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Transcript of Robert M. Kimmel, Sc.D.

Date: April 17, 2026

Case: ClearCorrect Operating, LLC -v- Align Technology, Inc. (PTAB)

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WORLDWIDE COURT REPORTING & LITIGATION TECHNOLOGY

1 UNITED STATES PATENT AND TRADEMARK OFFICE

2
3 BEFORE THE PATENT TRIAL AND APPEAL BOARD

4
5 CLEARCORRECT OPERATING, LLC,

6 Petitioner,

7 vs.

8 ALIGN TECHNOLOGY, INC.,

9 Patent Owner.

10
11 CASE NOS. IPR2025-00818
12 IPR2025-00819
IPR2025-00820
IPR2025-00821

13 US PATENT NOS. 10,973,613
14 11,154,384
11,648,090
11,648,091

15
16 STENOGRAPHIC DEPOSITION OF

17 ROBERT M. KIMMEL, SC.D.

18 ATLANTA, GEORGIA

19 FRIDAY, APRIL 17, 2026

20 REPORTED BY: TANYA L. VERHOVEN-PAGE,
21 CCR-B-1790 (GA), CSR-12254 (TX),
LCR-991 (TN)

22 FILE NO. 628319

1 April 17, 2026

2 9:08 a.m.

3
4 Stenographic deposition of
5 ROBERT M. KIMMEL, SC.D., held at the
6 offices of Finnegan, Henderson, Farabow,
7 Garrett & Dunner, LLP, 271 17th Street,
8 N.W., Atlanta, Georgia before Tanya L.
9 Verhoven-Page, Certified Court Reporter
10 (GA), Licensed Court Reporter (TN) and
11 Certified Shorthand Reporter (TX).
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I N D E X

WITNESS: ROBERT M. KIMMEL, SC. D.

Examination	Page
BY MR. COLLINS-CHASE	7

EXHIBITS INDEX:

Kimmel Deposition Exhibit	Description	Page
Exhibit 1001	United States Patent Patent Nos. US 11,648,090 B2 US 11,648,091 B2 US 10,973,613 B2	113
Exhibit 2014	Declaration of Robert M. Kimmel, Sc.D.	10
Exhibit 2015	Curriculum vitae of Robert M. Kimmel, Sc.D.	22

(Kimmel Deposition Exhibit Nos.
1001, 2014 and 2015 were identified for
the record. Exhibits will not be
attached to the transcript.)

1 ATLANTA, GEORGIA; FRIDAY, APRIL 17, 2026

2 9:08 A.M.

3
4 Thereupon --

5 ROBERT M. KIMMEL, Sc.D.,
6 called as a witness, having been first duly sworn,
7 was examined and testified as follows:

8
9 EXAMINATION

10 BY MR. COLLINS-CHASE:

11 Q Good morning, Dr. Kimmel. How are you?

12 A Good morning.

13 Q Could you please state your full name for
14 the record.

15 A Robert M. Kimmel.

16 Q Thank you. We met earlier, but my name
17 is Charles Collins-Chase. I'll be asking you some
18 questions today.

19 Dr. Kimmel, have you ever had your
20 deposition taken before?

21 A Yes, I have.

22 Q How many times?

1 A I don't know. Twenty -- 26, 27, 28,
2 something like that. It's in my CV.

3 Q Do you understand that you're here today
4 to provide testimony under oath?

5 A Yes.

6 Q And you understand that you're expected
7 to tell the truth with your testimony?

8 A Yes.

9 Q Is there any reason that you should not
10 be able to provide complete and accurate testimony
11 today, Dr. Kimmel?

12 A No.

13 Q Dr. Kimmel, I know you've been deposed
14 many times so you probably know the rules, but just
15 to go over a couple of them.

16 If you don't understand any of my
17 questions, please let me know if you don't understand
18 it, and if you don't tell me otherwise, I will assume
19 that you understand the question.

20 Is that okay?

21 A Yes.

22 Q If you need a break at any time, please

1 let me know. This is not a forced march. We can
2 take a break at any time that you need to. If we're
3 in the middle of a question and answer, I'd ask that
4 we finish that before we take a break, but really,
5 please let me know if you need to take a break and
6 I'm happy to do that.

7 A I understand.

8 Q Dr. Kimmel, is it your understanding that
9 you are here today to testify regarding your
10 declaration that was submitted in four inter partes
11 review proceedings at the U.S. Patent and Trademark
12 Office?

13 A That's my understanding.

14 Q Dr. Kimmel, do you have any papers with
15 you today that you brought in?

16 A No.

17 Q Okay. So we can give you a copy of the
18 declaration that you submitted in the case. Here you
19 are, sir.

20 A Thank you.

21 MR. COLLINS-CHASE: And I have
22 copies for you guys, too, if you need

1 any.

2 MR. ROSATO: Thanks.

3 BY MR. COLLINS-CHASE:

4 Q Dr. Kimmel, is this the declaration that
5 you submitted in the IPR proceedings we just
6 mentioned?

7 A It appears to be, yes.

8 Q And those are, for the record, IPR
9 2025-00818, IPR 2025-000819, IPR 2025-00820 and IPR
10 2025-00821.

11 Do you see that?

12 A Yes.

13 Q Did you submit the same declaration with
14 the same text for all four of those proceedings?

15 A I just wrote one declaration.

16 (Kimmel Deposition Exhibit No. 2014
17 was identified for the record.)

18 BY MR. COLLINS-CHASE:

19 Q Perfect. Dr. Kimmel, is it your
20 understanding that the patents that are at issue in
21 those IPR proceedings are the four patents that are
22 listed on the front page of your declaration, Exhibit

1 2014?

2 A That's my understanding.

3 Q Okay. Could you please turn to the last
4 page of Exhibit 2014. And then I think if we go
5 backwards two pages, 95, so the last page of text of
6 your declaration, is that your signature, sir?

7 A Yes, it is.

8 Q Dr. Kimmel, did you write this
9 declaration yourself?

10 A No. I wrote it in cooperation with the
11 attorneys.

12 Q Did you review the entire substance of
13 the declaration to ensure that you agreed with all
14 the statements in the declaration?

15 A Before I put my signature on it, I made
16 sure I agreed with everything.

17 Q Dr. Kimmel, have you reviewed the patent
18 owner response that Align filed in these IPR
19 proceedings?

20 A No, I have not.

21 Q Dr. Kimmel, would you please turn to
22 Paragraph 39 of your declaration. And it's on Page

1 21, if that's helpful. Take a moment and read
2 Paragraph 39, if you need to, and let me know when
3 you're ready.

4 A I've read it.

5 Q The paragraph, 39, says: Dr. Osswald has
6 provided a description of the person of ordinary
7 skill for each of the multilayer appliance patents.

8 And then you reproduce Dr. Osswald's
9 definition of a person of ordinary skill in the art.

10 Do you see that?

11 A Yes.

12 Q Do you agree with Dr. Osswald's
13 definition of the person of ordinary skill in the
14 art?

15 A My comments on Dr. Osswald's description
16 are in Paragraph 41. And I can summarize it, I can
17 read it, whichever.

18 Q Yeah. So you pointed to Paragraph 41 of
19 your declaration, and you say: In this declaration,
20 I apply a level of skill in the art not lower than
21 the standard adopted by Dr. Osswald.

22 Do you see that?

1 A Yes.

2 Q So did you apply the same level of
3 ordinary skill in the art as Dr. Osswald or a
4 different one?

5 A No. I applied the same level of skill in
6 the art, but my comment was that -- that he doesn't
7 require a POSITA to have an understanding of
8 experience with the design, manufacture and
9 processing of thermoformable polymer sheets for use
10 in orthodontic or dental appliances.

11 So I felt it was important to have some
12 of that information. I don't have it by my work
13 experience, but I have it by depending and relying on
14 the declaration that was filed by Ms. Chen in this
15 case.

16 Q When you say, "I don't have it by my work
17 experience," you mean that you don't have experience
18 through your work in the design, manufacture and
19 processing of thermoformable polymer sheets for use
20 in orthodontic and dental appliances?

21 A That's correct.

22 Q Do you have any experience designing or

1 manufacturing a dental appliance?

2 A No, I don't.

3 Q Do you have any experience in performing
4 clinical trials?

5 A Not in performing them. I think I've
6 been in a clinical trial at one point in time.

7 Q As a patient?

8 A As a patient, but --

9 Q Understood. Dr. Kimmel, you do not have
10 any experience measuring tooth movement, correct?

11 A I do not.

12 Q Dr. Kimmel, you said you relied on the
13 declaration that was filed by Yen Chen in this case?

14 A Yes.

15 Q Did you speak with Ms. Chen?

16 A I did not.

17 Q You reviewed her declaration during the
18 time that you were preparing your own declaration
19 with your attorneys?

20 A I did.

21 Q Dr. Kimmel, if you would please turn to
22 Paragraph 8 of your declaration, which is on Page 4.

1 You state that from 2004 until your retirement you
2 taught the Capstone course of the Packaging Science
3 Curriculum, Package Design and Development.

4 Do you see that?

5 A Yes.

6 Q Over the last 22 years or so, has the
7 focus of your work been on package design and
8 development?

9 A Well, the last part of my career, I was
10 teaching in the Packaging Science Department at
11 Clemson. And so, naturally, it was -- a lot of the
12 work was focused on teaching and -- and doing
13 research and guiding research in the area of package
14 development and materials for package development.

15 So a lot of it was -- it was based on my
16 expertise, which is really materials, the materials
17 side of development. The packaging is an extremely
18 broad field, demanding skills in a lot of different
19 areas. It is one of the broadest fields -- well,
20 it's a very broad field. And within the department
21 we had specialists in a lot of different areas of
22 that field.

1 My responsibility -- my responsibilities
2 focused on the use of plastics in packaging.
3 Plastics have been my entire -- my entire career.
4 You know, at this point it's well over 60 years of
5 experience working with polymers and plastics. And
6 so -- but in this -- in this course, it gave me the
7 opportunity to really broaden my scope because -- to
8 really guide these -- these projects that the
9 students work on.

10 So in this course, students work on -- in
11 teams, you know, for a whole semester on a project, a
12 lot of them sponsored by companies. And they could
13 be anything. You know, package water, package
14 microphones, you know, and everything in between. We
15 did one packaging, 10-ton copper -- big copper -- I
16 don't know, big copper cylinders, I guess. I don't
17 even remember the application. I just happen to
18 remember there were 10 tons of copper, and the issue
19 was how you transport those.

20 So there's issues, you know, on a very
21 micro scale when you're talking about -- you're
22 talking about packaging medical devices and -- which

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1 we did quite a bit of, and issues on a very macro
2 scale. So it's very broad. And so the benefit to me
3 mentoring this course was it greatly broadened my
4 scope and my expertise in the kinds of things I had
5 to learn in order to guide the students. You know,
6 it was an area that was outside my specialty, you
7 know. I had to develop some expertise in order to
8 guide them.

9 Q When you say it was outside your
10 specialty, what specialty are you referring to?

11 A My specialty is polymers and plastics.
12 And -- but, you know, almost all of these projects
13 involved corrugated and designing with corrugated.
14 Because, as we all know, you know, corrugated boxes
15 are the outside of most of these packages. If you're
16 going to ship something, you usually put it in a
17 corrugated box. And so, you know, I learned a lot
18 about corrugated, I learned a lot about paperboard.
19 I learned about the issues in designing for
20 transportation. It was just -- it was a very
21 broadening experience, which I enjoyed tremendously.
22 So --

1 Q You mentioned, Dr. Kimmel, that the
2 packaging field is very broad and requires skill in
3 many different areas.

4 What areas are you referring to?

5 A So fundamentally it involves, first of
6 all, skills in a variety of materials. It involves
7 skills in how to form those materials into
8 containers. It involves the -- once you've formed
9 the material, it involves, particularly in many areas
10 of packaging, an understanding of how the products in
11 those packages are going to interact with the
12 environment.

