**

Q. **And that means that, essentially, it's dedicated to the public, because it's more than 17 years from that date. Do you understand that?**

A. **Okay, yes.**

Q. **And you notice, actually, that even the owner of this patent is Whirlpool?**

A. **Yes.**

Q. **And the date of this patent is more than seven years, I believe, before you filed for a patent on the '601 patent.**

**Right?**

A. **That's right.**

Q. **Mr. Brooks, if we could go to Column 3 of this patent, please. I think it's going to be lines 59 through 63.**

**Now, these lines describe a rib which is in the form of a trough, correct? If you can just follow the screen.**

A. **Okay.**

Q. **And the trough in the liner is actually an indentation in the liner. If we could go to figures 3 and 4, I believe this will help my explanation. Are you with me?**

A. **Yes.**

Q. **So the trough is an indentation, correct?**

A. **Yes.**

Q. **So if you could go back to Column 3, please, Dave?**

**If we look towards the bottom here, line 67, and then through Column 4, line 4, here it reads : "The tapering of the side walls 68 and 70 enhances stress relief. As best seen in FIG. 4, the taper of side wall 70 is longer, or more gradual, than that of side wall 68 so as to facilitate relative downward movement of liner wall 30 during thermal contraction."**

**Would you agree that that is an indentation that compensates for thermal bowing?**

A. **No. You know, it compensates for the thermal**

**contraction that was occurring in that particular invention.**

Q. **It compensates for some sort of thermal stress, right?**

A. **Yeah, okay.**

Q. **If we could go to, I believe it's going to be Claim 1, the preamble area there. If we could just read this preamble quickly.**

**It discusses a plastic cabinet liner within a cabinet in defining a refrigerator space with a liner including a generally planar wall, and insulation disposed between said liner and said cabinet and having a coefficient of thermal expansion different from that of said liner, and thermal stress relief means to fix that.**

**Isn't that what you described before with respect to bowing?**

A. **Yes. Bowing is described in what I described before, yes.**

Q. **So you then would agree that the indentation or trough in this patent is there to compensate for thermal bowing?**

A. **No, not actually. It could be, you know -- if I speculated, I would say it probably has some effect. But I would actually like to do some testing on it to know for sure.**

**Reading further in this particular document, this particular solution was to prevent cracking of the plastic surface.**

Q. **I believe, actually, if we go back to Column 3. Further up. Could you zoom up? Starting at line 11?**

**As you suggested, there is some measurement of relief from cracking here. But if we read, to prevent such thermal stresses from causing cracking or other damage to the liner. Do you see that?**

A. **Yes.**

Q. **I am going to move on right now.**

**Let's turn to Claim 1 of your patent. I believe that Mr. Spears used your patent as one of your exhibits. It is going to be DX5. If you could pull that up, Dave.**

**The portion I am interested in is line 55.**

A. **What column, sir?**

Q. **It's going to be towards the end of the patent, the claims section, specifically, Column 7. I apologize for that.**

A. **Okay. Got it.**

Q. **So do you recall discussing expansion joints during your direct examination?**

A. **Yes.**

Q. **And these are the expansion joints you were discussing, correct?**

A. **Yes.**

Q. **And these expansion joints, essentially they are edge portions that are capable of flexure to absorb thermally**

**induced contraction and expansion of the interior plastic layer. Right?**

A. **Right.**

Q. **On direct you testified that you actually performed testing to confirm this expansion joint phenomenon; is that correct?**

A. **Yes. To the extent that I actually measured the bowing of the compartment itself. Not the actual edge movement, but the bowing that was realized inside the compartment.**

Q. **I see. So you did not test for expansion joints?**

A. **No. Our test didn't look at the movement of the actual joint. That was determined in our finite element analysis.**

Q. **I thank you for that clarification.**

**Speaking of finite element analysis, did you actually see any results of that analysis?**

A. **In my -- yes, I did.**

Q. **You did?**

A. **Yes, I actually worked with our finite element analyst who was in our research and engineering group in our corporate headquarters in Michigan.**

Q. **When did you see that analysis?**

A. **Well, actually, I worked with him over the telephone at the time between the 1989 and 1993 date.**

Q. **Okay. Do you recall you had a deposition in this case?**

A. **Yes, I do.**

Q. **Do you recall that you were under oath when you gave that deposition?**

A. **Yes, I do.**

**MR. DAVIS: Your Honor, if I may, I am going to approach the witness and hand him a transcript so he can follow along.**

**THE COURT: You may do that.**

**BY MR. DAVIS:**

Q. **I am at page 15, lines 2 through 9. Let me know when you are there, Mr. Williams -- 14, I am sorry, lines 2 through 9.**

A. **Yes.**

**MR. DAVIS: If you could play that, please.**

**"Question: Okay. So you believe that there was finite element analysis that demonstrated that those edges actually flexed?**

**"Answer: Yes.**

**"Question: Or that -- okay. Did you see that?**

**"Answer: No.**

**"Question: You never saw it?**

**"Answer: I never saw the analysis."**

**BY MR. DAVIS:**

Q. **In fact, your co-inventor was the sole source of your knowledge that testing was actually done to determine whether or not edge portions flexed. Correct?**

A. **Are you speaking about the finite element analysis?**

Q. **I am speaking about any analysis done to determine whether or not the edge portions flexed in the manner we have been discussing.**

A. **Well, the testing that was done on actual products was in our laboratory in Evansville. And I followed that.**

Q. **You followed that.**

A. **On the actual products that we manufactured.**

Q. **Didn't you testify earlier that you did not perform tests to determine whether or not there is this expansion joint feature?**

A. **Oh, not the actual joint.**

Q. **That's what I am speaking of, sir.**

A. **Okay.**

Q. **Okay. So your co-inventor was the sole source of your knowledge that expansion joints worked in the manner described in Claim 1, correct?**

A. **That's what I had indicated in my deposition. But after -- it's been a long time. It's been 20 years since I have revisited this. So something about this troubled me. And I went to -- went back to my colleagues in Evansville and spoke to an engineer I worked with located in**

**Evansville. And he reminded me that Mr. Samersian, who did the analysis, was actually located in our research and engineering group. Of course, you know, some of the cobwebs began to disappear. And I actually do remember now working with him over the phone to get various analyses done that supported the data that we show in the '601 patent.**

Q. **Do you understand that after you have your deposition taken, you have the opportunity to fix any errors in your transcript?**

A. **Yes. And I did look at it. But it was, you know -- at the time we had a lot of projects going on. And at that time I didn't catch that mistake.**

Q. **So you confirm that you did, indeed, fill out an errata sheet and that there were no errors?**

A. **Yes, I did fill out a sheet.**

Q. **Thank you.**

**Mr. Williams, I have no further questions for you.**

**THE COURT: Mr. Spears, redirect?**

**MR. SPEARS: No further questions, Your Honor.**

**THE COURT: Thank you, sir. You are excused.**

**(Witness excused.)**

**THE COURT: Rather than start another witness at this point, ladies and gentlemen, we will take our lunch break now. We will resume at -- take your time. We will**

**resume at 2:00.**

**(Jury leaves courtroom at 12:48 p.m.)**

**THE COURT: Counsel, I just want to mention something that I mentioned in passing as you saw to Mr. Partridge and Mr. Sharma. I would like you all to follow his example. When you are referring to individuals other than lawyers who are involved in this process, I am rather formal, so I am going to insist that everybody's sur name be used. It's Mr., Ms., Mrs., not Dave, Kelly, okay?**

**Thank you.**

**(Luncheon recess taken.)**

**THE COURT: All right. Ms. Walker.**

**Counsel, we are going to get a later start tomorrow. I have a Judges' meeting. So we are going to start at 9:30 tomorrow. At the end of the day, I am going to want to get a sense from you as to how you are progressing in your discussions about the final jury instructions and the verdict form.**

**(Jury enters courtroom 2:01 p.m.)**

**THE COURT: All right, ladies and gentlemen. We are going to continue. Please take your seats.**

**Counsel.**

**MR. SPEARS: Your Honor, Whirlpool's next witness is Dr. Robert Caligiuri. I would like to make a brief transition statement.**

**The witness you are about to hear from is an expert on mechanical engineering. He is a gentleman who has taken a look at Whirlpool's '601 and '130 patents, among other things. And in the testimony he is about to give, he will take the LG refrigerators that Whirlpool is accusing of infringement and compare them to the claims of Whirlpool's '130 and '601 patents.**

**THE COURT: Okay.**

**... Robert Caligiuri, having been duly sworn as a witness, was examined and testified as follows ...**

**THE COURT: Mr. Spears, you may inquire.**

**DIRECT EXAMINATION**

**BY MR. SPEARS:**

Q. **Could you please state your full name?**

A. **Robert D. Caligiuri.**

Q. **Where do you live, Dr. Caligiuri?**

A. **I live in Menlo Park, California.**

Q. **What do you do for a living?**

A. **I am a vice president and principal engineer of a company called Exponent, which is an engineering and scientific consulting company.**

Q. **What types of services does Exponent provide?**

A. **We provide consulting services, which are professional services, to corporations, to governments, insurance organizations, helping them solve a variety of technical**

**problems, both on the engineering side, as well as on the science side.**

**We have about 90-plus technical disciplines in our company.**

Q. **Could you tell us about your formal education?**

A. **I have an undergraduate degree in mechanical engineering from the University of California at Davis. And I have a Master's and Ph.D. degree in material science and engineering from Stanford University.**

Q. **In what year did you get your Doctorate from Stanford?**

A. **It was a long time ago. 1977.**

Q. **What did you do after you got that degree?**

A. **Went to work at the Lawrence Livermore National Laboratory, which at the time was one of the two nuclear weapons design centers in the United States.**

Q. **Can you tell us about some of the more interesting projects that you worked on at Lawrence Livermore?**

A. **A lot of my work related to structural integrity, mechanically engineering, materials engineering of components that go into nuclear weapons, the casings, some of the internal structural components. But actually one of the most interesting projects I worked on there was one I got involved in about six months after I arrived at the lab.**

**In January 1978 a Soviet satellite fell down in northern Canada, and I was part of a team that was up there**

looking for pieces of this satellite, spy satellite. And I was looking for structural components. I spent three months in the frozen tundra of Canada.

Q. How long did you spend with Lawrence Livermore?

A. About two years.

Q. What did you do after that?

A. I went to an organization called Stanford Research Institute, now known as SRI International. At the time it was still part of Stanford University. It's an organization that conducts research and development studies on a contract basis for industry, trade associations, and for the government.

Q. Did you do anything interesting at SRI?

A. People wonder if engineers do anything interesting, I suppose.

At SRI I worked on a wide range of projects related to the integrity, mechanical and structural integrity of nuclear power plant components, boiling water and pressurized water reactors. I worked on developing advanced armor systems and penetrator systems for combat vehicles, some of which are in use today in Iraq and Afghanistan.

And I worked on a variety of infrastructure projects related to the degradation of our bridges, highways, pipeline systems, power transmission systems.