13 And -- and then the whole issue is
14 involved in designing for transportation, which is --
15 you know, it's -- it's very heavily rooted in
16 mechanical engineering, but it's still -- and, you
17 know, we have -- we had laboratories -- we have
18 laboratories at Clemson to do all of those, to work
19 in all of those fields, because the students were
20 training and going to go out and work in all of those
21 fields.

22 And one of the benefits of an education

1 in packaging science is they can work -- develop in
2 the lab developing materials or they can go work in
3 marketing or purchasing or sales. And so our
4 students go out to all of these different areas, but
5 they have to have a fundamental understanding of what
6 goes into designing and using the package that works.
7 Packages are very functional things. We don't -- you
8 know, the ordinary person never thinks about it.
9 Right? We take packaging for granted. But, in fact,
10 it's a very detailed, very scientifically rooted
11 field.

12 Q All those skill areas that you mentioned
13 have applicability within the packaging field
14 specifically, right?

15 A Well, a lot of them overlap with -- I
16 mean, when you're talking about using -- about
17 developing and using particularly plastic materials,
18 the same sorts of skills and understanding applies to
19 making other plastic articles that aren't packaging,
20 that are -- that are -- that are, you know, liners,
21 even.

22 So the thermoforming process for liners

1 is really no different than the thermoforming process
2 for making a medical device package. It's the
3 basic -- same basic technology. So there's --
4 it's -- we're taking -- we're taking from all kinds
5 of different fields and applying them to a specific
6 application.

7 But those of us working in the field, you
8 know, have expertise that goes well beyond -- I mean,
9 I spent 30 years of my career in the plastics film
10 and plastic resin industry before I went to Clemson.
11 So, you know, the -- yeah.

12 Q Much of your experience before Clemson
13 was still in the packaging area, though, correct?

14 A No. Not necessarily. Packaging was just
15 one market that we serviced.

16 So I worked in a company that was making
17 polyester resins and films. So that means the resins
18 to make these plastic bottles that we're all very
19 familiar with and are the subject of much angst
20 because we don't know how to dispose of them. But
21 that's a different subject.

22 But the film applications ranged from

1 applications which don't even exist anymore,
2 microfilm, computer tape, HUD stamping foil, as well
3 as packaging. So packaging is about -- I don't
4 know -- 20 or 25 percent of the polyester film market
5 and we serviced all of those. I worked -- I worked
6 in many of those applications over the course of 30
7 years.

8 Q Dr. Kimmel, you just referred to the
9 plastic water bottle that's sitting on the table in
10 front of you. What polymer is used to make that
11 water bottle?

12 A That's poly -- it's PET, polyethylene
13 terephthalate.

14 Q What class of polymers is PET?

15 A It's a condensation polymer.

16 Q Have you worked with other polymers in
17 your packaging experience besides PET?

18 A Many, yeah, almost, yeah. I mean, the
19 largest polymer used in packaging is actually
20 polyethylene, so.

21 Q Have you worked with PVC?

22 A Yes.

1 Q Polycarbonate?

2 A Yes.

3 Q HTPE?

4 A Yes.

5 Q LDPE?

6 A Yes.

7 Q PETG?

8 A Yes.

9 Q Are there any others that you spent a lot
10 of time working on that I haven't mentioned?

11 A Yeah. I did a lot of work with
12 high-temperature plastics that are capable of
13 sustaining high temperatures, and we don't -- yeah.

14 Q Polystyrene? I forgot that one.

15 A Yes.

16 (Kimmel Deposition Exhibit No. 2015
17 was identified for the record.)

18 BY MR. COLLINS-CHASE:

19 Q Dr. Kimmel, I'll hand you your CV so you
20 can have it for a couple questions that I'm going to
21 ask you. And this is Exhibit 2015.

22 MR. ROSATO: Thank you.

1 BY MR. COLLINS-CHASE:

2 Q Dr. Kimmel, is Exhibit 2015 an accurate
3 copy of your CV?

4 A It appears to be, yes.

5 Q Is this your standard CV that you use or
6 one that was prepared for the purposes of these
7 proceedings?

8 A No, it's a standard CV. I mean, I
9 updated it for the purposes of these proceedings, and
10 I'm constantly updating it of course.

11 Q That was my question.

12 It's updated as of the date that you
13 submitted your declaration?

14 A Yes, of course.

15 Q And we talked about your experience since
16 2004. And under the University and Teaching
17 Experience on the first page of Exhibit 2015, it's
18 got a position from 2004 to 2022, Director, Center
19 for Flexible Packaging.

20 Do you see that?

21 A Yes.

22 Q What is the Center for Flexible

1 Packaging?

2 A I actually describe that in the
3 biographical section of my deposition, which might be
4 easier to -- to look at that. Let's see. So it's
5 Paragraph 10 on Page 5.

6 So I wrote here: The Center is an
7 academic-industry consortium dedicated to teaching,
8 research and service in flexible packaging. The
9 Center provides the domestic and international
10 packaging industries with a wide range of testing
11 services and prototyping and product development
12 services using cast and co-extruded blown film
13 manufacture, coding, adhesive lamination,
14 thermoforming and a variety of package manufacturing.

15 And I wrote this in the present tense
16 because the Center still exists. It was taken over
17 by the professor who was my associate director.

18 Q You also list experience under University
19 and Teaching Experience from 2006 to 2011, Chair,
20 Department of Packaging Science.

21 Is that the chair of the Department of
22 Packaging Science at Clemson?

1 A Yes.

2 Q What were your roles and responsibilities
3 in your chair position?

4 A Trying to manage a bunch of very
5 difficult people.

6 Q That sounds like most chair positions.

7 A Yeah. It's -- I think a chair position
8 is the worst -- absolutely the worst, the worst
9 position in the university, without question. You
10 can't win. There's absolutely no win.

11 Especially, as I did, if you have
12 individuals who didn't want me to be appointed chair,
13 who included the man who had been dismissed from the
14 chair position because of his conduct. And so, you
15 know, it was constantly -- constantly fighting
16 against me. It was not much fun.

17 But it was a good experience, of course,
18 plus it exposed me to the highest levels of
19 administration at the university. It was very -- it
20 was, in many respects, a good experience, but very,
21 very different from working in industry.

22 Q Were you continuing your research and

1 teaching during the time that you were serving as
2 chair?

3 A To the extent that I could, yeah. I
4 really had to stop a lot of research and -- you know,
5 there was just no time. So I did continue teaching.
6 I continued teaching the course we talked about
7 before, but I gave up the other courses I was
8 teaching.

9 Q You continued teaching the Capstone?

10 A Yes.

11 Q You were the chair until 2011, and your
12 CV lists a position from 2011 through 2022, Director,
13 Packaging Science Program, Department of Food,
14 Nutrition and Packaging Sciences.

15 Do you see that?

16 A Yes.

17 Q What was your role as the director?

18 A So in -- in 2010, 2011, I'm going step
19 down as chair. The administration decided to merge
20 the Packaging Science Department with the Food
21 Science and with -- with the Food Science and Human
22 Nutrition Department, which was next to us, down the

1 hall, because they thought it would be more
2 efficient.

3 And so -- and the gentleman who was
4 brought in to chair that new department was a food
5 scientist, who knew something about packaging
6 science. But we decided that we needed someone to
7 take responsibility and coordinate the activities of
8 the faculty of the Packaging Science Department. So
9 that was my role, was -- was to develop strategic
10 direction and to -- it wasn't -- I didn't have any
11 administrative responsibility for the people, but I
12 did have responsibility for organizing our
13 curriculum, for helping the team make decisions about
14 curriculum and about which students we were going to
15 accept and what we were going to try and do in terms
16 of adding equipment. It was a strategic -- you know,
17 very much a strategic position.

18 And so I did that from -- when I say i
19 was the logical person to do it, I had just been
20 chair of the department, so, and doing a lot of the
21 same things as chair of the department. So, you
22 know, I did that until I retired.

1 Q Before you were at Clemson, you were in
2 industry; is that correct?

3 A That's correct.

4 Q You list a position on the first page of
5 Exhibit 2015, it says, 1999 to present at Reedy River
6 Associates in Roswell, Georgia, President.

7 Do you see that?

8 A Yes.

9 Q What is Reedy River Associates?

10 A That's just the name for the company
11 under which I do consulting. I set it up as soon as
12 I left -- as soon as I left industry and I could
13 start doing consulting, you know, which is, of
14 course, an encouraged activity for faculty. So I
15 just -- if you know Greenville, you know what the
16 Reedy River is.

17 Q So the consulting company Reedy River
18 Associates is the --

19 A It's just a sole proprietorship.

20 Q -- the company name that you have for
21 your consulting work?

22 A Yeah. It's just a company name that I

1 use sometimes. I get a tax number for it.

2 Q That's useful.

3 And you've done consulting to the
4 plastics and packaging industries from 1999, when you
5 left industry, during your time at Clemson; is that
6 right?

7 A Until now, yes.

8 Q Are you still engaging in consulting to
9 the plastics and packaging industries?

10 A I still engage in -- yeah, I still engage
11 in consulting in the form of expert witness work. I
12 don't do -- I don't do much technical -- pure
13 technical consulting anymore, but I do -- I continued
14 doing, you know, legal-related work or whatever,
15 expert witness kind work, consulting with law firms.

16 Q What position did you hold before you
17 left industry?

18 A Well, that's what's the next item here.
19 Right?

20 So from '94 to '98, I ran a team doing
21 new business development in the -- you know, in the
22 areas that are outlined on the CV. So I had a

1 multifunctional team of people, and we were working
2 on developing new products based on -- based on the
3 company's plastics technology. And we were very
4 successful.

5 In fact, at this same time, Hoechst was
6 going through a whole reorganization and, you know,
7 they ended up -- in 1998 they closed a lot of
8 activities and became a pharmaceutical company. And
9 the -- which is why I retired, because they -- they
10 took a lot of their activities in the U.S. and just
11 said, well, we don't need you anymore. And I was
12 fortunate, but it was a good time for me to retire
13 from industry.

14 Q During that period --

15 A Which is when I went to Clemson, so.

16 Q Understood. During that period from 1994
17 through 1998 that you mentioned, was your work
18 focused on plastics for packaging?

19 A Actually not. Packaging was only one --
20 was only one application. So we were -- we were
21 working on multilayer films and we had
22 state-of-the-art equipment for co-extruding

1 multilayer films. And we were concerned with a
2 particular polymer that Hoechst Celanese had in its
3 portfolio that we learned how to make into films and
4 into multilayer films.

5 It had a very unique set of properties,
6 and we were looking for all kinds of applications for
7 it. We looked at -- we worked on printed circuit
8 boards, we worked on gas tanks, as well as -- as well
9 as packages. And the -- during that time, we worked
10 on -- it was the -- really the beginning interest in
11 plastic beer bottles, which had very special barrier
12 requirements, and we thought our material might be
13 applicable to that. We did a lot of work with Miller
14 Beer.

15 So it was a very wide-ranging set of
16 applications.

17 Q There were packaging applications --

18 A Yeah, there were --

19 Q -- in your work in that role?

20 A -- packaging applications, there were
21 non-packaging applications.

22 Q Were all the packaging applications you

1 were working on food packaging?

2 A No.

3 Q What other types of packaging?

4 A Well, as I said, there was -- you know,
5 we worked on packages. Well, as I said, the packages
6 for beer. I guess that's food, to some people
7 anyway. And we worked on -- we worked on fuel
8 additive containers. You know, all kinds of things
9 that need to be packaged and need good barrier
10 properties.

11 Q Any dental applications?

12 A I don't remember correctly.

13 Q You don't recall working on any dental
14 applications?

15 A I don't recall, no.

16 Q And you don't list any dental
17 applications on that part of your CV?

18 A No. It certainly wasn't a major part of
19 our work.

20 Q And you don't remember that it was a part
21 of your work?

22 MR. ROSATO: Objection to form.

1 THE WITNESS: It could have been.
2 We could have had some applications. We
3 worked on a lot of different things.

4 Because we were looking for -- I
5 mean, we had this -- had this material
6 that we had a proprietary position in
7 that had very unique properties, and we
8 were trying to develop ways for the
9 corporation to take advantage of this
10 technology and make some money on it. So
11 we were looking for all kinds of
12 applications.

13 BY MR. COLLINS-CHASE:

14 Q If we go back one position on your CV,
15 1991 through 1994, it says, Department Head, New
16 Films Business Development.

17 Do you see that?

18 A Yes.

19 Q What types of films were you working on
20 in that role?

21 A So I spent those three years in Germany
22 and managing a team -- I don't know -- it was about

1 20 people, I guess, and we were responsible for
2 research for all of the miscellaneous films that
3 Hoechst had. .

4 Hoechst was a major chemical company that
5 had all kinds of products. The big films they made
6 were polyester and polypropylene, and to some extent
7 cellophane. And -- but they were interested in all
8 kinds of other things, high-temperature films. And
9 so my group was doing research supporting all
10 these -- all these different -- all these different
11 films, film applications, and it was a very
12 interesting time.

13 Q Going back one more position from, 1987
14 to 1991, it says you were Business Manager, Packaging
15 and Specialty Films.

16 Do you see that?

17 A Yes.

18 Q Was the focus of your work as a business
19 manager different from when you were the department
20 head of new films business development?

21 A Oh, very different.

22 Q What was the focus of your work as a

1 business manager?

2 A Well, I was running a business. So it
3 ended up -- by the time I left it, it was about a
4 \$50 million business, and I was really responsible
5 for -- I didn't have administrative responsibility
6 for all of that, but I had strategic direction and
7 coordination between manufacturing and R&D and sales
8 and marketing, you know, for applications in, as I
9 say, packaging and specialty films. And specialty
10 films includes a whole bunch of non-packaging
11 applications for polyester film.

12 So it was a business management thing,
13 heavily oriented towards marketing, but I interacted
14 with a lot of customers. And in order to enable our
15 work, as it's noted here, we justified and installed
16 a \$2 million application laboratory that did things
17 like heat set lamination and extrusion lamination,
18 and so we had the equipment to do that.

19 We did -- we were doing a lot of work in
20 what our customers would do with our films. So we --
21 so we sold this film which had special properties,
22 but we had to teach the customers how to use it, and

1 the best way to do that was to actually do the work
2 ourselves. So we invested in the equipment and it
3 was extremely successful. So, yeah.

4 Q In your position before that, Process
5 Research Manager, Polyester Films, from 1985 to 1987,
6 you were also, I assume, working on polyester films?

7 A Yes, this was all under the -- I was
8 working in the polyester films business, but it
9 was -- by that time it was polyester film and
10 polyester resin.

11 So -- yeah, so that was a -- that was
12 really a development position. You know, one of
13 those things that happens in industry. Right? So,
14 you go work here for a few years, you need to do
15 that. And so that was part of the R&D organization.

16 We had a -- one responsibility was the --
17 our pilot line for making polyester film. I mean, I
18 had a big department because I had -- I had enough
19 operators who were running that pilot line 24/7, plus
20 then a research team who was doing process research
21 rather than product research. And -- and I was --
22 also had an engineering design group who was doing

1 all the design work for everybody in the R&D
2 organization.

3 So it was -- it was a good learning
4 experience.

5 Q Dr. Kimmel, to avoid having to go through
6 every line of your CV, you have a number of
7 publications and journal articles and the like that
8 you list in your CV, right?

9 A Yes.

10 Q Are the subject areas of your
11 publications primarily in the area of polyester films
12 and packaging?

13 A Oh. No, not necessarily -- well, I mean,
14 I didn't publish very much on polyester films because
15 all the research work we were doing in the company
16 was proprietary research. You know, we didn't
17 publish. The researchers wrote a lot of patents, but
18 we weren't publishing articles.

19 And these -- the patents were -- so
20 the -- and so, you know, most of the publications, at
21 least on Page 4, were, you know, work that I did with
22 graduate students, and it's a very broad range of

1 things. Most of them -- I mean, these are all
2 packaging science department, so they were somehow
3 related to packaging.

4 But, you know, it's very wide-ranging
5 things. But, I mean, everything from -- from how you
6 can put something in a package and send it off in a
7 truck and have a record of what happened to it, you
8 know, to all kind of things. It's just a very wide
9 range of things because, of course, I was working
10 with other faculty members and helping -- helping
11 their graduate students. You know, a typical
12 academic sort of thing.

13 And then on Page 5, those are all --
14 yeah, so after the first -- after the first four, the
15 rest of them were all publications that resulted from
16 my -- my two theses and my dissertation.

17 Q And you're referring to the publications
18 on Page 5 of Exhibit 2015 --

19 A On Page 5.

20 Q That have --

21 A Yes.

22 Q -- dates ranging from 1964 through 1971

1 or so; is that right?

2 A Yes, that's correct.

3 Q And those were publications associated
4 with your own --

5 A That was my own --

6 Q -- academic research when you were a
7 student?

8 A Academic research, yeah, yeah. And then
9 the other four -- I mean, so -- the first -- the
10 second -- the second and third on that page were kind
11 of review articles I was asked to write. The fourth
12 one related to the first projects I did when I went
13 to industry when I was in central research. I was
14 working on graphite fiber development. It was the
15 beginnings of developing carbon fibers, and we wrote
16 and presented what's still regarded as a very
17 important paper.

18 So, you know, you do a lot of things in a
19 long career.

20 Q You don't list any publications relating
21 to dental or orthodontic applications, do you?

22 A No, I don't.

1 Q You list additional publications,
2 proceedings published with oral presentations, et
3 cetera, on Pages 5, 6 and 7 of Exhibit 2015?

4 A Yeah.

5 Q There aren't any dental proceedings or
6 publications or presentations, are there?

7 A I don't think so. No.

8 Q And the same with book chapters, there's
9 no book chapters on dental or orthodontic
10 applications?

11 A No.

12 Q Dr. Kimmel, is it your position that even
13 though your academic and industry experience is in
14 polymers and with a specialty in packaging, it's
15 nonetheless representative of the skills and
16 experience that one would have working with polymers
17 that would be used for dental appliances?

18 MR. ROSATO: Objection to form.

19 THE WITNESS: Yes.

20 BY MR. COLLINS-CHASE:

21 Q How does your background in polymers and
22 packaging make you qualified to opine on patent

1 claims that talk about dental appliances?

2 A Because the patent claims I'm opining on
3 have to do with the structure of how you put those
4 aligners together, which is taking different polymer
5 films and creating them and thermoforming them. And
6 those are standard plastics processes that I did,
7 that -- you know, that permeated my whole career and
8 my academic training.

9 Q Dr. Kimmel, for some level setting, we're
10 talking today a lot about polymers, what is a
11 polymer?

12 A A polymer -- yeah. Polymers are long
13 chain molecules made up of monomers, individual
14 chemical species, that are linked together in long
15 chains.

16 Q What is a homopolymer?

17 A A homopolymer is made up of one type of
18 monomer.

19 Q And what is a copolymer?

20 A Something made up of more than one type
21 of polymer -- of monomer.

22 Q Are there different classes or categories

1 of copolymers?

2 A Yes. Many.

3 Q What are some of the categories of
4 copolymer?

5 MR. ROSATO: Object to form and
6 foundation.

7 THE WITNESS: Yeah, I mean, I
8 didn't cover that in my declaration. You
9 know, there must be six or seven or eight
10 different kinds of copolymers. I'm not
11 sure I could even list them all off the
12 top of my head.

13 BY MR. COLLINS-CHASE:

14 Q Are you familiar with the block
15 copolymer?

16 A I am.

17 Q What is a block copolymer?

18 A It's just what it says. The monomers
19 appear in blocks along the chain.

20 Q When you say they "appear in blocks,"
21 what is a block?

22 A A block is -- there's a group of one type

1 of monomer, then a group of another type of monomer
2 of significant enough length that its properties are
3 important. So AAAA, BBBB, AAAA, BBBB.

4 Q What's an alternating copolymer?

5 MR. ROSATO: Object to form and
6 foundation.

7 BY MR. COLLINS-CHASE:

8 Q I'll ask it this way.

9 Are you familiar with something called an
10 alternating copolymer?

11 A Yeah, I mean, it's well beyond the scope
12 of anything I wrote about.

13 Q You mentioned a block copolymer AAAA,
14 BBBB, AAAA, BBBB.

15 Did I get that right?

16 MR. ROSATO: Object to form.

17 THE WITNESS: With -- there was
18 nothing -- nothing important about the
19 number of As or number of Bs.

20 BY MR. COLLINS-CHASE:

21 Q Understood. So is alternating A, B, A,
22 B, also a block copolymer?

1 MR. ROSATO: Objection to form,
2 foundation.

3 THE WITNESS: Block means there's a
4 significant length of those individual
5 monomer species.

6 BY MR. COLLINS-CHASE:

7 Q Understood. Does that differentiate it
8 from a copolymer where it alternates A, B, A, B and
9 you don't have greater length of A or a greater
10 length of B before switching?

11 MR. ROSATO: Object to form and
12 foundation.

13 THE WITNESS: Yeah, I mean, we're
14 getting well beyond anything that I've
15 talked about here in my declaration, you
16 know.

17 BY MR. COLLINS-CHASE:

18 Q Do you know the answer?

19 MR. ROSATO: Objection. Asked and
20 answered.

21 THE WITNESS: Yeah, I think I
22 answered your question, but I -- I think

1 it's an inappropriate for me to go any
2 further because you're going beyond the
3 scope of what's in my declaration.

4 BY MR. COLLINS-CHASE:

5 Q You talk about the term "copolymer" in
6 your declaration, right?

7 A I'm sure I must, yes.

8 Q So I'm just trying to understand what you
9 understand the boundaries of that term to be.

10 So my question was, if you have
11 alternating monomers A, B, A, B, that's a copolymer,
12 right?

13 MR. ROSATO: Objection to form and
14 foundation.

15 THE WITNESS: Well, maybe it would
16 be appropriate to look at my declaration
17 where I talked about that subject,
18 because I think I was very specific. I
19 think it's in Paragraph 50 on Page 26.

20 BY MR. COLLINS-CHASE:

21 Q Okay. And what part of Paragraph 50 are
22 you pointing to, Doctor?

1 A Well, it's right at the beginning: A
2 copolyester is a copolymer form of a polyester which
3 means that it is formed of two or more different
4 kinds of polyester monomer.

5 Q Okay. And so my question was, if you
6 have monomers A and B alternating A, B, A, B, is that
7 a copolymer?

8 MR. ROSATO: Objection to form.
9 Outside the scope of direct.

10 THE WITNESS: Yeah, I don't -- I
11 don't specifically deal with that issue
12 here because it's -- it's -- you know, I
13 didn't think it was relevant to this.
14 That's not here. So I'm going to leave
15 it at that.

16 BY MR. COLLINS-CHASE:

17 Q So you don't know whether alternating
18 monomers A, B, A, B would make the polymer a
19 copolymer?

20 MR. ROSATO: Object to form. Asked
21 and answered.

22 THE WITNESS: Whether I -- sorry.

1 Whether I know or not isn't the issue.

2 The issue is it's not -- it's not in my
3 direct testimony.

4 BY MR. COLLINS-CHASE:

5 Q So in Paragraph 50, you use the term
6 "copolymer," right?

7 A Yes.

8 Q And I'm trying to understand, when you
9 use the term copolymer, what the definition of that
10 term is for you as used in Paragraph 50.

11 A The first sentence defines it.

12 Q I believe the first sentence defines a
13 copolyester. It says: A copolyester is a copolymer
14 form of a polyester, which means it's formed of two
15 or more different kinds of polyester monomers.