Q. **Dr. Caligiuri, do you hold any professional licenses?**

A. **I am a licensed professional engineer in the states of California and Utah.**

Q. **Are you a member of any professional organizations?**

A. **I am a member of several. I am a fellow of the American Society of Materials. And I am a member of the American Society of Mechanical Engineers.**

Q. **When did you begin work with Exponent?**

A. **In 1987.**

Q. **What was your first project at Exponent?**

A. **Well, interestingly enough, the Challenger, the Shuttle Challenger, had destroyed itself on launch in 1986, I believe. And the company at the time called Failure Analysis Associates was involved in evaluating one particular scenario relating to the failure of the shuttle.**

**That had to do with the failure of the O rings around the solid rocket motor nozzles. And I was involved in analyzing the reasons why that O ring structure had failed.**

Q. **Dr. Caligiuri, you do understand that this case is not about atom bombs or satellites or spacecraft. It's about refrigerators, right?**

A. **Yes, sir.**

Q. **Why don't you tell us about the sort of projects that you have worked on that relate to refrigeration and consumer**

**appliances.**

A. **I have been involved in projects related to refrigeration, kitchen appliances, home appliances, consumer electronics since about 1992. Particularly in refrigeration components, starting in about early 1993.**

**These projects as focused on refrigeration relate a lot to the sealed system, the compressor system, the evaporator, condenser, the piping that goes between them, the mechanisms and how they work. I also did a number of projects on refrigeration, the design and development of refrigeration.**

**Particularly as the industry moved from classic R12-type refrigerants to R134A and ultimately to some flammable refrigerants that are currently used in Europe. And I was intimately involved in the design and development process as a consultant, particularly doing failure modes and effects analysis.**

Q. **What sorts of analyses have you done on refrigerators?**

A. **Material studies, mechanical studies, integrity studies, failure modes, and effects analyses and stress analyses.**

**I also was involved in the review of -- I think you heard Mr. Myers this morning talk about the C2C process. I was part of a team that helped Whirlpool globalize that process around all of its facilities around the world. So**

**mechanical testing, materials testing, failure modes, and effects analyses, failure analysis, and design assistance designing systems.**

Q. **Have you done any work on structural integrity issues like the one Mr. Williams was talking about before we broke for lunch?**

A. **Well, I haven't -- until this matter came up, I hadn't worked on refrigerator wall bowing. But certainly I have worked on a number of projects related to structural integrity, which is what the ultimate -- this ultimate issue is about, the integrity and structural deformation of the wall.**

**And I have worked on many, many projects related to structural integrity.**

Q. **What sort of mechanical testing have you performed or supervised in connection with those projects?**

A. **When you are evaluating the structural integrity of a component, a system, you generally -- whether it's to sort of prevent a failure in the system or try to minimize the chances of failure in a system or to try to figure out why something happened in a system so it doesn't happen again, hopefully, you do a lot of evaluations on the component.**

**That evaluation can consist of mechanical testing, tensile testing, torsion testing, compression testing, chemical testing, microscopic examination. A range**

**of things that you test in the laboratory to evaluate the key components and properties of the materials that are used in the structure.**

Q. **Are these all the sorts of tests that you personally have performed or supervised?**

A. **Absolutely.**

Q. **In addition to these types of tests that you have just described, are there other methods that you have applied in analyzing structural integrity issues?**

A. **Well, the structures in the engineering world are often quite complex, including even the refrigerators here in the courtroom. It's often difficult to completely analyze a structure just using laboratory testing or small sample testing. The issue then becomes what is the behavior of the entire structure, which you can test, certainly, but it becomes very hard and complicated. I think Mr. Williams made reference to that this morning.**

**So there have been tools developed since the 1960s to assist engineers in this design, or this review process, structural integrity process, involving computational methods. The finite element method is one that Mr. Williams mentioned this morning. It is a tool I have used as part of a structural integrity assessment to put together all the laboratory testing that you have done, to evaluate the integrity of a component or structure from a**

**global perspective.**

Q. **Thank you, sir.**

**MR. SPEARS: Whirlpool offers Dr. Caligiuri as an expert in the field of mechanical engineering.**

**MR. COYNE: No objection, Your Honor.**

**THE COURT: Absolutely. Yes, the Doctor is accepted as such.**

**BY MR. SPEARS:**

Q. **Could we have the '130 patent, Defendants' Exhibit 8, placed on the screen?**

**Dr. Caligiuri, have you come to opinions in this case regarding whether certain LG refrigerator products infringe claims of this patent?**

A. **I have, indeed.**

Q. **What information forms the basis of your opinions on these issues?**

A. **Certainly a detailed review of the patent; in particular, the claims in the patent, a detailed examination of the prosecution history of the patent, and a review of the claims constructions that have been issued by the Court in this matter.**

Q. **Have you looked at the products themselves?**

A. **I inspected the product themselves, of course, absolutely, and compared them to the claims in the patent.**

Q. **Did you have to perform any tests or experiments on**

these products in order to determine if they infringed this '130 patent?

A. I did some testing in the sense of evaluating the functionality of the components and tested the ice maker, tested the storage bins, turned the augers, see where the ice goes, things like that. Tested the overall functioning.

In terms of laboratory testing or the mechanical testing I talked about a little earlier, there wasn't any need to do that in the context of the '130 patent because the patent is really about the positioning and organizational components, not the details of the components themselves.

Q. If we could put up Column 2 of the patent, around lines 10 through 25.

I would like for you to talk generally about the main objectives of the invention described in that '130 patent.

A. Well, as I read the patent, and, of course, as I listened to Mr. Myers this morning, it's clear that the overall objectives of this patent, what they are. But the primary one was the ability to increase the accessible storage space inside the freezer compartment. That seemed to be a major driver for this ultimate invention, driven by clearly identified customer needs.

Q. What are the other main objectives of this invention

**that you have identified?**

A. **Well, again, as I review the patent and listen to the inventors, it appears to be the issue of being able to see the amount of ice that's in there, in the bin itself, and to actually get the bin out of the freezer section, which is difficult. And I have had that problem myself in my older side-by-side refrigerator.**

Q. **How is it that the invention of the '130 patent improves space utilization in the freezer?**

A. **Well, as you read the patent and read the documents, it's clear that that was accomplished through the movement of the storage bin to the door and the movement of the ice-maker unit forward away from its past mounting position in the back of the freezer compartment. That is the primary way in which this additional space was achieved.**

Q. **Dr. Caligiuri, with the Court's permission, I would like to direct you to the two refrigerators that we have marked as Defendants' Physical Exhibits 22 and 23 and have you approach those refrigerators for the next testimony.**

**THE COURT: I am sorry, counsel. I wasn't listening to you.**

**MR. SPEARS: With your permission, I would like for Dr. Caligiuri to approach those two refrigerators.**

**THE COURT: Indeed.**

**MR. SPEARS: We will also mike you up.**

**THE WITNESS: Great.**

**BY MR. SPEARS:**

Q. **What I would like for you to first do, Dr. Caligiuri, is to tell us what Physical Exhibit 22 and Physical Exhibit 23 are.**

A. **22 and 23 are refrigerators.**

Q. **Who makes them?**

A. **LG.**

Q. **Are these refrigerator models that you have considered in the course of your work in this case?**

A. **They are, indeed.**

Q. **And what is the difference between these two refrigerator models?**

A. **DPX23 is a classic side-by-side model, where the freezer compartment is vertically oriented to the fresh-food compartment.**

**DPX22 is what is called a French-door model, where the fresh-food compartment has two doors. And there is a lower freezer compartment with a pull-out drawer.**

Q. **You were talking some about space utilization advantages described in the '130 patent.**

**Do the two LG refrigerators, Physical Exhibits 22 and 23, take advantage of this same space-saving feature that is described in the patent?**

A. **They do. If we start with the side-by-side model, and**

**we open up the freezer door, in the conventional side-by-side, pre-IDI or pre-space plus system, the ice maker is mounted to the side of the wall, typically, here, in the back freezer compartment. And the ice storage bin sits on the shelf here.**

**What has happened here in this system, as is defined within the '130 patent, the storage bin, which is this, has been moved to the door, and the ice maker has been moved to the door, freeing up this space.**

**So moving the storage bin and the ice maker forward has improved the access, increased the amount of storage space available here.**

Q. **What about the French-door model?**

A. **The same thing, in the sense that in the French-door, with a traditional ice maker, it would be down here in the lower freezer compartment, you mount an ice-maker system in here with a storage bin below it. In this model, the ice storage bin and ice maker are mounted in this upper freezer compartment, mounted on the upper fresh-food door inside this chamber here.**

**So if I open this door, I see the storage bin and the ice maker located in a freezer compartment, second upper freezer compartment, thereby freeing up the space in the lower freezer compartment where you now have more available space to store food and things like that.**

Q. **Now, Dr. Caligiuri, you mentioned as another advantage of the '130 patent issues surrounding the convenience and access to the ice storage bin. Do you also find those advantages in the two LG refrigerators?**

A. **Well, again, if we go back to the side-by-side model, in terms of seeing how much ice is there, you can clearly see it through this transparent plastic part here. I can look right in and see how much ice is in there.**

**Secondarily, I can remove this bin very easily and pour ice into a cooler or something like that, as opposed to having to pull out a drawer from the back of the freezer compartment.**

Q. **You have given the explanation with respect to the side-by-side refrigerator. What about in the French-door?**

A. **It's the same thing in that now I have to open up two double doors. But, again, here is the ice storage bin. I can look right in and see the ice. And very easily I can remove the storage bin and pour ice in a cooler or something like that.**

**So it's the same improvements as identified originally in the '130 patent.**

Q. **You mentioned the claims of the '130 patent. In your opinion, which claims, if any, of that patent are infringed by the two LG refrigerators illustrated by Physical Exhibits 22 and 23?**

A. **Based on my review of the limitations and the claims, I think that these two units infringe on Claims 1, 2, 6, 8, and 9, at least, of the '130 patent.**

Q. **What I would like to do for the next couple of questions is have the claims put up on the screen. We are going to chop them up into little pieces and have you explain where each piece of those claims, as it were, can be found in the two LG refrigerators that you have analyzed.**

**So we have the text of Claim 1 up on the screen. The very first piece we find in that claim is a refrigerator. So I have a very tough question for you, Dr. Caligiuri. Those two boxes, Physical Exhibits 22 and 23, are those, in fact, refrigerators?**

A. **Yes, sir.**

Q. **The next piece of the claim talks about a freezer compartment having an access opening and a closure member for closing the access opening.**

A. **Yes.**

Q. **Now, before talking about the LG refrigerators, do we have to take a look at what Judge Sleet has said about the meaning of that language?**

A. **I think that would be helpful.**

Q. **You may need to return to the witness stand briefly, where you will find your black notebook. I believe that at tab 27 we have placed a copy of the summarized claim**

**construction that, in fact, appears in the last page of the preliminary instructions that have been provided to the jury. So that if they want to read along while you address these issues, they are perfectly free to do so.**

**Have you found that document, Dr. Caligiuri?**

A. **I have, indeed.**

Q. **If you could return to the two LG refrigerators. The first thing that I would like for you to do is to indicate what the Judge has said about the construction of this language up here.**

A. **Based on this document, the Court has construed the term, "a refrigerator, including freezer compartment, having an access opening and a closure member for closing the opening," the part that's up in yellow on the screen. It is construed to mean "a refrigerator, including a section of a refrigerator cabinet, kept at a below-freezing temperature, having an opening that provides access to the interior and a closure member that allows access to the access opening."**

Q. **Keeping in mind what Judge Sleet has said about that language, does the side-by-side refrigerator have that freezer compartment, access opening, and closure member?**

A. **Yes. If we go to the side-by-side model, open up the left-hand door where the freezer compartment is, the access opening has a freezer compartment, kept at below-freezing temperature, it has an access opening for accessing the**

**freezer compartment here, as defined by the -- marking it with my finger. It is kind of hard to get on the record. Basically that rectangular opening that your hands pass through to put things in or take them out.**

**And it has a closure member, which is in this case the freezer door for closing this access opening and allowing the freezer to meet its function of maintaining a temperature in it below freezing point of water.**

Q. **What about the LG French-door model, does it have the closure member, access opening, and freezer compartment?**

A. **Yes. It's a bit more complicated than side-by-side. But it certainly does.**

**If we open up the left-hand door on the French-door, as I discussed earlier, there is an upper freezer compartment. So to access the access opening, not only do you have to open up this bigger door, but you have to open up the little door, smaller door, to access this upper freezer compartment. And the access opening now, with these two doors opened, you get to the access opening, this is this area that I am marking with my finger, which is this rectangular area in which the storage bin resides.**

**To close the access opening, I have to close the inner door and close the big door.**

**That is very important, because how does this freezer compartment work? Well, there is a lower freezer**

**compartment that I mentioned. And there is air -- freezing air is blown up by fans through a ducting system into the cabinet right here. It's very difficult to see from where you're sitting, but there are two ports right here. So the cold air or freezing air is blown up and physically blown into this compartment. You can see the two vents right here.**

**So we make this freezing compartment stay below the freezing point of water. To do that, you have to close the big door so that those ducts mount up and the freezing air can be moved from the lower freezer compartment into the upper freezer compartment.**

Q. **The next language I would like to talk about is "an ice maker being disposed within the freezer compartment for forming ice pieces."**

**Once again, do we have to take a look at what Judge Sleet has said about the construction of this patent?**

A. **I think that would be helpful.**

**The Court has construed the term "being disposed within the freezer compartment" is construed to have its plain and ordinary meaning.**

**I think it's important, there is a note attached to this construction that says, the Court rejects a construction of the term which would not include the elements mounted on the freezer door, which I interpret to**

mean that anything mounted on the freezer door is included or part of the freezer compartment.

Q. With that in mind, does the LG side-by-side product have an ice maker disposed within the freezer compartment?

A. Yes, the side-by-side has an ice maker here mounted on the door which is part of the freezer compartment. So it has an ice maker disposed within the freezer compartment.

Q. What about in the French-door model?

A. The same thing. We open up the closure member here, we can see the ice maker. And the ice maker is mounted to the closure member here. And it is disposed within the freezer compartment, which is the upper freezer compartment. It's disposed within the freezer compartment, mounted to the closure member.

Q. The next piece I would like to talk about is an ice storage bin mounted to the closure member below the ice maker for receiving ice from the ice maker.

Once again, do we have to take a look at what Judge Sleet has said about this language?

A. The Court has construed the term "ice storage bin" to mean any receptacle for storing ice.

Q. With that in mind, does the LG side-by-side refrigerator have an ice storage bin mounted to the closure member below the ice maker?

A. Yes. If you look at the side-by-side model, we

**have -- remember, the closure member here is the left-hand door. And the ice storage bin here is mounted to the closure member. And the ice storage bin is disposed below, located below the ice maker.**

Q. **What about the French-door model, does it have the same structures?**

A. **Yes. If we open up the closure member here, we can see the ice storage bin is mounted to the closure member, and it has an ice maker that is mounted to the closure member. The ice storage bin is located below the ice maker. So it has those elements in it.**

Q. **I would like to skip ahead just a little in the claim to the language -- to the piece that says, "a motor mounted on the closure member."**

**Does the LG side-by-side refrigerator have a motor mounted on the closure member?**

A. **Yes. It's a little hard to see, and to even get an idea of it, I have to remove the storage bin.**

Q. **Please do.**

A. **If you look closely, you can see a metal piece here. This metal piece is a connector. This connector actually mounts into a piece in the back of the storage bin. As the connector turns, it turns this part here.**

**This connector is attached to a drive shaft. There is a motor behind this plastic part right here.**

Q. **Let me interrupt, I am sorry, Dr. Caligiuri. Have you actually removed that plastic part?**

A. **Yes. You can take the screws out and pull the plastic out, and there is a motor back here.**

Q. **You don't have to replace the ice bin, fortunately.**

**What about the French-door refrigerator, does that also have a motor mounted on the closure member?**

A. **Yes, it's the same thing. If you open up the closure member, pull out the ice storage bin, you can see the same component here, right here. You can see the metal connector that is connected to a drive shaft. There is a motor behind this plastic part. And I verified that by taking this plastic part off and there is an electric motor attached to this shaft which drives this connector.**

Q. **Dr. Caligiuri, the rest of my questions surrounding these refrigerators are actually directed to the ice storage bins which, unlike the refrigerators, you can take back with you to the witness box. Could you do that?**

A. **Sure.**

Q. **And you may want to remove your mike in case there are feedback issues.**

A. **I will.**

**(Witness resumes stand.)**

**BY MR. SPEARS:**

Q. **Now, the next language I would like to talk about is**

above the motor piece. It's the piece about the ice storage bin having a bottom opening.

Those two ice storage bins that you removed from Physical Exhibits 23 and 22, do those ice storage bins have a bottom opening?

A. Yes, they do. I am holding in my hand the ice storage bin from the LG side-by-side model, the one on the right, the silver one on the right. It has a bottom opening, which means a hole in the bottom here. I am marking with my finger. It is a rectangular outlet opening in the bottom.

Q. Let me interrupt briefly. Would it be helpful if I gave you my pen for the next couple of questions?

A. Sure.

MR. SPEARS: May I approach, Your Honor?

THE COURT: Yes, you may.

BY MR. SPEARS:

Q. Now, going back again to the bottom opening, could you point out where the bottom opening is in the two bins that we have removed from the refrigerators?

A. Yes, if we turn the side-by-side storage bin on its side right here, you can see the rectangular opening I am marking with Mr. Spears' pen here. It's this rectangular opening here. It is on the bottom of the storage bin.

If I look at the storage bin out of the French-door model, you can see the same basic rectangular

**opening on the bottom of the storage bin.**

Q. **The next piece I would like to look at is "an auger disposed within the ice storage bin and drivingly connected to the motor."**

**In the ice storage bin that you have removed from the two LG refrigerators is there such an auger? And if so, could you point it out?**

A. **Yes. If I look at the ice storage bin from the side-by-side model, if you look inside, you will see a part in here that's a plastic part that is on a metal shaft. That is the auger. So as you turn the connector part I talked about, the auger rotates.**

**And the storage bin from the French-door, if you look inside, you can see the same auger mechanism there, the white plastic part on a metal shaft, that as I turn the connector part, the auger rotates.**

Q. **The last piece of Claim 1 that I would like to talk about is this language about "wherein upon energization of the motor, the auger moves ice pieces from the ice storage bin through the bottom opening for dispensing from the ice storage bin."**

**Does that happen in the two LG ice bins that you have removed from the LG refrigerators?**

A. **Yes. I have actually tested this, as part of my evaluation. If you were to fill this bin with ice and turn**

**the auger, like this, with the motor, ice falls out this bottom hole right here. So it goes in here in the storage bin and the auger then moves it out through the bottom opening.**

**The same thing happens with the French-door. If I turn -- if you put ice in the storage bin and turn the auger, with the motor, ice falls out of the bottom. Pretty obvious.**

Q. **Dr. Caligiuri, I would like to ask you to do something that might sound a little strange. What I would like you to do is to just assume for the sake of argument that in that French-door refrigerator, the double door that you have identified somehow isn't the closure member in Claim 1. I would like you to make that assumption for the next couple of questions.**

A. **All right.**

Q. **Under that assumption, do you have any opinion as to whether that double door would be equivalent to the closure member of Claim 1?**

A. **Well, as I understand it, to be equivalent requires that it do the same function in the same way with the same result.**

Q. **Could you compare the function of the closure member in Claim 1 to what you have identified as the double door in the French-door refrigerator?**

A. **Well, the function of Claim 1 is to have a closure member that closes the access opening. And as I showed, to close the access opening in the French-door takes two doors, but when you close both of those doors, you have closed the access opening. So the function is to close the access opening.**

Q. **Could you compare the way that function is performed as between the closure member of Claim 1 and the double door in Physical Exhibit 22?**

A. **The way it's done is you close the door. You close the inner door. Move it in, latch it, or to open it, or close it, then you close the big door, pushing or pulling on the handle.**

Q. **Could you compare the result of that process as between the closure member of Claim 1 and the double door in Physical Exhibit 22, the LG French-door refrigerator?**

A. **Well, the result is that you would close the access opening when you close both of those double doors, and you allow the freezer compartment, in the case of the French-door, the upper freezer compartment, to meet its function of keeping a chamber below the freezing point of water.**

Q. **I would like to move on to the other claims that you have identified. Fortunately, this next examination should be considerably shorter. Let's begin with Claim 2.**

**Claim 2 requires "an ice discharge chute through the closure member below the bottom opening of the ice storage bin wherein upon energization of the motor, the auger moves ice pieces from the ice storage bin through the bottom opening to the chute."**

**Is there such a structure in the LG side-by-side French-door refrigerators?**

A. **Yes, there are.**

Q. **You may need to approach the refrigerators once again to point out that structure.**

**(Witness steps down from stand.)**

A. **If we open up the freezer door in the side-by-side, it would open, of course, the ice storage bin normally sits right here and the bottom opening rests on top of this flat surface (indicating). And the bottom opening is aligned with this rectangular opening in the structure, which is connected to the discharge chute. So as the ice is moved by the auger out through the bottom opening, it falls into the discharge chute and comes out here where your glass is.**

Q. **What about in the French-door model?**

A. **It's the same thing. We open up the closure member on the French-door model, again, we have the ice storage bin sitting in here. The bottom opening on the ice storage bin aligns with this rectangular cut-out, as you see in the structure. This rectangular cut-out is part of the**

discharge chute. So as ice is moved by the auger out of the bottom opening in the storage bin, it falls through this rectangular opening, into the discharge chute, and out the front.

Q. Could you resume your seat?

(Witness resumes stand.)

BY MR. SPEARS:

Q. While you are getting there, let's put up Claim 6.

The first piece of Claim 6 that I would like to talk about is that the ice storage bin define an ice-crushing region through which all ice pieces must pass when discharged.

Do the LG storage bins have such an ice-crushing region?

A. Yes, they do. If we look at the ice storage bin from the side-by-side model and look in through the bottom opening, you can see an area inside the ice storage bin that has some silver blades in it. This is the ice-crushing region.

The ice must pass through this ice-crushing region. It is moved by the auger, out through the bottom opening, into the discharge chute.

The French-door model, the French-door ice storage bin has the same thing. We look in through the bottom opening, you can see an area here defined by the

**structure of the storage bin, which is the ice-crushing region. If you look inside, you will see some metal blades in there. Those are the blades that crush the ice.**

**So the ice, as it's moved by the auger out through the bottom opening, must pass through this ice-crushing region.**

Q. **The next piece of Claim 6 I would like to talk about is the language about an auger having a shaft portion passing through the ice-crushing region.**

**Is there such an auger in the LG bins?**

A. **Well, I have already pointed out the auger in these ice storage bins. The auger, the shaft part of the auger passes through the ice-crushing region because that's where these blades are attached. So the auger actually passes through. And it is connected to the connector part here. So the shaft goes through the ice-crushing region on both the side-by-side, as well as the French-door. You can see the shaft of the augers passing through the ice-crushing region on its way to the connector part.**

Q. **The next piece I would like to look at is the language in Claim 6 defining "at least one ice crusher blade rotatably connected to the shaft portion for rotation within the ice crushing region."**

**Is there such an ice-crusher blade in the LG storage bins from Physical Exhibits 22 and 23?**

A. **Yes. If you look again through the bottom opening, this is the side-by-side storage bin. As I turn the auger, you will see that there are blades rotating there. Actually, there are three of them in there rotating.**

**So there are rotating blades attached to the shaft of the auger in the side-by-side, as well as the French-door. As I rotate the auger, you can see the blades turning. And there are three blades that turn.**

Q. **The final piece of Claim 6 talks about "at least one stationary blade mounted within the ice crushing region such that the ice crusher blade rotates past the stationary blade."**

**Is there one or more stationary blades in the LG storage bins?**

A. **Yes. If we look at the side-by-side, if you look inside, you see two stationary blades which are differentiated from the rotating blades, as I turn the auger shaft. As the rotating blades pass by the stationary blades, that is the crushing action.**

Q. **The last that I would like for us to put up is Claim 9. I am sorry, I meant the other Claim 8, not Claim 9.**

**Have you also compared Claim 8 to the LG refrigerators?**

A. **Yes, I have.**

Q. **What have you concluded?**

A. **Well, Claim 8 basically has everything in Claim 6, except it defines an upper and lower bin member.**

**So everything is already there, as I demonstrated. The difference now is the upper and lower bin members.**

**If you look at the side-by-side model, you can see an upper bin member as defined by this transparent part that is sitting on top of the lower bin member, which is the white part. So there is the upper bin member and a lower bin member.**