16 You would agree that that's not a
17 definition of a copolymer generally, right?

18 MR. ROSATO: Object to form.

19 THE WITNESS: Substitute anything
20 else for polyester and it's a general
21 definition. It's -- a copolymer is a
22 form of a polymer, which means that it's

1 formed of two different kinds of
2 monomers.

3 BY MR. COLLINS-CHASE:

4 Q Does it matter what order those monomers
5 appear in the polymer as to whether it is classified
6 as a copolymer?

7 A I haven't addressed that issue.

8 Q Well, you just gave what you said was a
9 general definition of copolymer, which is a term that
10 you used in Paragraph 50.

11 So I'm trying to understand, in that
12 definition, when you say "formed of two or more
13 different kinds of monomers," whether that definition
14 requires any particular arrangement of those monomers
15 in the polymer structure.

16 So if you could answer that, please?

17 MR. ROSATO: Object to form.

18 THE WITNESS: The implication of
19 this sentence and certainly what I meant
20 is that a copolymer is formed of two or
21 more different kinds of monomers.

22

1 BY MR. COLLINS-CHASE:

2 Q Full stop?

3 A Full stop.

4 Q What is a polyester?

5 A A polyester is a condensation polymer --
6 let's see. I don't know if I put that in here or
7 not. Well, I think it's in here someplace. I'm not
8 sure.

9 A polyester is a condensation polymer
10 formed by a diacid and a diol reacted together and
11 then polymerized into a polymer. At which --
12 Dr. Osswald wasn't able -- an answer Dr. Osswald was
13 not able to provide correctly.

14 Q If you make a polyester from a diol and
15 both the first diacid and a second diacid, does that
16 it make it a copolyester?

17 MR. ROSATO: Object to the form.

18 Foundation, scope.

19 THE WITNESS: Well, if you look at
20 the definition I provided in 50, it's two
21 or more different kinds of polyester
22 monomers. The polyester monomer is, like

1 the picture in 8, the -- the diol and the
2 diacid reacted together.

3 If you add two different diols or
4 two different diacids, then it would be a
5 copolymer.

6 BY MR. COLLINS-CHASE:

7 Q It's the existence of either two of the
8 diols or two of the diacids that makes it a
9 copolyester instead of just a regular copolyester; is
10 that right?

11 A Two or more.

12 Q Two or more?

13 A Yeah, I mean, so there is -- yeah, two or
14 more.

15 Q Okay. And you mentioned Paragraph 50. I
16 think you do address this in Paragraph 49, if that's
17 helpful. The --

18 A Oh, yeah. That's what I was looking for,
19 yeah.

20 Q I found it. So -- sorry. To rephrase.
21 So if you have two diols with different
22 structures or two diacids with different structures

1 in your polymerization, that's a copolyester?

2 A Yes.

3 MR. ROSATO: Object to form and
4 foundation.

5 THE WITNESS: And that's what's
6 stated in 49.

7 BY MR. COLLINS-CHASE:

8 Q Dr. Kimmel, you pointed to part of
9 Paragraph 49 on Page 25 of your declaration where it
10 talks about the -- what a polyester is. At least I
11 think you pointed to this portion. It says: A
12 polyester is a polymer formed of repeating monomer
13 units, with each monomer formed from the reaction of
14 a dicarboxylic acid, paren, or an esterified
15 dicarboxylic acid, closed paren, and a diol.

16 Do you see that?

17 A Yes.

18 Q That's not the only way that you can make
19 a polyester, is it?

20 MR. ROSATO: Object to form and
21 foundation.

22 THE WITNESS: Yeah, I mean, I don't

1 address that issue in what I've written
2 here. You know, I suppose there are
3 different ways of coming up with -- with
4 the monomer, but you've still got to make
5 a monomer that contains both species,
6 both monomer species.

7 BY MR. COLLINS-CHASE:

8 Q When you say "both monomer species," what
9 are you referring to?

10 A The diol and the diacid or the esterified
11 acid.

12 Q You could make a polyester by performing
13 a ring-opening polymerization of a cyclic structure,
14 couldn't you?

15 MR. ROSATO: Object to form,
16 foundation and scope.

17 THE WITNESS: I mean, there are
18 ring-opening polymerizations, but it
19 doesn't change the fact that you still
20 have to have an ester linkage in there.
21 That's what makes it a polyester.

22 BY MR. COLLINS-CHASE:

1 Q You said an ester linkage?

2 A Uh-huh.

3 Q The ring-opening polymerization to make a
4 polyester would be different in terms of the setup
5 compared to a process where you were adding a diol
6 and a diacid together, right?

7 MR. ROSATO: Objection. Form,
8 foundation and scope.

9 THE WITNESS: I haven't addressed
10 that in my declaration.

11 BY MR. COLLINS-CHASE:

12 Q In your declaration, in Paragraph 49, you
13 give a definition of a polyester, correct?

14 A Yes.

15 Q You state that: Each monomer is formed
16 from the reaction of a dicarboxylic acid or an
17 esterified dicarboxylic acid and a diol.

18 Right?

19 A Yeah.

20 Q In a ring-opening polymerization to
21 create a polyester, the monomers are not being formed
22 from the reaction of a dicarboxylic acid or an

1 esterified dicarboxylic acid and a diol, are they?

2 MR. ROSATO: Object to form,
3 foundation.

4 THE WITNESS: I haven't addressed
5 that question.

6 BY MR. COLLINS-CHASE:

7 Q You've given a definition, and I'm asking
8 you whether that definition is complete. So I'll ask
9 my question again.

10 In a ring-opening polymerization to
11 create a polyester, the monomers are not being formed
12 through the reaction of a dicarboxylic acid or an
13 esterified dicarboxylic acid and a diol, are they?

14 MR. ROSATO: Object to form. Asked
15 and answered.

16 THE WITNESS: Yeah, I just haven't
17 addressed the whole issue of ring-opening
18 polymerizations in this -- in my
19 declaration and --

20 BY MR. COLLINS-CHASE:

21 Q Is it that you can't answer the question
22 or you're choosing not to answer the question?

1 MR. ROSATO: Object to form.

2 THE WITNESS: I understand that I
3 can answer questions about what I've
4 written and that anything beyond
5 what's -- what I've commented under the
6 declaration is -- is a subject I
7 shouldn't discuss because I haven't
8 provided the background for it in my
9 declaration.

10 BY MR. COLLINS-CHASE:

11 Q Did you consider in drafting the
12 definition of polyester in Paragraph 49 of your
13 declaration whether there were other synthesis
14 pathways besides the one that you mentioned in
15 Paragraph 49?

16 MR. ROSATO: Object to form.

17 THE WITNESS: The -- yeah, my
18 discussion of this subject here was
19 directed towards what's taught in -- to
20 understanding and summarizing what's
21 taught in Tadros, and that was the basis
22 for how I decided to make this

1 discussion. I didn't go beyond that.

2 BY MR. COLLINS-CHASE:

3 Q My question was whether you considered
4 other synthesis pathways for polyesters.

5 Did you consider other synthesis pathways
6 for polyesters when you gave the definition in
7 Paragraph 49?

8 A I considered --

9 MR. ROSATO: Object to form.

10 THE WITNESS: Sorry.

11 MR. ROSATO: Asked and answered.

12 THE WITNESS: I considered the --
13 as I just said, I mean, I considered what
14 was relevant to what I was discussing
15 here. I mean --

16 BY MR. COLLINS-CHASE:

17 Q And so other synthesis pathways for
18 polyesters were not relevant to your discussion, so
19 you did not include them in Paragraph 49?

20 MR. ROSATO: Object to form.

21 THE WITNESS: I included the -- I
22 mean, in my brief description of this

1 technology, I discussed what I thought
2 was relevant to understanding Tadros,
3 which had been put before me and which
4 Dr. Osswald put before us.

5 BY MR. COLLINS-CHASE:

6 Q Sitting here today, you can't say that
7 you did consider other synthesis pathways for
8 polyesters when you drafted this definition in
9 Paragraph 49?

10 MR. ROSATO: Object to form. Asked
11 and answered.

12 THE WITNESS: Yeah, I mean, I've
13 already answered your question three
14 different times. So --

15 BY MR. COLLINS-CHASE:

16 Q I note that we don't actually have an
17 answer to the question of whether you considered
18 other synthesis pathways. You stated that you
19 considered what you felt was relevant and we talked
20 about a specific synthesis route of a ring-opening
21 polymerization that does not have a reaction of a
22 diol and a dicarboxylic acid.

1 I can ask it again, but we don't have an
2 answer to this question. So I'll just say: Did you
3 consider the ring-opening polymerization pathway for
4 making a polyester when you drafted the definition of
5 polyester in Paragraph 49?

6 MR. ROSATO: Object to form. Asked
7 and answered. This is getting to
8 badgering the witness.

9 THE WITNESS: Yeah, as I said --
10 and I'll say it one more time -- I
11 considered what I thought was relevant to
12 the discussion of Tadros.

13 BY MR. COLLINS-CHASE:

14 Q And so you will not answer the question
15 of whether you considered the specific synthesis
16 pathway that I mentioned in your definition?

17 MR. ROSATO: Object to form. Asked
18 and answered.

19 THE WITNESS: I mean, I don't have
20 an answer. I don't even remember.

21 MR. ROSATO: We've been going about
22 an hour, Charles.

1 MR. COLLINS-CHASE: Would you like
2 to take a break, Dr. Kimmel?

3 THE WITNESS: Yeah, that would be
4 good.

5 MR. COLLINS-CHASE: Sure.

6 MR. ROSATO: Thank you.

7 (Brief pause.)

8 THE WITNESS: I'd like to make one
9 comment, which I should have made at the
10 beginning, if I may.

11 There's actually one paragraph in
12 the declaration, Paragraph 142, that on
13 reviewing the final version I realized
14 that it got -- for some reason, it got
15 all confused and it doesn't make any
16 sense. And I'd like to strike that
17 paragraph from the -- from the
18 declaration, if we can do that, because
19 it's -- the way it's written, it's -- I'm
20 not quite sure what happened, but I think
21 some -- some words and sentences got
22 mixed up and --

1 BY MR. ROSATO:

2 Q Well, it's in the declaration. I
3 understand you're noting that there's an issue with
4 the paragraph.

5 What is the issue with the paragraph,
6 Dr. Kimmel?

7 A Just what I said, it doesn't make any
8 sense.

9 Q Right. How does it not make any sense?

10 A Because it --

11 Q You said Paragraph 142, right?

12 A Yeah, 142.

13 Q Okay. Why don't you explain what you
14 mean when you say it doesn't make any sense.

15 A Yeah, so the -- the second and third
16 sentences are inconsistent with the first sentence,
17 and it just -- the -- and, as written, are confusing.
18 The paragraph doesn't say what we wanted it to say.
19 And I'm not sure. It just -- it just escaped me when
20 I read through it, until I read through it just in
21 the last day or so, and --

22 Q So there's no error in Paragraph 142? It

1 just doesn't say what you wanted it to say?

2 A Well, I think there are some --

3 MR. ROSATO: Object to form.

4 Misstates.

5 THE WITNESS: Sorry. I think there
6 are some errors here. I think, you know,
7 polycarbonate maybe should have been some
8 other -- something else and -- because
9 it's just -- yeah. It's -- these
10 sentences don't -- don't reflect what I
11 was trying to say in this paragraph, as
12 written.

13 BY MR. COLLINS-CHASE:

14 Q Okay. Well, maybe we can come back to
15 that. Just, you know, so you know, correcting an
16 error in a thing is usually a word is wrong or
17 something. Striking it is different. That would
18 need to be done through some -- some different
19 procedure, you know.

20 A I leave that to you gentlemen.

21 Q But I understand that you're noting an
22 issue in 142.

1 A That's my intention.

2 Q Dr. Kimmel, before the break, we were
3 talking about polyester and copolyester definitions.

4 Do you remember that?

5 A Yes.

6 Q You mentioned that you worked on plastic
7 water bottles made from PET, right?

8 A Yes.

9 Q Is PET a polyester?

10 A Yes.

11 Q And then you mentioned you worked with a
12 polymer called PETG. Is PETG a copolyester?

13 A Yes.

14 Q We talked for a while about the
15 definition of a copolymer. And you referred to a
16 paragraph in your declaration, Paragraph 50, which
17 you said was something you could turn into a general
18 definition. And I just wanted to make sure that we
19 had your testimony, you know, clean and accurate.

20 The sentence in Paragraph 50 says: A
21 copolyester is a copolymer form of a polyester, which
22 means that is formed of two or more different kinds

1 of polyester monomers.

2 Do you see that?

3 MR. ROSATO: Object to form.

4 THE WITNESS: I think that's what
5 it says, yeah.

6 BY MR. COLLINS-CHASE:

7 Q To make the general definition that you
8 mentioned, I'll try to do that and you can tell me if
9 I got it right or wrong; is that okay?

10 A Okay.

11 Q A copolymer form of a polymer means that
12 it is formed of two or more different kinds of
13 monomers.

14 Do you agree with that?

15 MR. ROSATO: Object to form.

16 THE WITNESS: I think that's what I
17 said before, you know. And the -- and as
18 I also said, you know, the discussion in
19 49 and 50 is relevant to the technology
20 discussed in Tadros. It's not my purpose
21 to give a general dissertation on
22 copolymers.

1 BY MR. COLLINS-CHASE:

2 Q Dr. Kimmel, you mentioned in your
3 declaration cis and trans isomers, right?

4 MR. ROSATO: Object to foundation.

5 THE WITNESS: Yes.

6 BY MR. COLLINS-CHASE:

7 Q What is a cis isomer?

8 A Yeah. So cis and trans are terms that
9 refer to the -- to the stereochemistry of these
10 monomers, and -- and they arise in some cases because
11 carbon atoms have four bonds that can react with
12 other things. And although we draw it on paper in a
13 plane, that's not the real world. The real world is
14 it's three-dimensional and these bonds go off in
15 different directions.

16 And if you have a side group, some side
17 group on -- attached to it and it's -- it's
18 different -- it's different on -- on two adjacent of
19 those bonds, and, for example, with polypropylene,
20 one bond is hydrogen, the other is a CH₃ group. And
21 so if -- if all of the CH₃s point off the molecule in
22 the same direction, that would be cis, okay, and it

1 would result in -- no, I guess that would be -- let's
2 see.

3 Actually, that would be -- I think the
4 cis and trans are confusing, but it would be trans.
5 Okay. It would be -- and we'd call that an isotactic
6 polymer, in the case of polypropylene. If they're on
7 different -- if they -- if they're not all on the
8 same side, then you'd get a cis polymer. And it just
9 has to do with the stereochemistry of the molecule.

10 Q I think that might be backwards. The
11 trans is when they're on opposite sides?

12 Does that sound right?

13 A Yeah, I think that's probably true. I
14 don't know. I -- you know, it's -- yeah, you know,
15 it's funny, I didn't define them in -- in the -- I
16 didn't define them in here. But yes, I think that's
17 right. That's what I started to say at first and I
18 think that is right. Trans is -- yeah. Yeah, right.

19 Q That's okay. If I can summarize.

20 The idea of cis-trans isomerism applies
21 when you have a molecule with the same chemical
22 formula or components, but arranged differently

1 geometrically?

2 A That's a good definition.

3 Q Have you heard cis-trans isomerism
4 referred to as geometric isomerism?

5 MR. ROSATO: Object to form.

6 THE WITNESS: I don't know.

7 Probably. It would be logical.

8 BY MR. COLLINS-CHASE:

9 Q If you have a molecule arranged in the
10 cis configuration and a molecule arranged in the
11 trans configuration, those are structurally different
12 molecules, right?

13 MR. ROSATO: Object to form.

14 THE WITNESS: In terms of their
15 three-dimensional structure, they're
16 different.

17 BY MR. COLLINS-CHASE:

18 Q Can the properties of the molecule differ
19 based on whether it is the cis or the trans isomer?

20 A Yes.

21 MR. ROSATO: Object to form,
22 foundation.

1 BY MR. COLLINS-CHASE:

2 Q If you have a cis monomer and a trans
3 monomer that could be used to make polymer, can the
4 properties of the polymer differ depending on whether
5 you use the cis monomer or the trans monomer to
6 polymerize?

7 MR. ROSATO: Object to form and
8 foundation.

9 THE WITNESS: Yeah, I mean, you're
10 really going beyond the subject in my
11 declaration. But, I mean, as a -- you
12 know, as a general question, yes, it can
13 vary.

14 BY MR. COLLINS-CHASE:

15 Q Dr. Kimmel, would you turn to Paragraph
16 126 of your declaration, please. It's Page 66.

17 A Okay.

18 Q And if you want to look at Paragraph 126,
19 please go ahead. My question is about the part
20 that's on Page -- so on Page 67, but take your time
21 if you'd like to look at the paragraph.

22 A Okay.

1 Q On Page 67 in Paragraph 126, do you see
2 the line starting on -- or the sentence starting on
3 the third line. It says: The specific arrangement
4 of layers used in ST30 aligners is a three-layer
5 configuration with a hard layer formed of a hard
6 copolyester material disposed between two soft layers
7 formed of a soft thermoplastic polyurethane elastomer
8 material.

9 Do you see that?

10 A I see it.

11 Q Dr. Kimmel, this is a yes-or-no question.

12 Do you know what polymers are used to
13 make the three layers of ST30?

14 MR. ROSATO: Object to form.

15 THE WITNESS: The specific
16 information I have is what's in
17 Ms. Chen's declaration, and this is a
18 quote from -- basically a quote from
19 Ms. Chen's declaration.

20 So she -- she talks only about a
21 copolyester material and a -- and a
22 thermoplastic polyurethane elastic

1 material. I don't think she gets -- I
2 don't remember that she gets any more
3 specific than that in her declaration.
4 And so that's -- that's the source of my
5 knowledge.

6 So I guess the answer to your
7 question is you wanted a yes-or-no
8 answer, so the answer to the question is
9 no.

10 BY MR. COLLINS-CHASE:

11 Q Understood. Dr. Kimmel, if you look at
12 Page 68 -- well, I guess it begins on Page 67. So
13 there's a table beginning on 67 and continuing for
14 several pages.

15 Do you see that?

16 A I do.

17 Q The table has a title '613 Patent Claims
18 in the left-hand column and ST30 Aligners in the
19 right-hand column.

20 Do you see that?

21 A I do see that.

22 Q This is a claim chart comparing the '613

1 patent claims to the properties of ST30 Aligners,
2 right?

3 A I would characterize it as comparing the
4 ST30 Aligners to the '613 patent claims. A little
5 bit different.

6 Q If you look on Page 68, the first row
7 under the heading, under the Column '613 Patent
8 Claims, it says: A hard polymer layer comprising a
9 copolyester and having a flexural modulus greater
10 than about 150,000 PSI.

11 Do you see that?

12 A I see that.

13 Q And in the right-hand column, you cite
14 Exhibit 2016, Paragraph 16, right?

15 A Yes.

16 Q That's the declaration by Yen Chen that
17 you mentioned earlier, correct?

18 A Yes, it is.

19 Q Besides the Chen declaration Paragraph
20 16, you don't cite any other evidence to support the
21 ST30 Aligner having the characteristic of a hard
22 polymer layer comprising a copolyester and having a

1 flexural modulus greater than about 150,000 PSI,
2 right?

3 A That's correct.

4 Q Your understanding of the properties of
5 the hard layer come from the Chen declaration, right?

6 A Yes.

7 Q The same question for the next row. And
8 maybe I can avoid reading all the text to you so we
9 don't waste your time. It talks about a soft polymer
10 layer with certain properties.

11 Do you see that?

12 A Yes.

13 Q And then you cite Exhibit 2016, Paragraph
14 17.

15 Do you see that?

16 A Yes.

17 Q So my question is, for the properties of
18 the soft polymer layer, does your knowledge come
19 solely from the Chen declaration?

20 A Yes.

21 Q Okay. Dr. Kimmel, earlier you testified
22 that you had performed co-extrusion processes at some

1 point in your career, correct?

2 A Yes.

3 Q How would someone create a multilayer
4 sheet with co-extrusion?

5 MR. ROSATO: Object to form,
6 foundation, outside the scope of direct
7 testimony.

8 THE WITNESS: Yeah, I mean, I --
9 that's -- that's well beyond what I've
10 talked about here. I mean, you know,
11 co-extrusion comes up only because
12 Dr. Osswald says, I don't like
13 co-extrusion. I want to use -- I want to
14 use adhesive lamination. And he doesn't
15 say why, really. He doesn't back up that
16 statement. And that's where co-extrusion
17 arises, in his declaration, to the best
18 of my recollection.

19 That -- so that -- there was no
20 need for me to undertake a discussion of
21 co-extrusion because he didn't care about
22 co-extrusion. He wanted to use adhesive

1 lamination, and so I spent some time

2 discussing adhesive lamination.

3 BY MR. COLLINS-CHASE:

4 Q In your personal experience of using
5 co-extrusion, did you ever co-extrude a multilayer
6 polymer sheet?

7 MR. ROSATO: Objection to form,
8 foundation, outside the scope of direct.

9 THE WITNESS: I think I already
10 answered that question when we were
11 discussing my CV.

12 BY MR. COLLINS-CHASE:

13 Q And what was the answer?

14 A The answer is yes. I told you we had a
15 state-of-the-art line for making multilayer, multi --
16 state-of-the art co-extrusion line for multilayer
17 films. So, you know, the answer to your question is
18 yes.

19 Q How many layers were in the multilayer
20 film that you were creating using co-extrusion?

21 MR. ROSATO: Object to form.
22 Outside the scope of direct.

1 THE WITNESS: Yeah, you know, it's
2 been a long time. I don't -- I don't
3 specifically remember what the full
4 capabilities of that machine were. Yeah,
5 I don't remember. At least three.

6 BY MR. COLLINS-CHASE:

7 Q Is there any risk of layer delamination
8 when you are making a multilayer sheet using a
9 co-extrusion process?

10 MR. ROSATO: Object to form,
11 foundation, outside the scope of direct.

12 THE WITNESS: Yeah, I -- you know,
13 that's beyond what I've discussed here.

14 BY MR. COLLINS-CHASE:

15 Q You talk about delamination in your
16 declaration, right?

17 A Where do I do that?

18 Q Well, you talk about differences in your
19 opinion between co-extrusion and adhesive lamination;
20 would you agree with that?

21 MR. ROSATO: Object to form.

22 Misstates.

1 THE WITNESS: Could you point me to
2 where that is, please?

3 BY MR. COLLINS-CHASE:

4 Q Yeah. You have a section titled Use of
5 Adhesive Lamination is Not Justified. It's on Page
6 57. So I'm just asking you the general question.

7 You talk about co-extrusion in contrast
8 to adhesive lamination, right?

9 MR. ROSATO: Object to form.

10 THE WITNESS: Yeah. In a quick
11 review of this section, I don't see
12 anyplace in here where I discuss -- I
13 even use the word delamination.

14 BY MR. COLLINS-CHASE:

15 Q Is delamination a risk for co-extrusion
16 processes?

17 MR. ROSATO: Object to form,
18 foundation, outside the scope of direct.

19 THE WITNESS: It's -- it's not --
20 it's not one of the subjects that
21 Dr. Osswald includes in his very brief
22 statement in which he rejects

1 co-extrusion as a way of combining these
2 layers.