**We have the same situation in the French-door. It's a little different shape. But you have the upper bin member, defined by the clear plastic part here, sitting on top of an edge defined by the lower bin member.**

**In both cases the entire component is the storage bin.**

Q. **Now let's go to Claim 9. Claim 9 has this language that "the ice storage bin is removable from the freezer compartment closure member."**

**So we started off this analysis of the claims with a tough question and we are going to end with another tough question. The ice storage bins that you have been talking about, are they removable?**

A. **Yes, they are easily removable, as I demonstrated over there on the units.**

Q. **What I would like you to do next is to go to tab 4 in the notebook in front of you, where we placed Caligiuri Demonstrative Exhibits 100 through 116. I would like for you to briefly summarize what those exhibits are.**

A. **These exhibits are documents that I created, which is my infringement analysis of Claims 1, 2, 6, 8, and 9 where I go through and do essentially what I just did here in front of everybody, component, component, component by component, limitation by limitation, and looking at photographs, comparing it to the language that is in the claims.**

**So these exhibits, 101 through 116, is the result of my infringement analysis, or summarizes basically what I talked about here.**

Q. **So the same components you identify in those exhibits are the same components you identified in your oral testimony now?**

A. **Yes, sir.**

Q. **Okay. In your opinion, are these two refrigerators in the courtroom the only LG models that infringe the '130 patent?**

A. **No, I don't think so.**

Q. **Could you turn to tab 3 in your binder, where we have placed a copy of Defendants' Exhibit 815?**

A. **Yes, I am there.**

Q. **I believe I want to take you to page 104 in the**

**exhibit that is attached at the end of that document.?**

A. **Okay.**

Q. **What do you understand this to be?**

A. **Well, I understand this document to be basically an agreement between LG and Whirlpool as to what LG models have what features in it, particularly focusing on features related to the '130 patent and another patent. And one of the columns on these tables, which run from page 104 through 107, the tables include model numbers, production numbers, and a column called ice door storage, which is the same storage system, it is my understanding, is what we see in the refrigerators here in the courtroom.**

**And by X means that Whirlpool and LG have agreed that those models have that ice storage system in it.**

**If you count all the X's, you get about 63.**

Q. **So based on this exhibit and your analysis of these two refrigerators, how many LG models have you concluded infringe the '130 patent?**

A. **Based on my analysis of the units who are in the courtroom, based on what is presented to me in this exhibit in tab 3, I would say 63.**

Q. **I would like to move from the '130 patent on to the '601 patent, Defendants' Exhibit 5, which I believe you will find at tab 5 of your notebook.**

**My first question is: What information forms**

**the basis of your opinions as to whether LG refrigerators have infringed this patent?**

A. **Essentially the same information as the '130, meaning review of the patent in detail, examination of the physical units, review of the patent prosecution history, review of the Court claim constructions, and in addition, some laboratory testing, like what I talked about earlier in the introduction, and some finite element modeling that was done on behalf of LG.**

Q. **Have you considered other information that relates generally to this patent?**

A. **Well, yes. I reviewed inventors' depositions. I reviewed other documents that have been provided. I reviewed development documents provided by LG on their units.**

Q. **As we did with the '130 patent --**

A. **Actually, I stand corrected. I didn't review development documents of the '601 patent.**

Q. **Thanks for that correction.**

**As we did with the '130 patent, I would like for you to just generally briefly summarize what the objective of the invention in the '601 patent is.**

A. **Well, you know, I listened to Mr. Williams this morning, and I think he's elucidated it pretty well.**

**It is a method to reduce thermal bowing in**

refrigerator cabinets. It is a methodology to achieve that, thermal bowing reduction means.

Q. Have you prepared some slides to explain to the jury what bowing is, what causes it, how one would encounter it in a refrigerator cabinet and related issues?

A. I have.

Q. If we could proceed to the next slide, please.

Tell us, why does bowing occur?

A. The ultimate root cause of bowing, refrigerator cabinets bowing, is the basic properties of materials. I think we all can understand that if you take a piece of material, most of them, if you heat them up, they expand. If you cool them down, they shrink. And that property is related to the ultimate structure of the material.

For example, most metals are crystalline. The atoms are lined up in little crystals. Polymers are made up of molecular chains. So the difference between those two gives some pretty significant differences on how those two materials will respond to temperature changes.

The next slide illustrates that. That, in fact, if you were to measure -- if you were to put a temperature gradient, cool a piece of steel from 70 degrees to 0 degrees, it would shrink in length or in size by about .05 percent. A plastic material, like the ABS liner, a material that is used today in many refrigerator lines shrinks by

**almost a factor of 10 greater, .4 percent. Again, it's related to the molecular structure of the materials.**

**That is the ultimate, ultimate root cause of the problem.**

Q. **Why would one encounter bowing specifically in a refrigerator wall like the wall structures that Mr. Williams testified to before the lunch break?**

A. **May I have the next slide, please?**

**Okay. Now, it can't just have two dissimilar materials in contact with another, because if one of them shrinks relative to the other, then they will just slide past each other.**

**Where you get thermal bowing in refrigerator cabinets is because the plastic liner goes to a lower temperature, for example, in the freezer compartment than the steel outer liner, which is at room temperature.**

**But the important fact is they are bonded together and they are bonded together by the polyurethane foam. So as a result they can't act independently, but they must act in concert. They are a composite material. As a result, what the plastic liner wants to do it makes happen to the entire composite structure.**

**To explain that a little bit more, let's take this composite wall that you saw the structure, I believe, this morning. It's essentially a steel shell, with**

**polyurethane foam and then a plastic sheet. Let's imagine that this is inside of a freezer compartment, so the outer side, the steel side basically at room temperature, the plastic liner is initially at room temperature. So we haven't turned the freezer on yet.**

**So everything is the same size. There is no net forces acting on it as a result of temperature gradient.**

**Let's pull that plastic sheet off, separate it out. Now let's cool the freezer compartment down to 0 degrees Farenheit, for example. What's going to happen? Well, as I talked about in terms of the behavior of these materials, that plastic liner is going to shrink down, it's going to shrink, become smaller, is what it needs to do, to accommodate the temperature now it's being faced with, due to its coefficient of thermal expansion or contraction.**

**Then the next slide, now, we are doing a spot experiment here. But we have got this plastic liner shrunk down. But we know in reality it's not separate from the wall. So to put it back to its size that it should be now on the wall, we need to stretch it out, just like you stretch a rubber band, stretch it out, or pulling on it, to make it bigger, and stick it back on the wall as a composite structure.**

**Now it is stuck back on there. You let go of it, but it's stuck to the composite wall. It wants to**

**shrink back. As we see in the next slide, it wants to shrink back, but it's now bonded to these other materials, so it pulls the whole thing, bends the whole thing, and causes it to bow.**

**That is the net result of -- that is thermal bowing resulting from the differences in thermal expansion and a contraction of these materials.**

Q. **How do plaques like the ones Mr. Williams invented prevent bowing?**

A. **Well, what they do is they act in two separate ways, according to the '601 patent. They act as expansion joints and beam elements.**

**I think, if it's okay, I can demonstrate that with a piece of paper.**

**MR. SPEARS: May I approach the witness and hand him mine?**

**THE COURT: Yes.**

**BY MR. SPEARS:**

Q. **There you go, sir.**

A. **It's something we probably all did as kids but didn't quite realize we were exploring the fundamentals of engineering mechanics.**

**We have a piece of paper here. If I try to stretch it, it's pretty hard to pull, it's one piece. If I hold it on edge like this, it just flops over. This is**

**nothing new here.**

**But let me demonstrate the effect of, for example, expansion joints on it by folding it. Now, this isn't Origami, trust me.**

**Now I fold it. What I have created are essentially expansion joints, these little folds. Now when I pull on it, it stretches much more easily, it's more stretchy.**

**And you get an added benefit, because these vertical edges that I have created here act as what we call beam elements. Now if I hold this piece of paper out, it doesn't flop over because we are getting the stiffening as a result of these beam elements, which act just like an I-beam does in a building. You have a flat piece of steel with a piece on top of it. That combination stiffens the entire structure.**

**So you have expansion joints as defined within the '601 patent and beam elements. These in combination, in the right sequences, can act to reduce thermal bowing, by allowing the liner to expand a little bit, reducing the tendency to shrink, reduce the tendency to pull the whole wall and bend it, and then stiffen it to the bending action.**

**If we go to the next slide, we do the same thought experiment, except this time we put plaques in the liner. So we have the liner, it's got plaques in it, we**

**shrink it down. Nothing happens, it just shrinks right down.**

**Now, to complete our thought experiment, we have to pull it back to its original shape, except this time we have got expansion joints in it, so it pulls more easily. So the net result is you don't have to pull it as hard to put it back on that composite liner.**

**In addition, we have got these beam elements in there now which further resist the tendency of this wall to bow. So you put the combination together, as the next slide shows, and you glue that plastic liner stretched out with more stretchy and -- more stretchy and less bendy, in engineering terms, and you put it together and it results in less net overall bowing.**

**So the ultimate advantage of these plaques, as defined within the '601 patent, is to combine these expansion joints with these beam elements to provide overall resistance and reduction in bowing.**

Q. **Now, Dr. Caligiuri, will all indentations in a refrigerator liner, for example, provide expansion joints?**

A. **No.**

Q. **Would you please explain that?**

A. **Well, if we look at the upper picture, let's imagine, instead of creating folds or bends, like I did in this piece of paper, we were to take that piece of paper or some solid**

structure and cut a piece out of it. Take an end and cut a big cut out of it. You don't get the effect of the expansion joints on it. So when you pull on it, it doesn't expand like it does with the expansion joints here.

The lower picture shows what happens. Schematically, this isn't what really happens in refrigerator liners. It is more complicated in the shape.

This illustrates those links that you see which allows you to pull on it and stretch it more easily.

If you were just to take a piece of plastic or something and cut a big channel in it, like the lower picture in the upper section shows, you don't get that expansion joint.

So you can't just look at an indent. But if you were to look edge on to that, you would not be able to necessarily distinguish it from the lower picture. So you can't just look at a channel in a piece of plastic and conclude that it is going to act like an expansion joint.

Q. Dr. Caligiuri, will plaques always prevent wall bowing?

A. No, not at all. In fact, the next slide illustrates that.

For example, if we take the same idea and we take our piece of plastic, and we cut a big piece out of it, big hunk out of it, where you might be getting some beam

**element stiffening or you might be getting some expansion joints, but you have reduced the thickness of the thing overall.**

**And a component of the resistance of the wall to bowing is, in fact, its overall thickness. The thicker the wall, all things being equal, the more resistance there is going to be to bowing. But if you take a big hunk out of it, I think we can all understand, you can swamp out the benefits of those expansion joints and those beam elements and have a net result that bends even more.**

Q. **Now, Dr. Caligiuri, you have mentioned finite element analysis a couple of times during your testimony. Have you seen a finite element analysis of refrigerator wall structures similar to the ones in the LG products that you inspected?**

A. **I have.**

Q. **Could you turn to tab 6 in your notebook, where we have placed a copy of Plaintiffs' Trial Exhibit 248?**

A. **I have it.**

Q. **Could you tell us what this is?**

A. **Well, there was a document that was provided to me, which is basically a finite element model. Like those computational models I talked about earlier, applied to a complete refrigerator cabinet, containing plaques and these indentations and also no plaques. So it is a simulation,**

not an actual experiment, where they have evaluated the effects of plaques or no plaques computation.

Q. Who prepared this finite element analysis?

A. My understanding, it was done at least on behalf of LG. It may have been done by somebody outside of LG. But it was done on behalf of them.

Q. Could you turn to this exhibit to the page -- if you look on the bottom right-hand corner, there are some numbers that had been added. The last two digits are 50.