3 BY MR. COLLINS-CHASE:

4 Q Dr. Kimmel, do you recall talking in your
5 declaration about bubbles between layers?

6 A Yes.

7 Q And you state that having bubbles between
8 layers could cause the layers to delaminate?

9 Does this refresh your recollection?

10 A Did I give you that?

11 Q Do you recall addressing that in your
12 declaration?

13 A Yeah, I do recall. I was just looking --
14 oh, here we go. It's 116, yeah.

15 Q So that -- delamination.

16 So is delamination a risk in a
17 co-extrusion process?

18 MR. ROSATO: Object to form,
19 foundation, outside the scope, and this
20 has been asked and answered.

21 MR. COLLINS-CHASE: Counsel, he's
22 got delamination. The first times we

1 asked about it, he said he didn't address
2 it in the declaration. So now that we've
3 corrected the record, this is not asked
4 and answered. This is being asked.

5 THE WITNESS: When I read through
6 here, I didn't get to 116.

7 MR. COLLINS-CHASE: That's quite
8 all right.

9 THE WITNESS: Delamination appears
10 in 116, yes.

11 BY MR. COLLINS-CHASE:

12 Q And my question is whether the same
13 delamination is a possibility in co-extrusion.

14 MR. ROSATO: Object to form,
15 outside the scope of direct.

16 THE WITNESS: Yeah, I haven't
17 expressed an opinion about that.

18 BY MR. COLLINS-CHASE:

19 Q So you don't know?

20 A I haven't expressed an opinion about it.

21 MR. ROSATO: Object to form.

22 BY MR. COLLINS-CHASE:

1 Q I understand that. You talk about
2 co-extrusion processes. You compare them to adhesive
3 lamination, which you say has a danger of
4 delamination.

5 So my question is whether co-extrusion
6 has a danger of delamination.

7 MR. ROSATO: Objection. Form,
8 foundation, scope, asked and answered.

9 THE WITNESS: If we look at what I
10 say in 116, what happens when you're
11 using an adhesive or adhesive lamination
12 that is applied in some sort of a
13 solvent, be that an organic solvent or
14 water, there's always the risk of forming
15 bubbles. And if you form bubbles, you
16 have a place where the layers that the
17 adhesion between the layers is interfered
18 with and so, therefore, it can serve as
19 an initiation point for delamination.
20 That sort of phenomenon specifically
21 that's discussed here, you know, is
22 relevant to adhesive lamination.

1 And, you know, co-extrusion is an
2 extremely complex process. There's
3 variations in the process and the type of
4 equipment, all kinds of variables, and I
5 didn't see any need to get into that
6 discussion here. I just -- what was
7 important was that Dr. Osswald kind of
8 blithely rejected co-extrusion as a
9 suitable method for making aligners.

10 BY MR. COLLINS-CHASE:

11 Q In a multilayer sheet made with
12 co-extrusion, how do the different layers bind to one
13 another?

14 MR. ROSATO: Object to form. This
15 is outside the scope of direct.

16 THE WITNESS: Yeah, I mean, again,
17 that's one of the points. I just haven't
18 done a detailed discussion of
19 co-extrusion. I -- you know, I mean, you
20 could write a book about it, and it
21 wasn't necessary to -- for me to provide
22 a critique of Dr. Osswald's assumptions

1 and conclusions.

2 BY MR. COLLINS-CHASE:

3 Q In Paragraph 110 of your declaration,
4 Dr. Kimmel, you cite Dr. Osswald, who says that
5 co-extrusion -- and this is a quote in your Paragraph
6 110 of Dr. Osswald: Co-extrusion, quote, may lead to
7 molecular diffusion or mixing between the layers, as
8 well as cross-linking, that can change the properties
9 of the polymers within a layer.

10 Do you see that?

11 A Yes.

12 MR. ROSATO: Object to form.

13 THE WITNESS: Sorry.

14 BY MR. COLLINS-CHASE:

15 Q Do you agree with Dr. Osswald that
16 co-extrusion may lead to molecular diffusion?

17 MR. ROSATO: Object to form.

18 THE WITNESS: I haven't expressed
19 that opinion. The opinion I expressed
20 here is that Dr. Osswald doesn't cite
21 anything supporting his assertion, and --
22 and then goes on to contradict himself by

1 saying, well, you should use adhesive
2 lamination but, look, his quote in
3 Ebnesajjad, E-B-N-E-S-A-J-J-A-D, when
4 describing -- you know, describes exactly
5 the same problems.

6 So he contradicts himself. He
7 doesn't give us a satisfactory
8 explanation, anything close to a complete
9 explanation of why he's making this
10 conclusion. That was what's important --
11 what was important to me in writing the
12 declaration.

13 BY MR. COLLINS-CHASE:

14 Q You said that he contradicts himself. So
15 you disagree with his statement that you quote in
16 this paragraph?

17 MR. ROSATO: Object to form.

18 Misstates.

19 THE WITNESS: I haven't said that I
20 disagree with him. I -- all I've said is
21 he doesn't provide us any evidence that
22 supports his assertions, plus he provides

1 contradictory evidence which seems to
2 contradict his assertion, and that's all
3 I'm trying to say.

4 BY MR. COLLINS-CHASE:

5 Q And my question to you, sir, is whether
6 you agree with the statement that you've quoted in
7 this paragraph by Dr. Osswald regarding co-extrusion
8 leading to molecular diffusion.

9 MR. ROSATO: Object to form. Asked
10 and answered.

11 THE WITNESS: I haven't -- I
12 haven't taken any position on that point
13 in the declaration.

14 BY MR. COLLINS-CHASE:

15 Q I understand that's your position. I'm
16 asking you right now whether you agree with the
17 statement. You put the statement in your Paragraph
18 110 and I'm asking you if you agree with it.

19 A I can --

20 MR. ROSATO: Object to form. Asked
21 and answered.

22 THE WITNESS: Sorry.

1 MR. ROSATO: You're good.

2 THE WITNESS: I can quote his
3 statement without making any conclusion
4 about whether I agree with it or not
5 agree with it. The point is that he
6 contradicts himself. And it's -- the
7 fact that he contradicts himself has
8 nothing to do with the fact of whether I
9 agree with his statement or whether I do
10 not agree with his statement. I haven't
11 taken any position on that in the
12 declaration.

13 BY MR. COLLINS-CHASE:

14 Q Sir, you quoted his statement. I'm
15 entitled to ask you whether you agree with it. And
16 I'm asking you that and you haven't answered the
17 question. So I'm going to ask you one more time.

18 You quoted Dr. Osswald as saying that
19 co-extrusion may lead to molecular diffusion or
20 mixing between the layers. Do you agree with that
21 statement?

22 MR. ROSATO: Object to form.

1 Mischaracterizes the testimony, and this
2 has been asked and answered. Quit
3 badgering the witness.

4 THE WITNESS: I haven't taken a
5 position on that and I'm not going to
6 take a position on it today because it's
7 not something that I've worked on,
8 thought about and put in writing in the
9 declaration.

10 BY MR. COLLINS-CHASE:

11 Q So sitting here today, you haven't worked
12 on, thought about or put in writing whether a
13 co-extrusion may lead to molecular diffusion or
14 mixing between the layers?

15 MR. ROSATO: Object to form. Asked
16 and answered, outside the scope of
17 direct.

18 THE WITNESS: I think you just
19 quoted what I said. So, yeah, I said
20 that.

21 BY MR. COLLINS-CHASE:

22 Q And you can't, as a matter of scientific

1 principle in a process that you used in your career,
2 tell me whether that process leads to molecular
3 diffusion or mixing between polymer layers?

4 MR. ROSATO: Object to form.

5 Foundation, asked and answered, outside
6 the scope of direct.

7 THE WITNESS: Again, my -- my
8 understanding of this process is not to
9 test what I've learned in over 60 years
10 in this field, but what I've said in my
11 declaration in terms of my testimony.

12 BY MR. COLLINS-CHASE:

13 Q We're entitled, given that you're holding
14 yourself out as an expert, to also ask about your
15 understanding of the scientific principles that
16 you've put at issue in the declaration, and that
17 includes co-extrusion, so I'll ask you again.

18 As a matter of general science,
19 co-extrusion, being a process that you have used in
20 your career, do you know whether co-extrusion may
21 lead to molecular diffusion or mixing between the
22 layers in a multilayer polymer sheet?

1 MR. ROSATO: Object to form. Asked
2 and answered.

3 THE WITNESS: Yeah, I mean, you're
4 asking an extremely general question that
5 would require, you know -- you know,
6 months and years of study with a variety
7 of different systems in order to come up
8 with an answer. There's not one answer
9 to the question, and it's -- was not
10 necessary to even address that issue in
11 order to make the point I was trying to
12 make in Paragraph 110.

13 So I haven't addressed it, and I'm
14 not -- I'm not ready to address it now.

15 I -- it's a very complicated question.

16 BY MR. COLLINS-CHASE:

17 Q You ran a co-extrusion process in your
18 experience that you've mentioned involving a sheet
19 that had, you thought, perhaps three layers, right?

20 MR. ROSATO: Object to form.

21 THE WITNESS: I said that, yes.

22 BY MR. COLLINS-CHASE:

1 Q When you ran the co-extrusion process,
2 did the three layers bind to each other?

3 MR. ROSATO: Objection. Form,
4 outside the scope of direct.

5 THE WITNESS: Yeah, I mean, I don't
6 know what that has to do with this, but
7 the simple answer is sometimes yes,
8 sometimes no.

9 BY MR. COLLINS-CHASE:

10 Q You did not always have the three layers
11 adhering to each other in the co-extrusion process
12 that you used?

13 A I mean --

14 MR. ROSATO: Object to form, scope.

15 THE WITNESS: Sorry. I mean, I --
16 we -- now we're getting into an area of
17 what would be proprietary knowledge of
18 what -- the development work we were
19 doing at that time.

20 It's -- it's -- you know, I
21 still -- even though it was a long time
22 ago, I still have some knowledge that I

1 would regard -- you know, I think falls
2 under my obligation of secrecy of what I
3 learned, you know, as an employee. I
4 just can't answer that question for that
5 reason.

6 It -- what we were doing is a very
7 special case of co-extrusion because of
8 the kinds of materials we were working
9 with, and so any conclusions from that
10 work have very little bearing on -- in
11 terms of a specific question of like did
12 the layers adhere in terms of what we're
13 discussing here. And it has nothing to
14 do with the fact that Dr. Osswald makes
15 the statement and didn't -- he doesn't
16 explain what he means and why he says
17 that. So --

18 BY MR. COLLINS-CHASE:

19 Q To avoid any confidentiality, I can ask
20 it this way.

21 In your experience that you are relying
22 on in forming your opinions in this case, have you

1 ever come across a co-extrusion process used to make
2 a multilayer polymer sheet in which the layers
3 adhered to each other?

4 MR. ROSATO: Object to form --
5 excuse me. Object to form, outside the
6 scope of direct.

7 THE WITNESS: In most practical and
8 commercial applications of co-extrusion,
9 we want the layers to adhere to each
10 other.

11 BY MR. COLLINS-CHASE:

12 Q How do the different layers in a
13 multilayer sheet adhere to each other in a
14 co-extrusion process?

15 MR. ROSATO: Object to form,
16 outside the scope.

17 THE WITNESS: Yeah. I mean, again,
18 that's -- that's a complicated question.
19 There's all kinds of different answers
20 and it's well beyond the scope of
21 anything that I talked about in the
22 declaration. It's just -- I -- you know,

1 it's -- yeah. I leave it at that.

2 BY MR. COLLINS-CHASE:

3 Q To clarify, you are unwilling to answer
4 the question of how the layers in a co-extruded
5 multilayer sheet might adhere to each other?

6 MR. ROSATO: Object to form,
7 outside the scope of direct, and asked
8 and answered.

9 THE WITNESS: I think "unwilling"
10 is the wrong term to characterize what
11 I'm saying.

12 I'm saying I have, you know -- that
13 you've asked a very complicated question,
14 it's beyond the scope of what I've
15 written here, and my understanding is
16 that -- that you're supposed to be asking
17 me questions about what I've written, and
18 that doesn't -- what you're asking about
19 is not what I've written. It's nowhere
20 in here. Because my concern was what
21 Dr. Osswald said and didn't say and
22 that's what this is about.

1 BY MR. COLLINS-CHASE:

2 Q Your declaration talks about what you
3 believe are disadvantages of adhesive lamination, and
4 you contrast those with the co-extrusion process,
5 including in Paragraph 110.

6 MR. ROSATO: Object to form.

7 BY MR. COLLINS-CHASE:

8 Q But despite the fact that you address
9 those issues, you're not willing to answer questions
10 about co-extrusion processes that you contrast with
11 adhesive lamination; is that right?

12 MR. ROSATO: Object to form,
13 misstates testimony.

14 THE WITNESS: Yeah, I don't believe
15 that the -- that my discussion of
16 adhesive lamination has anything to do
17 with what would happen in co-extrusion.

18 This is a specific discussion of
19 the process that Dr. Osswald is
20 recommending and relied upon that is
21 independent of anything else. It's --
22 it's a discussion of co-extrusion. I

1 don't think there's any -- any comparison
2 of co-extrusion to adhesive lamination.
3 This is evaluating adhesive lamination
4 standing on its own as a process.

5 BY MR. COLLINS-CHASE:

6 Q In Paragraph 112, Dr. Kimmel, you say:
7 Instead of extruding film simultaneously in a process
8 like co-extrusion, adhesive lamination requires
9 forming, cooling and winding up sheets separately,
10 moving the wound-up rolls to a suitable lamination
11 machine where adhesive can be added to form a new
12 layer in between the two layers, cured and combined
13 with another layer.

14 Do you see that?

15 A Yes.

16 Q So you, in that sentence, have compared
17 co-extrusion to adhesive lamination, right?

18 MR. ROSATO: Object to form.

19 THE WITNESS: Only in terms of the
20 general nature of the process, not in
21 terms of its details.

22 BY MR. COLLINS-CHASE:

1 Q And so the general nature of the
2 co-extrusion process is that it does not require the
3 things that you list here for adhesive lamination; is
4 that right?

5 MR. ROSATO: Object to form.

6 THE WITNESS: Yeah, I mean, that's
7 what I've stated, yeah.

8 BY MR. COLLINS-CHASE:

9 Q But you're unwilling to tell us what it
10 does involve instead in terms of forming the
11 multilayer sheet in terms of the co-extrusion
12 process?

13 MR. ROSATO: Object to form.

14 THE WITNESS: I don't understand
15 your question.

16 BY MR. COLLINS-CHASE:

17 Q You say in this sentence in Paragraph 112
18 things that you think make adhesive lamination
19 undesirable, but you're not willing to specify what
20 actually happens in a co-extrusion process that makes
21 it different; is that correct?

22 MR. ROSATO: Object to form.

1 THE WITNESS: I don't cover that
2 subject because it's not necessary to
3 make the points I'm trying to make, and
4 it's beyond the -- it's beyond the scope
5 of my discussion.

6 BY MR. COLLINS-CHASE:

7 Q You don't cite any support for that
8 sentence in your declaration in Paragraph 112, do
9 you?

10 MR. ROSATO: Object to form.

11 THE WITNESS: You mean I don't cite
12 any -- I don't cite anything that backs
13 up what I -- how I describe adhesive
14 lamination? Is that your question?

15 BY MR. COLLINS-CHASE:

16 Q Right. There's no citation to support
17 that sentence, correct?

18 A No, this discussion is based on my
19 personal experience.

20 Q In your personal experience, how is
21 co-extrusion preferable to adhesive lamination in
22 terms of how the layers are adhered?

1 MR. ROSATO: Object to form,
2 outside the scope of direct.

3 THE WITNESS: I haven't -- first of
4 all, I haven't made that assumption. And
5 second of all, it's not a question that
6 I've considered because I didn't think it
7 was relevant to the points I was trying
8 to make about Dr. Osswald's assertions.

9 BY MR. COLLINS-CHASE:

10 Q Do co-extrusion processes use heat?

11 MR. ROSATO: Object to form,
12 outside the scope of direct.

13 THE WITNESS: If we're going to get
14 into a detailed discussion of what kind
15 of little bits there are in the
16 co-extrusion process, you know, that's --
17 I just don't discuss that. I don't talk
18 about what co-extrusion is and isn't
19 because it's not part of my -- the points
20 I'm trying to make.

21 BY MR. COLLINS-CHASE:

22 Q I'm asking the question to explore your

1 experience as a purported expert in this area
2 regarding the co-extrusion process that you address
3 in your declaration. So I'll ask my question again.

4 Does co-extrusion use heat?

5 MR. ROSATO: Object to form,
6 outside the scope of direct.

7 THE WITNESS: But I haven't
8 addressed co-extrusion in my declaration.
9 I've only quoted what Dr. Osswald said.
10 I haven't discussed what co-extrusion is
11 or isn't.

12 BY MR. COLLINS-CHASE:

13 Q Do you know what it is or isn't?

14 A Except to say that --

15 MR. ROSATO: You've got to let him
16 finish his answer.

17 THE WITNESS: Except to say what's
18 in 112, that co-extrusion, in its -- in
19 the most general terms, is extruding film
20 simultaneously. I think that's all I've
21 said about co-extrusion because it's
22 totally outside the points I'm trying to

1 make about why adhesive lamination is a
2 poor choice for the Aligner application.

3 BY MR. COLLINS-CHASE:

4 Q Dr. Kimmel, do you know whether the
5 SmartTrack ST30 product is made using co-extrusion?

6 A The only way I would know that is if it's
7 in -- is if it's in Ms. Chen's declaration. And off
8 the top of my head I don't remember whether it's in
9 the declaration or not, but I have no other way of
10 knowing whether ST30 is made using co-extrusion.

11 Q Okay. Dr. Kimmel, if you turn to Page --
12 or Paragraph 127 of your declaration, and again, that
13 is on Page 67.

14 A Yes.

15 Q In Paragraph 127 you state: As
16 illustrated in the charts below, ST30 Aligners embody
17 the independent claims of the multilayer appliance
18 patents.

19 Do you see that?

20 A I see that, yes.

21 Q And then these are the charts below that
22 paragraph that you said compare the ST30 Aligners to

1 the -- some of the claims of the patents, right?

2 A Yes.

3 Q Your basis for these statements was, as
4 you've said, Ms. Chen's declaration, right?

5 A That's correct.

6 Q If you look at Claim 1 of the '613 patent
7 that you reproduce in the chart in Paragraph 128, do
8 you see in the third row down, which is on Page 68 of
9 your declaration, that Claim 1 requires a hard layer?

10 Do you see that?

11 A Yes.

12 Q And then in the next box down, Claim 1
13 requires a soft polymer layer.

14 Do you see that?

15 A Yes.

16 Q And then it's a three-layer aligner,
17 right?

18 MR. ROSATO: Object to form.

19 BY MR. COLLINS-CHASE:

20 Q And I'll direct your attention back to
21 Page 67, if that's helpful.

22 A No, I mean, Ms. Chen -- Ms. Chen states

1 that ST30 is the three layers.

2 Q Right. And in the second row on Page 67,
3 it says: A sheet comprising three or more polymer
4 layers.

5 Right? It's on the prior page. It
6 says --

7 A Oh, three or more polymer layers. Okay.

8 Q You see it says: Providing a sheet
9 comprising three or more polymer layers.

10 Right?

11 A Yes.

12 Q Okay. So Claim 1 of the '613 patent
13 requires a third layer, right?

14 A Yes.

15 Q Does Claim 1 of the '613 patent require
16 the third layer to be a hard polymer?

17 MR. ROSATO: Object to form.

18 THE WITNESS: Claim 1 is silent as
19 to what the third layer is.

20 BY MR. COLLINS-CHASE:

21 Q Does Claim 1 of the '613 patent require
22 the third layer to be located in any specific place

1 relative to the other two layers?

2 A Let me -- Claim 1 is reproduced here, and
3 the only place a third layer was mentioned is in the
4 second phrase, where it says: Providing a sheet
5 comprising three or more polymer layers.

6 That's all it says about the third --
7 that's all Claim 1 says about the third layer.

8 Q It, therefore, doesn't require it to be
9 in any particular configuration or orientation
10 relative to the other two layers, right?

11 A Claim 1 --

12 MR. ROSATO: Object to form.

13 THE WITNESS: -- is not specific
14 about the third layer, right.

15 BY MR. COLLINS-CHASE:

16 Q Is it your understanding, Dr. Kimmel,
17 that Claim 1 of the '613 patent encompasses a soft,
18 hard, soft layer configuration?

19 A Could you ask your question again,
20 please.

21 Q Sure. Is it your understanding that
22 Claim 1 of the '613 patent encompasses a soft, hard,

1 soft layer configuration?

2 MR. ROSATO: Object to form.

3 THE WITNESS: Claim 1 is -- Claim
4 1, in and of itself, is silent on that
5 point.

6 BY MR. COLLINS-CHASE:

7 Q Claim 1 of the '613 patent is silent
8 regarding layer configuration?

9 A I've said that already.

10 Q Claim 1 of the '613 patent allows for
11 more than three layers to be present in the
12 multilayer sheet, right?

13 A It does.

14 Q Is there any limit in Claim 1 of the '613
15 patent regarding how many layers can be present in
16 the multilayer sheet?

17 A It says three or more layers. That
18 sounds pretty wide open.

19 Q Dr. Kimmel, if you would turn to Page 71
20 of your declaration, please.

21 A Okay.

22 Q Do you see that below Paragraph 136,

1 there is a similar table for the '384 patent?

2 A I see that.

3 Q If you flip to the next page, Page 72, do
4 you see in the middle row that Claim 1 of the '384
5 patent requires a hard layer?

6 A Yes.

7 Q And Claim 1 of the '384 patent also
8 requires a soft layer, correct?

9 A Yes.

10 Q And Claim 1 of the '384 patent requires
11 three or more polymer layers, right?

12 A Yes.

13 Q Just as we discussed for the '613 patent,
14 does Claim 1 of the '384 patent impose any
15 limitations on the characteristics of the third
16 layer?

17 MR. ROSATO: Object to form.

18 THE WITNESS: Not in the claim
19 we're looking at, no.

20 BY MR. COLLINS-CHASE:

21 Q And Claim 1 of the '384 patent also does
22 not impose any restrictions on the arrangement or

1 configuration of the three layers, does it?

2 A It does not.

3 Q Claim 1 of the '384 patent also doesn't
4 impose any limitations on the number of layers that
5 may be present in the sheet, does it?

6 A It says three or more layers.

7 Q So as with the '613 patent Claim 1, it
8 could have any number greater than three, three or
9 more?

10 A Yes, that would be the interpretation.

11 Q Dr. Kimmel, is it your understanding that
12 Claim 1 of the '384 patent encompasses a soft, hard,
13 soft layer configuration?

14 A Claim 1 of the '384 patent doesn't tell
15 us anything about the order of the layers. It says
16 three or more layers, at least -- you know, it
17 comprises a hard polymer layer, a soft polymer layer
18 and undisclosed other layers with the order
19 unspecified.

20 Q Dr. Kimmel, would you please turn to Page
21 76.

22 A I'm there.

1 Q Do you see that there's a similar table
2 for the '090 patent claims?

3 A I do.

4 Q Do you see on this page that it -- the
5 Claim 1 of the '090 patent recites: A multilayer
6 sheet comprising three polymer layers.

7 A Yes.

8 Q And then if you turn the page, does Claim
9 1 of the '090 patent require that the first layer
10 consists of a copolyester?

11 A That's what it says.

12 Q And the second layer in Claim 1 of the
13 '090 patent consists of a thermoplastic polyurethane
14 elastomer, right?

15 A Yes.

16 Q Claim 1 of the '090 patent doesn't impose
17 any restrictions on what is used to make the third
18 layer, does it?

19 MR. ROSATO: Object to form.

20 THE WITNESS: That's correct.

21 BY MR. COLLINS-CHASE:

22 Q Claim 1 of the '090 patent doesn't impose

1 any restriction on the number of layers in the sheet,
2 does it?