What, if anything, does this page indicate about the effects of plaques in wall liners similar to the ones that are used in LG's products?

A. Well, it demonstrates how -- it basically is demonstrating the depth of the plaque or the depth of the indent in the LG -- in this simulated experiment, the effect it has on the overall wall bowing.

D0 is the case where you have just a perfectly flat liner, no indents on it at all. D1 is a case where those indents are 1 millimeter deep, D2 is 2 millimeters deep, 3 is 3 millimeters deep, 4 is 4 millimeters deep.

The graph above shows that graphically. You can see, starting with 1 millimeter, you have a decrease in the amount of wall bowing. So the numbers that are in the chart below is the measured amount of wall bowing in millimeters.

So with a smooth plastic wall, case D0, no

**indents, no plastics, then the wall will bow for the temperature gradient given to it 3.74 milliliters. As you add plaques 1 millimeter deep, it reduces it down to 3.68. And as you keep going down, it keeps reducing it. This plaque to me demonstrates the plaques that are similar to what you find in the LG units, in the side-by-side LG units, they will reduce wall bowing.**

Q. **Now, the plot in front of you is entitled, "FEM Analysis Results With Support"?**

A. **Yes.**

Q. **What is the significance of that "with support" language?**

A. **This analysis actually did it two ways. They did it where they have actually put in the supports that look the same to me as what you find in LG refrigerators. Steel corners, steel plates, and looked at the effect with all those components in it. They also did the analysis where they have taken those components out.**

Q. **Let's move on to the claims of the '601 patent. Which claims, if any, did you determine were infringed by the LG refrigerators?**

A. **Claims 1, 4, and 15.**

Q. **I would like to go through the same exercise as we did with the '130 patent. Although, fortunately, this should be considerably shorter. Let's start by putting up the text of**

**Claim 1 from the '601 patent. The first piece I would like to talk about is the "Thermally induced bowing reduction means for an insulating wall structure." I am handing you what has been marked as Caligiuri Demonstrative Exhibit 1. Could you tell the jury what this is?**

A. **This is a piece of a wall I cut out of an LG French door, multi-door model refrigerator, cut it out of the fresh-food wall.**

Q. **Does that have thermally induced bowing reduction means for an insulated wall structure?**

A. **Yes. It has an insulated wall structure. It's obviously got the steel outer layer. It's got the foam. It's got the plastic inner layer. It's all bonded together into one structure. The foam, of course, is in contact here with the plastic liner. But the bowing reduction means or wall structure is these indents you see in here, which are the plaques. You can see them edge on, so, yes, it does.**

Q. **The next language I would like to talk about is "the wall structure comprises bonded together layers of an exterior metal shell, an interior rigid foam insulating layer, and an interior planar plastic layer."**

**Is that true of the LG refrigerator samples that you inspected?**

A. **Yes, I already indicated that. It's got the steel outer liner, the foam, and the plastic inner liner all**

**together.**

Q. **The next language I would like to talk about is a little bit further down where "a bowing reduction means comprises at least one plaque." For this point, do we need to take a look at what Judge Sleet has said about the construction of this patent?**

A. **Yes, but I left it over there.**

Q. **Why don't you let me get it for you, sir. There you go.**

A. **The Court has construed the term "plaque formation" to mean an indentation.**

Q. **Do the LG refrigerator walls that you inspected have such an indentation?**

A. **Well, as we look at the interior plastic layer, we can see indentations put into the liner. So these are plaques per the Court's construction.**

Q. **The next language I would like to take you to is that "the plaque comprises a planar surface integrally formed with said interior plastic layer and offset from the plane in the direction of said foam layer by a predetermined distance."**

**Now, is this another case where we need to take a look at what the Court has said about this patent?**

A. **Yes. The Court has construed the term "planar surface" to mean the bottom surface of the plaque is flat.**

Q. **With that in mind, do the plaques in the LG refrigerator liners have such a planar surface?**

A. **Yes. If we look at these plaques there, you can see, it's got a planar surface here, flat planar surface that's offset from the main part of the plastic wall by an indent here. So it's offset in a direction into the foam.**

Q. **The next piece of this claim I would like to talk about is the language that mentions "edge portions defining boundaries of said planar surface and extending between the planar surface of said plaque and the plane of said interior plastic layer."**

**Do the plaques in the LG refrigerator liners have such edge portions?**

A. **Yes. You can see the edge portions here. They are the offsets here that define the shape of this plaque. As you move around the edge of the plaque, it has edge portions that define the plaque flat surface from the overall surface of the plastic liner. And you can see the effect of the indent here, the edges here in the cross-section.**

Q. **The next piece I would like to talk about is a language stating that "the edge portions provide expansion joints between the plane of said interior plastic layer and the plane of said planar surface such that said edge portions are capable of flexure to absorb thermally induced contraction and expansion of the interior plastic layer."**

**Once again, do we need to look at what Judge Sleet has said about this patent?**

A. **Yes. The Court has construed the term "expansion joint" to mean the edge portions of the plaque that compensate for surface contraction and expansion.**

Q. **Have you determined whether the edge portions in the LG plaques do this?**

A. **Yes, through laboratory mechanical testing.**

Q. **Could you turn to tab 7 of your notebook, where we placed a copy of Defendants' Exhibit 428? I would like to direct your attention specifically to figures 10 and 13 and have you explain to the jury what those are.**

A. **Okay. Figure 10 is a picture of some -- of a tensile test, a pull test I performed on a piece of a plaque liner I removed from a French -- from a side-by-side freezer wall. And you can see that piece is in the test fixture. It's gripped top and bottom, and it's pulled apart by a calibrated piece of equipment called an Instron machine and it's pulled at a fixed displacement rate.**

**What you record is you pull on this thing and you record the force required to pull it times the amount you are pulling. So force displacement curve is what comes out of the raw data on that test.**

**On the right-hand side is a picture of the cross-section of this, the liner before it was actually**

**removed from the polyurethane foam. So it's essentially the same thing that you see in this edge on. So basically, this is not the same model, but this piece of plastic is pulled off and pulled in tension.**

Q. **And what was the result?**

A. **The result is shown on the next slide, which shows that, this is a plot of what we call stress versus extension. Extension is percent. It is a measure of the amount that a piece of plastic is pulled. Stress is the force it took to pull it divided by the cross-sectional area. By taking the cross-sectional area out, you have normalized out any differences in dimensions when you compare one sample to the next.**

**The green line, and each test was done at least twice, the green line is a flat piece of plastic that was cut out of the liner without any plaques in it. So it's the same material, no plaques.**

**It's pulled, and you can see that it stretches as a result of pulling it. That's the green line. That is the stress goes up, the extension goes out.**

**The blue line is the same test -- not the same test, but the same data reduced again into stress, which is force divided by cross-sectional area, and against the extension.**

**Now, the key part here is that if you were to**

**go, for example, to a stress of 1,500 psi, draw a straight line across, what you would see is that to get to a stress of 1,500 psi, it takes ---or we can turn this around, actually. We can go to a fixed amount of displacement, let's say four-tenths of a percent, and go up vertically. What we see, to pull the plastic to 0.4 percent, we would have to put on it about 700 some odd psi, pounds per square inch, on the plaque sample.**

**The flat piece of plastic, no plaques, you have to pull it to well over a thousand psi to get to the same displacement, same amount of percentage of elongation. You have to pull on it harder. What that means is that the plaque sample is more stretchy, if you like, than the non-plaque sample.**

Q. **What does that have to do with expansion joints?**

A. **That demonstrates that these plaques in the LG liner that I tested act as expansion joints.**

Q. **On the next piece of Claim 1 I would like to talk about, if we could get that up, it is the language -- the piece near the bottom that talks about "beam elements on said interior plastic layer." That is the piece I would like to focus on.**

**Have you determined whether the edge portions in the LG plaques provide beam elements on the interior plastic layer?**

A. **Yes. I have done that again through the use of mechanical laboratory testing.**

Q. **Again, I would like to direct your attention to Defendants' Exhibit 428. But this time I would like to direct your attention to figures 7, 8, and 12, and I would ask you to explain to the jury what those figures illustrate.**

A. **This illustrates a test where we do what's called a four-point bending. In this particular case, we are testing the plaques where we are loading them basically perpendicular to the axis of the plaque. So we have got a steel structure underneath it and we are applying another steel structure to the top. Pushing down on it. Bending the piece of plastic.**

**It's called four-point bending because you can see in the pictures, there is four points of contact. And the effect of that is in between the two interior contact points you have uniform applied moment. And as a result of that, you can then record the force versus displacement here.**

**Now, this time you are bending it rather than pulling it, in tension, you can analyze it in a similar way as you did with the tensile test data. This is showing it being tested perpendicular to the plaques.**

Q. **And what are the results of that test?**

A. **This is actually test data from doing the same test, but where we applied the load parallel to the plaques.**

Q. **What figure are we looking at, for the record?**

A. **Figure 12.**

Q. **Thank you.**

A. **This is Figure 12. This is test data from actually testing 90 degrees to what the picture just showed you, which is testing them parallel to the plaques. And what we have plotted here is force versus displacement, where we have normalized the force again by what we call moment of inertia, which basically takes out geometric variations here, divided and plotted against the amount of displacement.**

**In this case, the trend is reversed. What you see here is if you were to go to a fixed amount of cross-edge displacement, let's say one inch, it takes for the samples that -- we tested again for samples that had no plaques in it and samples that had plaques in it, both parallel and perpendicular. What you see here is the green again is the non-plaqued. To displace downward, bend that non-plaqued piece of plastic removed from the LG liner takes about, something under 22 or 23,000 pounds. If you do the same test, normalizing out differences in geometry through the moment of inertia, you get something in excess of 25,000 pounds.**

**So to get to the same amount of bend, you need to bend on it harder in the plaque sample, which means it's stiffer. In fact, it's a 16 percent increase. And that 16 percent increase is maintained all the way down between these green and blue lines.**

**So in the tests that I did on the plaqued and unplaqued liner materials removed from the LG units, you get a beam element effect. You are getting the stiffening effect by increasing the amount of force it takes to bend it for a given displacement.**

Q. **Dr. Caligiuri, has the Court provided any guidance on this beam elements language?**

A. **Yes, it has. The Court has construed the term "beam elements" to mean the edge portions function to stiffen the interior liner to resist bowing deformation. So you can see the plaques in the LG liners have edge portions which stiffen the liner, in bowing deformation.**

Q. **The next piece of Claim 1 I would like to focus on is a tiny little piece which says "the beam elements on said plastic layer" --**

**THE COURT: Ladies and gentlemen, are you okay? Or do you need a break? Is everyone all right? If anyone needs a break, please.**

**Let's take a short break.**

**(Jury leaves courtroom at 3:20 p.m.)**

**(Recess taken.)**

**THE COURT: All right, Ms. Walker.**

**Counsel, we are going to have the verdict form-jury discussion tomorrow, because I forgot, I have a 4:30 teleconference.**

**MR. PARTRIDGE: At the end of the day?**

**THE COURT: Yes. And you can give me whatever recent iteration there might be.**

**(Jury enters courtroom at 3:35 p.m.)**

**BY MR. SPEARS:**

Q. **Dr. Caligiuri, before we broke for recess, we were looking at Claim 1 of the '601 patent and a little piece near the end that talks about "beam elements on said interior plastic layer preventing bowing of said interior plastic layer."**

**Do you have an opinion as to whether the plaques in LG's refrigerators have edge portions that function as beam elements that prevent bowing of the plastic layers in those refrigerators?**

A. **I think the testing I just talked about demonstrates that these edges that we have pointed out here act as beam elements to reduce the amount of bowing or bending that you see in the plastic liner, makes the plastic liner more resistant to bending.**

Q. **In addition to these tests, what other information**

**have you relied upon?**

A. **Well, I have relied upon the Whirlpool patent, which demonstrates that, in fact, if you have plaques with edge portions that act as expansion joints and beam elements that reduce -- that stiffen the structure, you can have an effect where it will reduce overall thermal bowing of the wall. The Whirlpool test results and their FE analysis demonstrate that.**

**In addition, as I discussed earlier, we had the FE results that were created on behalf of LG which demonstrate the same effect.**

Q. **Finally, I would like to look at the last piece of Claim 1 that talks about "intermediate foam insulating layer closely embracing said edge portions."**

**Is that found in the LG refrigerators?**

A. **Yes. As I pointed out earlier, if we look at this composite wall structure removed from an LG multi-door unit, you can see how the blown-in foam, the polyurethane foam, that basically is in direct contact along the entire interface here with the plastic, in particular around the edge portions that define the plaque. So it's closely embracing the edge portions.**

Q. **I would like to turn from Claim 1 and look briefly at Claim 4. There the claim talks about the bowing reduction means of Claim 2 -- we will get to that shortly --**

**"comprising at least one aligned pair of plaques," and then it has further language, stating "the position of the aligned plaques and the relative positions of edge portions of the aligned plaques."**

**Is that language satisfied in the LG wall liners that you have inspected in this case?**

A. **Well, yes. If we look at this wall structure again and focus on the interior plastic liner, you can see that you have parallel arrays, aligned papers if you would like, or plaques, you can see that run parallel to each other.**

Q. **As we noted, Claim 4 refers back to Claim 2. Let's take a look at that claim.**

**In Claim 2, "the bowing reduction means," which I believe you indicated is the plaque, "of Claim 1 wherein the planar surface of each plaque is generally rectangular in shape." Is that true of the LG plaques that you have inspected?**

A. **Yes. Here is, again, if we look at this section of composite wall and look at the plastic liner, you can see that the plaques that were defined by these indentations on the edges are essentially rectangular in shape.**

Q. **What I would like to do next is take a look at Claim 15. This is a fairly long claim. In fact, it's a very long claim.**

**Instead of breaking it up into individual**

**pieces, I would like for you to just generally summarize what the differences between Claim 15 and Claim 1 are.**

A. **It basically is the same as Claim 1, except it applies to a side-by-side unit, where it talks about walls facing each other in the freezer compartment and things like that. So it applies directly, specifically to a side-by-side model.**

Q. **Does it apply to the side-by-side LG refrigerators with plaque wall liners that you have inspected?**

A. **Yes, it does.**

Q. **What opinion have you drawn, if any, regarding whether those refrigerators infringe Claim 15 of the '601 patent?**

A. **The side-by-side refrigerators, as I have inspected, infringe on Claim 15 of the '601 patent.**

Q. **I would like to direct you to tab 8 of your notebook, where we have placed copies of Caligiuri Demonstrative Exhibits 117 to 133. Could you tell us generally what those are?**

A. **These exhibits, 117 through 133, are basically the results of my infringement analysis on the electrical units side-by-side and French-door, going through the same process that I did on the '130 patent, element by element, limitation by limitation, and comparing the language in the limitation with what I see in the actual LG units. So it's essentially the same thing. It is the same thing about**

**which I discussed earlier, physical inspection of the LG units.**

**It is a photographic and written description of my infringement analysis.**

Q. **Once again, I would like to direct you to Defendants' Exhibit 815, which, by way of recall, is at tab 3 of the binder. I would like to direct your attention to page 95 of the exhibit and the back of that exhibit.**

A. **Okay.**

Q. **Using the information in this exhibit, have you determined how many LG refrigerator models infringe the '601 patent?**

A. **Well, the analysis is the same as what I did on the '130 patent. You had an in-door-ice storage system. Again, this is a document that as I understand it represents an agreement between Whirlpool and LG as to which units that LG manufactures or has manufactured contain reference "freezer liner," which means indentations in the liner. Each one is marked with an X. So you can go through and count up all the X's for each of the model numbers. I counted them up to be 300 and some odd -- 316.**

Q. **Okay. I would like to set aside the '601 patent for now and go back to sort of other issues surrounding the '130 patent. What I would like to talk about is sort of the timeline of that patent, and certain LG development activity**

**regarding the products that you have opined infringe the '130 patent.**

**Before I do that, have you reviewed documents that were generated by the LG engineers who developed the products that are accused of infringement?**

A. **I have reviewed documents provided to me, yes.**

Q. **What other information have you reviewed about LG's development history?**

A. **Well, I think it relates to the documents that were produced.**

Q. **All right. What I would like to do is to start with the '130 patent, which is Defendants' Exhibit 8, and begin to build a timeline to start with that patent, and place certain milestones, if you will, or items in LG's development history in the context of these particular times.**

**So we have the '130 patent. Can you tell us when Whirlpool filed the application for that patent?**

A. **It was filed on December 28th, 1998.**

Q. **When did that patent actually issue?**

A. **July 4th, 2000.**

Q. **And have you heard some information attending trial about the time or date, if you will, when Whirlpool first introduced in-door-ice products covered by the '130 patent?**

A. **I believe I heard Mr. Myers testify this morning**

**sometime in the spring of 2000.**

Q. **So if we could put up our timeline. Have we accurately set out the date the application was filed, the date of first introduction of Whirlpool's in-door-ice products, and the date that the '130 patent issued?**

A. **Yes. I mean, I think I heard spring of 2000. But it says early 2000.**

Q. **Next I would like to take a look at, if we could have Defendants' Exhibit 16 put up, the front page of the exhibit.**

**What is this document?**

A. **Well, as I look at it and review it, in English, it appears to me a status report or a planning report on LG's effort to develop ice and water delivery systems. And the document is dated May 4th, 2001.**

Q. **Let's take a look at the page that ends in 784. What on this page did you find interesting about LG's development history?**

A. **When I look at the figure on the left-hand side, in fact, the left-hand drawing on the left-hand part of the chart, I see in cross-section a description of some components, "Bank ASM," "Motor ASM," "Ice Maker ASM." If we look at that, it looks remarkably similar to the preferred embodiment described in the -- the figure of the preferred embodiment described in Whirlpool's '130 patent.**

Q. **From this document, what, if anything, did you conclude about LG's awareness of the '130 patent as of May of 2001?**

A. **Based on this, it looks like they were aware of the patent.**

Q. **So if we could return to our timeline, would it be fair to add to that timeline an element for May of 2001, LG is aware of the '130 patent?**

A. **Well, it seems reasonable, based on the picture and figure that I saw in that document.**

Q. **The next document I would like to turn you to is Defendants' Exhibit 196. If we could have the front page of that put up.**

**What is this document?**

A. **Well, I have reviewed the English translation of it. Again, it's another status report on the internal development efforts on in-door water and ice delivery systems for LG's products. It's dated May 2nd, 2000 -- sorry, October 5th, 2002. Or is that May?**

**Sorry. May 10, 2002.**

Q. **Could we turn to the page 416 on that document?**

**And what on that page did you find interesting about LG's development history of the products that you concluded infringe?**

A. **Well, if I look at bullet No. 3 there, where they are**

talking about their efforts on the freezer section, it says to "reestablish design concept that can catch up with W/P," Whirlpool's, "door bin-attached ice maker."

So it seems to me that LG at this point was deciding or making the decision to put in their own products a design concept to catch up to the technology already present in Whirlpool's in-door-ice system.

Q. So if we could return to our timeline. As of May 2002, have we put on the timeline the language that you just read from that document?

A. Yes.

Q. The next document I would like for you to take a look at is Defendants' Exhibit 188, if we could have that put up.

What is this document?

A. Well, again, it's an internal LG document related to its ongoing development efforts to develop a door ice maker, in-door-ice maker, water delivery system.

Q. I am sorry, Dr. Caligiuri. I have jumped ahead of myself. I would really like to put up Defendants' Exhibit 167.

A. Okay.

Q. What is this document?

A. This is a United States Patent No. '701 issued to Mr. Kim from LG.

Q. What was the date that this patent application was

**filed?**

A. **You have to look down, because there was a prior foreign application. So if you go down to the foreign application priority date, it's actually May 31st, 2002. The application for this patent was actually filed in Korea.**

Q. **What did you find interesting about this Korean patent?**

A. **Well, I looked at the patent --**

Q. **I am sorry. I withdraw that question.**

**What did you find interesting about this LG patent?**

A. **Well, what was interesting to me is the similarities between its Figure 3 laying out the components in its in-door-ice system as described in this patent and the same figure in Whirlpool's '130 patent dating from 2000.**

Q. **All right. Have we juxtaposed those figures up on the screen?**

A. **Yes. On the left-hand side is Figure 3 from the '130 patent, which is Whirlpool's preferred embodiment of the '130 patent, its in-door-ice system.**

**On the right-hand side is LG's figure from the patent I just looked at a minute ago, Figure 3. And it looks surprisingly similar, including the shape of the vertical auger here. The differences include a water filter No. 70 at the bottom and, of course, the ice maker here at**

**least on this picture seems to be on the door rather than mounted on the roof. But other than that, it is remarkably similar.**

Q. **What did you conclude from this similarity?**

A. **Well, based again on the similarities, it supports the idea that LG was aware of the '130 patent in 2002, May of 2002.**

Q. **So returning to our timeline, would it be appropriate to put, for May of 2002, LG files Korean application?**

A. **Yes.**

Q. **Now let's take a look at Defendants' Exhibit 188.**

**Once again, what is this document?**

A. **Again, as I reviewed it, it is an internal LG document, talking about its ongoing project to develop door ice makers in their product lines. And here they call it "door icing."**

**This document is dated October 16th, 2002.**

Q. **Let's take a look at page 680 of this document.**

**What did you find there that was informative about LG's development history?**

A. **Well, what is of interest here is up in the upper left-hand corner, where as of this date here they are talking about ways to avoid the patent. Given what I had seen from the earlier documents, it looks like it's avoid the Whirlpool patent, '130 patent, and to generate ideas to**

avoid the patent.

Q. Could you turn to page 678?

On the right-hand corner, do you see a reference to sort of where it says, "Develop Whirlpool ice bank patent avoiding technology"?

A. Yes, I see that.

Q. And what did you conclude from that?

A. Basically, it confirms the idea here that, at least based on this document, that LG was actively looking at ways to avoid the technology in its '130 patent, to design around, avoid what is in that patent.

Q. Let's go back to the timeline?

And would it be appropriate to stick on that timeline a flag for October 2002, indicating that about that time LG brainstorms on how to avoid Whirlpool's patent?

A. Based on the documents, it looks like they were thinking about ways on how they can avoid the patent based on what's written in the documents.

Q. Let's look at some more LG documents. Specifically, Defendants' Exhibit 186. What is this document?

A. Well, it's another internal document from LG, talking about, it's the project leader workshop, and they are talking about the refrigerator ice mater in door, the Bics. By reviewing documents I have come to learn that "Bics" is the LG term or assigned term for their in-door-ice project

for their side-by-side refrigerators, what we saw ultimately on the right-hand side over there, the refrigerator. So it's again a status report, report on where they are on it.

Q. What period of time is this summary directed to?

A. Well, based on the document there, it says, "Project Summary & Goal," October 2002 to December 2003. So it's sort of an update on what they did, the accomplishments they made, the progress they made basically through 2003, late 2002.

Q. Do you see next to the heading "Project Leader" a reference to Myung Nyul Lee?

A. I do.

Q. Does that appear to be Dr. Lee's picture in the upper right-hand corner?

A. I can't tell from that picture. Sorry.

Q. With respect to Whirlpool's patent, what does this document indicate about LG's development objectives in this time period of 2002 to '03?

A. Well, sort of in the middle of the page, under the -- sort of below the couple of bullets there, it says one of the key specifications or technology is to draw up an ice maker with a water overflow prevention and also to develop the bank.

Remember, in LG's terminology, based on the documents that I have reviewed, bank to them means storage

**bin, bank for holding the ice. That avoids Whirlpool's patents.**

**So again, they are working on technology to avoid Whirlpool's patent.**

Q. **Let's go to the timeline again.**

**Once again, would it be appropriate here to stick a flag around 2002 to 2003, indicating that LG was trying to avoid Whirlpool's patents during that time period?**

A. **They certainly viewed key technologies trying to avoid it, yes.**

Q. **Let's take a look at a document that shows just how hard they were trying to do that. That would be Defendants' Exhibit 336.**

**Can you tell us what this document is?**

A. **Another internal document from LG, summarizing the project related to, again, the in-door-ice making system.**

Q. **Can you turn to the last page of that document?**

**What does the middle bullet point refer to?**

A. **It says, "Countless meetings for ideas were held every morning to avoid the Whirlpool storage bank patent. Discussions after discussions." They were talking a lot about it, based on what's written there.**

Q. **Let's take a look at some of the things that LG proposed doing in trying to design around the Whirlpool patent. To do that, let's look at Defense Exhibit 175.**

**Can you tell us what this document is?**

A. **It's an internal LG document. It looks like it's a scheduling-type document. It's about certain projects they are doing, one of which is the Bics project, which, as I said earlier, based on my review of the documents, is LG's development effort for an in-door-ice system on their side-by-side models.**

Q. **Can you turn to page 906 of that document?**

**Does that list some of the design around alternatives that LG was investigating at this time with respect to the Whirlpool patent?**

A. **Well, they are talking about a lot of different details and systems, including water overflow preventing. These are ways, the problems and what they are trying to do to solve problems. One of them is water overflow preventing, one is full ice sensing, sensing when the ice bin is full. And speeding up the ice-making, that is No. 4.**

**No. 3 relates to the storage system, the ice bank structure. And they are looking at, to me, as I read this, two things. One is a horizontal-type method and one is a vertical-type method, which they call LG's own rotating bank.**

**The horizontal-type method, based on the documents I looked at, it refers to something called a Hitachi open patent. There is an open patent application in**

**Japan which talks about a horizontal-type auger system where the ice is moved horizontally. So instead of, in the preferred embodiment in the Whirlpool system, the ice moving vertically, in the Hitachi system it's being moved horizontally out to the discharge chute. It's called a horizontal-type method and an open patent, a patent that has been out in the public for a while.**

**The other method that they are looking at is a vertical=type method. But it calls it LG's own rotating bank. So the ice auger drive system is vertically oriented, but the physical storage bank is rotating around some presumably fixed structure.**

**So they are looking at two ways here to develop their -- what they call their ice bank structure.**

Q. **Let's move on to Defense Exhibit 185.**

**What is this document?**

A. **It's another internal LG document. Again, it's talking about the Bics project. You see "Bics" at the top. It looks like it's a development period, it's a project plan summary. So it appears to me it's sort of a summary of where they are in the project.**

Q. **Where they are as of what date?**

A. **As of -- if you look under the "Bics II," you see January to December 2004. So the year of 2004.**

Q. **Let's look at the timeline on -- this is a little**

**awkward to work with, this document. There is a timeline on page 88. In the English translation we have got kind of how the blanks on -- how the Korean language in the blanks would be filled in with English translation.**

**So you spoke some about two potential design-around alternatives that LG was considering with respect to the '130 patent. What does this timeline indicate with respect to the success or failure of these design-around efforts?**

A. **Well, the previous documents certainly indicate that LG was actively trying to avoid the patent. They are trying two methods here to develop their own ice storage system, ice bank, through a horizontal type and/or a rotating type.**

**It looks like they believe they were doing that over the periods from early 2003 to -- sort of the middle of 2003, at least it lists on that chart. Below that it shows some pictures on here. It is kind of hard to tell. One is the rotating version. One is the horizontal version.**

**But then sometime toward the middle of presumably 2003 here, they switched to what is called the front-loading system. The front-loading system is what I showed you earlier, for example, in the side-by-side, with the front moving onward, which means the auger moves the ice front to back, rather than horizontally or vertically. So they apparently in that time frame gave up on the horizontal**

**and rotating type and moved to the front-loading type, which they ultimately implemented.**

Q. **Finally, I would like to take a look at Defense Exhibit 335. But before doing that, I would like to go back to our timeline.**

**Would it be appropriate to stick another flag on that timeline, indicating that somewhere around September of 2003 LG adopted its current time?**

A. **Again, based on the documents I have seen and looked at in that chart I just showed, it looks like they made the decision sometime around September of 2003 to move to the front-loading design.**

Q. **They made that decision after all these morning brainstorming sessions about how to avoid the patent?**

A. **They certainly talked about avoiding it a lot, yes.**

Q. **Now let's go to Defendants' Exhibit 335. What is this document?**

A. **This is, looks like, another LG report, document. Their project completion report. It looks like the final report on their efforts, a completion report on their efforts to develop the Bics system, which is the in-door-ice system for their side-by-side. It's dated December 16, 2003.**

Q. **Could you turn to page 774 of this document?**

**What did you find interesting on this page?**

A. **Well, it's an interesting phrase there, where it's highlighted. It says, "Since Whirlpool has the uniquely advanced technology and rights in this area, a dispute is expected when product is developed."**

Q. **Now, if LG thought they had successfully designed around Whirlpool's patent, would they have said that in this document?**

**MR. COYNE: Objection, Your Honor.**

**THE COURT: Sustained.**

**BY MR. SPEARS:**

Q. **Let's go back to the timeline.**

**Would it be appropriate to add another flag at this timeline indicating that as of December 16, 2003, LG expected the dispute with Whirlpool?**

A. **Based on that document, yes.**

Q. **Bottom line, Dr. Caligiuri, did LG copy this invention?**

A. **It sure looks that way to me.**

**MR. SPEARS: No further questions. Pass the witness.**

**THE COURT: You may begin your cross-examination, Mr. Coyne. We will go till 4:30.**

**MR. COYNE: Yes, Your Honor. Thank you.**

**CROSS-EXAMINATION**

**BY MR. COYNE:**

Q. **Good afternoon, Doctor.**

A. **Good afternoon.**

Q. **Let me start with going back to your background. You have been retained as an expert witness over a hundred times, right?**

A. **Probably, based on, if you include both depositions, trials, and arbitrations, it's approaching that number.**

Q. **At one of our previous depositions, I think you said it might have been over 200 times, right?**

A. **I don't remember 200.**

Q. **But you have testified over 70 times at depositions and trials, correct?**

A. **Yes. That's probably about right.**

Q. **Over 50 percent of your work is related to participating in litigated matters, correct?**

A. **It really varies, depending upon what is going on week to week, month to month. It probably averages somewhere 40 to 60 percent, in that range, yes.**

Q. **Would it be fair to say that you are a professional witness?**

A. **I am not sure what you mean by "professional witness."**

Q. **All right. Over 60 percent of your work is in the area of failure analysis, right?**

A. **If I looked at my overall project mix, yes, including work I do on failed components, assessing problems and**

things, yes, it's probably about 60 percent.

Q. I would like to go back to the time you were at Lawrence Livermore. Very impressive laboratory, isn't it?

A. Yes.

Q. But you didn't do any work in the appliance field while you were there, did you?

A. No.

Q. And when you were at SRI, you didn't do any work in the appliance field, did you?

A. No, I did not.

Q. In fact, there has only been three projects in which you have been called to testify as an expert in a patent infringement matter. Right?

A. Called to testify?

Q. Yes, sir.

A. Yes, that's correct.

Q. And, in fact, all three of those were for Whirlpool?

A. That's correct.

Q. And would you consider Whirlpool to be a major client of yours at your company?

A. They are a client, yes. I think "major" depends upon what you mean by that. We have been working at my company with Whirlpool on and off for a long time, since the early 1990s.

Q. Sir, you have published over 100 technical journals,

articles, reports, presentations, correct?
A. There is a lot, yeah.
Q. But not one of them relates to in-door-ice storage systems, does it?
A. No, sir.
Q. Not one of them involves household refrigerators, does it?
A. Open literature publications, no.
Q. You have never designed a refrigerator?
A. I have never designed a refrigerator all by myself. But there is probably nobody that really does that. Design of refrigerators are teams of people. I certainly participated in design efforts, yes.
Q. About a refrigerator?
A. Yes.
Q. And you never authored a book or article about refrigerators, have you?
A. No, I have not.
Q. You have also never participated -- you just provided testimony for the jury about LG's efforts to design around, but you yourself have never participated in an effort to design around a patent, have you?
A. No, I have not.
Q. And you also have no patents of your own, right?
A. That's correct.

Q. **You have never even applied for one, right?**
A. **That's correct.**
Q. **And you never looked at a prosecution history until you started participating in these patent infringement matters for Whirlpool, right?**
A. **Well, I think I have looked at prosecution histories and other patent issues that I have been involved in. In terms of testifying, it would have been for Whirlpool, yes.**
Q. **In terms of the documents that you were provided, you did not conduct your own independent investigation of the various documents that were produced by the parties in this case, did you?**
A. **Well, I was supplied a set of documents which I reviewed, yes.**
Q. **You were supplied a set of binders by Whirlpool's counsel, right?**
A. **That's correct.**
Q. **And those are the documents that you limited your review to, right?**
A. **That's correct.**
Q. **And there wasn't more than a million documents in that, was there?**
A. **No.**
Q. **Well, there is many more than that produced in the case. Would it be fair to say that it was a small subset of**

**the total amount of information that was available to you?**

A. **I don't know how many were produced, so I don't know if it's small. But definitely it's a subset, I am sure.**

Q. **You did mention some testing. You've seen Dr. Vannoy and Mr. Dapkunas in the courtroom from time to time in the last couple days, haven't you?**

A. **Actually, I don't know who they are.**

Q. **In any event, you have reviewed some testing that they did, tensile and flexure and wall bowing testing from Trident Engineering, didn't you?**

A. **Yes, I reviewed it in the reports they filed in this matter, yes.**

Q. **That is testing that they did, correct?**

A. **Well, either they did it or they did it through some other organization, yes.**

Q. **And you had someone else at Exponent do the testing that you have referred to on your direct testimony, correct?**

A. **Well, yes, I had an engineer at Exponent do the work under my direction, the same way I am sure Dr. Vannoy and Dr. Dapkunas had people helping them in doing their testing.**

Q. **We will hear from them on exactly what they did. Suffice it to say, you didn't get your hands doing the testing, right?**

A. **No, I didn't go down and turn the machines on, but I was down there seeing what they were doing, supervising the**

work effort, yes.

Q. You had talked about these units over here, let's switch to a different topic for a few minutes. DTX-22 and 23, the two LG refrigerators that you had referred to. When you were looking at the side-by-side unit --

MR. COYNE: May I approach the units, Your Honor?

THE COURT: Yes.

MR. COYNE: I will try to speak up so we can pick up the sound.

BY MR. COYNE:

Q. You identified -- this says the freezer compartment, right?

THE COURT: Referring to DPX-23.

BY MR. COYNE:

Q. I am indicating the left side cabinet portion of the unit.

A. Yes. That's the freezer component, yes.

Q. And this is a freezer door, right?

A. Yes, it's a door to the freezer compartment. It's also the closure member of the freezer.

Q. This over on the right-hand side of DPX-23 is the refrigerator compartment, right, fresh food?

A. Yes, it is.

Q. And this would be a refrigerator door, right?

A. **It would be the fresh-food door, yes.**

Q. **And both of these doors, I believe you identified on DPX-22, the French-door bottom-mount model, both of the top doors are refrigerator doors, right?**

A. **They are doors mounted on a refrigerator cabinet, yes.**

Q. **And the cabinet that they open up to, both of them, is the refrigerator cabinet, not a freezer cabinet, right?**

A. **They open into the fresh-food door and they open also in part the access to the upper freezer compartment.**

Q. **The lower portion, the pull-out drawer that slides straight out, that is the freezer, right?**

A. **That is the lower freezer compartment. And that is the closure member for the lower freezer compartment.**

Q. **Sir, let me ask you, do you have kids?**

A. **Sorry?**

Q. **Do you have kids, children?**

A. **Well, a long time ago. They are grown up now.**

Q. **Think back to when they were teenagers. I have got -- two just came out of being teenagers, but one of them still is.**

**Where you told them to go put the pizza in the freezer compartment of the three-door bottom-mount freezer, which compartment are they going to put it in, in the left-hand upper door or the bottom pull-out slide and tray?**

A. **Well, first of all, when they were teenagers, I**

**probably couldn't have afforded that model on the left.**

Q. **Assume hypothetically you could.**

A. **Okay. Yeah, they would have put it in the lower freezer compartment, absolutely.**

Q. **They wouldn't have even thought twice about trying to cram it into the ice room, would they?**

A. **Actually, after finding some of the strange things in my refrigerator, I am not sure they wouldn't have.**

Q. **I appreciate that. My kids drive me crazy sometimes, too, but I have found over the years they often have more common sense than I do.**

A. **Not when they put their socks in there.**

Q. **Let's go back to this Gould reference. Can we bring up PTX-127?**

**This was the patent to Gould that we were looking at earlier during your testimony. I am looking for the laser pointer. I am afraid I buried it.**

**This portion right here, this cabinet right here, do you see that portion, sir?**

A. **Yes, I do.**

Q. **Just for purposes of our discussion, can we call that an ice-making room?**

A. **That's what we are going to call it.**

Q. **That will be fair. Thank you very much.**

**If we look over here at the LG product --**

**MR. SPEARS: Your Honor, objection. Can we have a sidebar?**

**MR. COYNE: Your Honor, I will withdraw the question. I anticipated the issue. I will move on.**

**BY MR. COYNE:**

Q. **If we look at the Gould structure --**

**MR. SPEARS: Same objection.**

**MR. COYNE: Your Honor, I am talking about the prosecution history of this patent.**

**THE COURT: Let's see where we are going.**

**BY MR. COYNE:**

Q. **I am trying to understand, sir, how you are interpreting this patent. If I look at this structure here, this area is below freezing, correct?**

A. **Mark that again, I am sorry.**

Q. **This compartment here where the ice maker and bin are, that's kept at a below-freezing temperature, correct?**

A. **You know, I am not so sure. When you look at the Gould patent, the Gould patent talks about a thermoelectric way of making ice rather than blowing freezing air into that compartment.**

**Whether that thermoelectric device, which is basically a metal plate that you apply electric current, because the properties of it actually sucks the heat, the way you make the ice in this thing is you have this rubber**

**ice mold system that is moving on a belt. You fill it with water, and it passes over this plate. And the heat gets sucked out of the wire and it freezes it and, of course, it falls over and drops into the bin there. That is a totally different technology than blowing freezing air in there.**

**So I don't know just looking at the patent whether that thermoelectric device is sufficient to keep that entire chamber below freezing.**

Q. **Sir, if it isn't sufficient to keep it below freezing, common sense would indicate that the ice is going to melt, wouldn't it?**

A. **That's correct, and it may do that.**

Q. **You have an ice bin down here. You've read the Gould patent, right?**

A. **I have.**

Q. **There is no thermoelectric device in this location where the ice storage bin is, is there? In fact, it's up here in this upper portion, correct?**

A. **That's correct. And the ice that falls into that bin could melt. And in fact there are products out there where you make ice like that system and the ice falls down into a bin and then it doesn't stay below the freezing temperature and ultimately it melts.**

Q. **Part of the understanding you have in reaching your opinions in this case is that even though Gould discloses**

**that this is an ice-making unit, your view is that it's not kept at a below-freezing temperature. Is that right?**

A. **I didn't say that. I said I don't know, because it's possible that thermoelectric plate sucks enough heat out of that room to keep it below freezing. I just don't think you could say that it does.**

Q. **But suffice it to say, sir, that this is where the freezing that happens in this unit occurs, in that room. Right?**

A. **The freezing of the water occurs in the rubber ice mold as a result of the thermoelectric plate, that's correct.**

Q. **Of all the areas in this unit, the only place where freezing is going to occur is inside this room, inside the little room bounded by this door, the cabinet, and the bottom where the ice bin is sitting now, the area designated "22" in the picture in Gould. Correct?**

A. **That's correct. And you have to remember that you could actually leave that refrigerator door open and actually leave the little door open, No. 24, and still make ice.**

Q. **What is the basis for that opinion, sir?**

A. **Because you don't affect the thermoelectric effect by having those doors open. It will make ice irrespective. The ice will flow into the bin. It will still make ice**

**because the thermoelectric effect is not containing freezing air to make the ice.**

Q. **That is your view of how Gould is designed, the ice falls into the bin and melts?**

A. **The ice falls into the bin. Obviously, you would keep those doors closed because you don't want to waste energy. But I think, I don't know, because I don't know overall the effect of that thermoelectric plate in there. What I am saying is the difference between this and a freezer where we think about blowing freezing air in there, if you leave the doors open on the freezer, you ultimately will not be able to make ice. You can leave those doors open and make all the ice you want.**

Q. **Sir, in your view, the examiner, when he initially rejected these application claims and said that that is a freezer compartment, in your view, he was wrong. Right?**

A. **Like I said, I don't know, because maybe that thermoelectric plate keeps that whole room below freezing. I just don't know.**

Q. **Sir, I am going to ask you to assume that, because it is disclosed in the patent, that it is an ice-making room and in order for the ice to remain ice, it's going to have to be below freezing. Right?**

A. **Like I said, there are products on the marketplace where they make ice using a cold plate that falls into a**

**chamber down below. You have ice down there. Ultimately, it's going to melt.**

Q. **Sir, can you point out to me in Gould, you have that in your binder up there, can you point out to me where Gould discloses anything where that room is kept above freezing temperatures?**

A. **Well, I can look at the patent. But I can be pretty sure it doesn't disclose that, and it doesn't disclose that it's below, either.**

Q. **But it does disclose that the freezing of the ice occurs in that compartment, right?**

**MR. SPEARS: Objection. We have given Mr. Coyne a fair amount of leeway. And I have not heard anything that comes close to comparing the point to the claims of the patent.**

**THE COURT: Sustained. You don't need to speak further. Sustained.**

**MR. COYNE: Your Honor, I would like to go back to the prosecution history.**

**THE COURT: I have just sustained the objection, Mr. Coyne. Don't keep pressing, especially at 4:30 in the afternoon.**

**MR. COYNE: Thank you, Your Honor.**

**BY MR. COYNE:**

Q. **Sir, you said in your opening report in this case that**

this was a case of straightforward copying, right?
A. I don't have my report in front of me to look at directly. It's possible I said that.
Q. Mr. Brooks, can you bring up the report? It is the opening infringement report at 15.
THE COURT: What was the question?
MR. COYNE: That he referred to LG's activities in this case that he has described in his direct as straightforward copying.
THE COURT: In the previous report?
MR. COYNE: Yes, Your Honor. I am sorry. My eyes are not what they used to be, Your Honor, and I am having a hard time reading it.
BY MR. COYNE:
Q. Does this help refresh your recollection, sir, whether you referred to LG's activities as straightforward copying?
A. Well, it says evidence of LG copying of the Whirlpool product. It is clear that LG considered the Whirlpool -- it is clear that LG considered the Whirlpool patent and the in-door-ice making, storing, and delivery system during their design process and copied the claimed invention.
Q. I am directing you to the straightforward copying, the fourth line up from the bottom, you used the phrase "by straightforward copying." Right?
A. Yes.

Q. **So it's a knockoff?**

A. **I am sorry?**

Q. **It's a knockoff?**

A. **By saying straightforward copying of what the Whirlpool patent is, yes.**

Q. **So we should expect to see very few or no differences if we go through the structure of the alleged infringing devices and Whirlpool's patent, the '130 patent. Correct?**

A. **Well, you know, as I think about it, you can copy something, but you don't have to copy every little detail of it.**

Q. **Let's go back to the thing you finished with in your direct testimony. You had mentioned on your earlier part of your direct testimony that you believe that the ice storage bin in LG's device had an upper and lower bin. Correct?**

A. **Yes.**

Q. **Okay. Yet in your testimony before Mr. Spears finished, you had indicated that the ice moves front to back rather than vertically. Is that correct?**

A. **The ice moves front to back relative to the position of the auger and relative to the position of the door.**

Q. **Do you still have the ice bin up there, sir?**

A. **I do.**

**MR. COYNE: May I approach the witness, Your Honor, and collect it from him for a moment?**

**THE COURT: Sure.**

**BY MR. COYNE:**

Q. **Sir, you had described this bin when you were with Mr. Spears a few minutes ago as the ice being moved from this front section of the bin by the action of the auger, moving the ice axially in the direction of the axis of the auger through this hole and into the ice-crushing region. Correct?**

**THE COURT: Do you understand that question, ladies and gentlemen?**

**You do. You are better than me. Go ahead.**

**MR. COYNE: Your Honor, I would be happy to withdraw it.**

**THE COURT: Why don't you rephrase that.**

**BY MR. COYNE:**

Q. **Let me break it up.**

**Sir, you mentioned in your direct testimony that there is an auger, correct?**

A. **That's correct.**

Q. **That's this little plastic plate in here, that's got two fins on it, right?**

A. **Well, the auger and the shaft together -- the plastic part and the shaft together make it.**

Q. **That auger is connected to a shaft?**

A. **Yes.**

Q. **The shaft is oriented this way, horizontally, not vertically, right?**

A. **It's oriented front to back relative to the door, yes.**

Q. **That's why LG called it a front-loading system, right?**

A. **I presume that is to distinguish what they were looking at in terms of a horizontal system.**

Q. **Or in terms of a vertical system, right?**

A. **Well, they referred to it separately from the horizontal system.**

Q. **You have three axes. You have a vertical axis?**

A. **Yes.**

Q. **That is what Whirlpool discloses in its '130 patent, right?**

A. **They disclose it in the preferred embodiment, yes, it does that. It doesn't specify that specifically in the asserted claims here.**

Q. **And there is two other axes. You could have it horizontally, side to side. Right? That would be one horizontal system, correct?**

A. **I am referring to the position of the auger, because the ice always drops out the bottom.**

Q. **Yes, sir. We are referring to the position of the auger. One orientation alternative to vertical, up and down, would be side to side of the unit, correct?**

A. **Where the auger is moving side to side relative to the**

door, yes.
Q. And then the other orientation would be where the auger is moving front to back, correct?
A. Relative to the door, yes.
Q. And that's the orientation that LG decided to settle on after it finished its design work with a front-loading system that went front to back, correct?
A. That's correct.
Q. Okay. And the Whirlpool '130 patent discloses a vertical system, up and down, right?
A. It discloses in its preferred embodiment a vertical system. But the asserted claims here, which is ultimately what influences infringement, do not specify the orientation of the auger.
Q. Sir, Claim 8 does, doesn't it?
A. I don't believe so.
Q. It talks about an upper and lower ice bin, correct?
A. It has nothing to do with the auger.
Q. I will get to that in a second, then.
In any event, the ice in the front-loading system moves through the hole in this plate where my hand is. Do you see that?
A. Yes.
Q. Then it goes into a smaller region back here where the ice-crushing blades are located and the ice is either pushed

**out or crushed, and comes out the bottom opening through the force of gravity. Correct?**

A. **The ice is moved through that opening you pointed to with your hand by the auger and it pushes out through the bottom opening after passing through the ice-crushing region.**

**MR. COYNE: Your Honor, may I have permission to publish the bin to the jury?**

**THE COURT: I think we will take our break for the day. We will adjourn. You can do that when we resume tomorrow morning.**

**Ladies and gentlemen, we are going to start a half-hour later tomorrow morning. I have an early morning meeting. So we will start at 9:30. Please remember my earlier parting instructions to you. Have a safe trip home. We will see you tomorrow at 9:30.**

**Let's recess.**

**(Jury leaves courtroom at 4:29 p.m.)**

**(Court recessed.)**