3 A No, because it says comprising three
4 layers. So it means it has to have at least three
5 layers.

6 Q And like the claims we discussed from the
7 '613 and '384 patents, Claim 1 of the '090 patent
8 also doesn't impose any restriction on the
9 arrangement of the layers, does it?

10 MR. ROSATO: Object to form.

11 THE WITNESS: That would be my
12 interpretation.

13 BY MR. COLLINS-CHASE:

14 Q Dr. Kimmel, if you could turn the page to
15 Page 79. Do you see that this is a table where the
16 heading says '090 Patent Claims?

17 A Yes.

18 Q If you look at the prior page, Page 78,
19 the heading here is the '091 Patent?

20 A Yep.

21 Q Is it -- my understanding is that this
22 may be a typo in the heading of the table and that

1 you're intending to refer here --

2 A That's what I was just thinking about.

3 Q -- to the '091 patent.

4 Can you confirm that for me, please?

5 A Well, yeah, I mean, the heading 4 before
6 Paragraph 138 says the '091 patent. So that chart is
7 mislabeled, yeah.

8 Q So in Claim 1 of the '091 patent, it
9 requires a first layer containing a single polymer
10 wherein the single polymer of the first layer is a
11 copolyester.

12 Do you see that?

13 A Yes.

14 Q And Claim 1 of the '091 patent requires a
15 second layer containing a single polymer wherein the
16 single polymer of the second layer is a thermoplastic
17 polyurethane elastomer.

18 Do you see that?

19 A Yes.

20 Q Does Claim 1 of the '091 patent also
21 require a third layer?

22 A Yes.

1 Q Claim 1 of the '091 patent does not
2 impose any restriction on the polymer for the third
3 layer, does it?

4 A No.

5 Q Claim 1 of the '091 patent does not
6 impose any restriction on the number of layers in the
7 sheet, does it?

8 MR. ROSATO: Object to form.

9 THE WITNESS: No.

10 BY MR. COLLINS-CHASE:

11 Q Claim 1 of the '091 patent does not
12 impose any restriction on the arrangement or
13 configuration of the layers, does it?

14 A No.

15 MR. COLLINS-CHASE: I think we've
16 been going about an hour. We could take
17 a break, if you'd like, Dr. Kimmel. I'm
18 happy to soldier on to the next thing,
19 but it's a new section of the outline.
20 So I'm happy to take a break if you'd
21 prefer. Just let me know what you'd like
22 to do.

1 MR. ROSATO: Let's take a break.

2 THE WITNESS: Do you want to take a
3 break now? Are we going to do a lunch
4 break?

5 MR. COLLINS-CHASE: Would you like
6 a lunch break now?

7 THE WITNESS: No, I'm saying it's
8 11:30.

9 MR. COLLINS-CHASE: We will at some
10 point eat food, yeah, I assume so. I
11 don't know if that's now for you or not.

12 THE WITNESS: No, it's a little
13 early.

14 MR. ROSATO: Why don't we take a
15 five-minute break.

16 (Brief pause.)

17 BY MR. COLLINS-CHASE:

18 Q Dr. Kimmel, before the break, we were
19 discussing the claims of the patents that you've
20 reproduced in your declaration.

21 Do you recall that?

22 A Yes.

1 Q For all four of the patents, we talked
2 about there not being any restrictions on the polymer
3 used to make the third layer, right?

4 A That's correct.

5 Q How many types of polymers could be used
6 to make that third layer?

7 MR. ROSATO: Object to form,
8 outside the scope of direct.

9 THE WITNESS: In principle -- I
10 mean, that's not something I commented
11 on. But I will say, in principle, it
12 could be any polymer that exists. In
13 practice, we have to take into account
14 the application. So it's got to be a
15 polymer that's suitable for the
16 application. Okay?

17 And -- but beyond that, you know, I
18 don't know how many such polymers there
19 are, and I haven't even -- I haven't
20 considered that question, you know. But
21 the -- but as he said, the third layer,
22 at least in the independent claim, is --

1 is unspecified.

2 BY MR. COLLINS-CHASE:

3 Q It would have to be a suitable polymer
4 for the third layer, right?

5 A Well, why would you use it if it weren't
6 suitable?

7 Q We talked about how the claims we were
8 discussing had a hard layer or a copolyester layer.

9 Do you remember that?

10 A Yes.

11 Q For the claims that specify copolyester
12 layer, there are many types copolyester, right?

13 MR. ROSATO: Object to form.

14 THE WITNESS: Yes. Yes, there are.

15 BY MR. COLLINS-CHASE:

16 Q Hundreds of copolyesters, would you say?

17 A There are certainly lots of -- I don't
18 know if it's hundreds, but there are lots.

19 Q Some of the claims mentioned a
20 thermoplastic polyurethane elastomer layer, right?

21 A Yes.

22 Q Have you heard thermoplastic polyurethane

1 elastomers referred to as TPUs?

2 A Yes.

3 Q There are many types of TPUs, right?

4 A Yes, there are.

5 Q Hundreds?

6 A I don't know.

7 Q If you put those things together in terms
8 of the number of copolyesters, the number of TPUs and
9 the number of polymers that could be used for the
10 third layer, there are quite a few permutations of
11 polymers that could be used for this multilayer sheet
12 in the claims, right?

13 MR. ROSATO: Object to form,
14 outside the scope of direct.

15 THE WITNESS: Yeah, in this
16 context, I haven't addressed that
17 question, but, I mean, if there are many
18 polyesters and many TPUs and unspecified
19 third layers, obviously there are
20 multiple combinations.

21 BY MR. COLLINS-CHASE:

22 Q That's just common, right?

1 A Yeah, right.

2 Q I guess we can add one thing.

3 The claims that we talked about also
4 aren't limited to three layers, right?

5 A That's correct.

6 Q So you could add, on top of those
7 permutations, other polymer layers made of other
8 polymers, right?

9 MR. ROSATO: Object to form,
10 outside the scope of direct.

11 THE WITNESS: I mean, the literal
12 interpretation of the claims would say
13 the answer to that question is yes.

14 BY MR. COLLINS-CHASE:

15 Q And SmartTrack ST30 is a three-layer
16 material with two soft layers surrounding a hard
17 layer, right?

18 A Yes.

19 Q So that's one permutation that would fall
20 within the claims in your opinion?

21 A Yes.

22 Q Dr. Kimmel, would you please turn to

1 Paragraph 128 of your declaration, which is on Page
2 67.

3 And this is the chart for the '613 patent
4 that we talked about earlier, right?

5 A Yes.

6 Q If you turn -- actually, I might need to
7 give them to you. I'm going to hand you a copy of
8 the '613 patent.

9 A Okay.

10 (Kimmel Deposition Exhibit No. 1001
11 was identified for the record.)

12 BY MR. COLLINS-CHASE:

13 Q This has been marked as Exhibit 1001.

14 Dr. Kimmel, I believe you're familiar
15 with this document, right?

16 A Yes.

17 Q Would you please turn to the second to
18 last page, which is labeled Page 20 of 21.

19 A Okay.

20 Q Do you see Claim 3 in Column 9?

21 A Yes.

22 Q Do you see Claim 3 begins: The method of

1 Claim 1 wherein the hard polymer layer comprises at
2 least two layers.

3 Do you see that?

4 A Yes.

5 Q Does the hard polymer layer in ST30
6 comprise two layers?

7 A Not to the best of my knowledge.

8 Q If you look at Claim 11 in Column 10 on
9 the same page?

10 A Column?

11 Q Sorry.

12 A I'm sorry. What was that again?

13 Q Claim 11.

14 A Claim 11.

15 Q And it's in Column 10 on the same page.

16 A Okay.

17 Q Claim 11 states: The method of Claim 1
18 wherein the hard polymer layer comprises a plurality
19 of co-extruded or laminated polymer layers.

20 Do you see that?

21 A Yes.

22 Q Do you agree that the hard layer in ST30

1 does not have a plurality of co-extruded or laminated
2 polymer layers, as recited in the claim?

3 MR. ROSATO: Object to form,
4 outside the scope of direct.

5 THE WITNESS: Yeah, there's nothing
6 in Chen's declaration that would account
7 for that.

8 BY MR. COLLINS-CHASE:

9 Q Nothing in Chen's declaration that would
10 tell you that it has that characteristic?

11 A That's correct.

12 Q If you look at Claim 19 in that same
13 column, do you see that it states: The hard polymer
14 layer comprises at least two layers?

15 A Yes.

16 Q Similar question to the one I asked you
17 earlier.

18 You agree that ST30 does not have a hard
19 polymer layer that comprises at least two layers as
20 recited in Claim 19, right?

21 MR. ROSATO: Object to form,
22 outside the scope of direct.

1 THE WITNESS: Yeah, based -- based
2 on my reading of Chen's declaration, I
3 don't believe it does.

4 BY MR. COLLINS-CHASE:

5 Q Dr. Kimmel, would you please turn to
6 Paragraph 137 of your declaration.

7 A 137.

8 Q It's Page 76.

9 A I'm there.

10 Q And this is the chart for the '090
11 patent, right?

12 A Correct.

13 Q I'm going to hand you the '090 patent,
14 which has been marked as Exhibit 1001 in the '820
15 IPR.

16 Dr. Kimmel, I assume you're familiar with
17 this document, the '090 patent?

18 A Yes.

19 Q Would you please turn to the last page,
20 which is Page 16 of 16 in Exhibit 1001.

21 A Page 16?

22 Q Correct.

1 A Oh, you could have just said the back.

2 Q Dr. Kimmel, in Paragraph 137 of your
3 declaration, you say: At least independent Claim 1
4 of the '090 patent is embodied by the making -- by
5 the method of making ST30 Aligners.

6 Do you see that?

7 A Yes.

8 Q Would you please look at Claim 3 of the
9 '090 patent, which is on the back page.

10 A Okay.

11 Q Do you see that Claim 3 states: The
12 method of Claim 1 wherein the third layer comprises a
13 same or different copolyester.

14 A I see that.

15 Q You agree, right, that ST30 does not have
16 a second layer of a copolyester as recited in Claim
17 3?

18 MR. ROSATO: Object to form,
19 outside the scope of direct.

20 THE WITNESS: Yeah, that's not what
21 Chen's declaration teaches.

22 BY MR. COLLINS-CHASE:

1 Q If you look at Claim 6 of the '090
2 patent, it states: The method of Claim 1 wherein the
3 multilayer sheet further comprises a fourth layer
4 comprising a same or different thermoplastic
5 polyurethane elastomer.

6 Do you see that?

7 A Yes.

8 Q You agree that ST30 is a three-layer
9 appliance and doesn't have the fourth layer recited
10 in Claim 6, right?

11 A That's what Chen's declaration tells us.

12 Q If you look at Claim 7, it says: The
13 method of Claim 6 wherein the first layer and the
14 third layer are disposed between the second and the
15 fourth layer.

16 Do you see that?

17 A Yes.

18 Q You would agree that ST30 does not have a
19 fourth layer disposed anywhere as recited in Claim 7,
20 right?

21 A Yes.

22 Q If you would please turn to Paragraph 138

1 of your declaration, which is on Page 78.

2 A Yes.

3 Q This is addressing the '091 patent,
4 right?

5 A Correct.

6 Q You state: In my opinion and as shown in
7 the chart below, at least the '091 patent's
8 independent claims are embodied by ST30 Aligners.

9 Do you see that?

10 A Yes.

11 Q I'm going to hand you the '091 patent,
12 which has been marked as Exhibit 1001 in the '821
13 proceeding.

14 Dr. Kimmel, you're familiar with the '091
15 patent, Exhibit 1001, right?

16 A Yes.

17 Q Would you please turn to Page 15 of 16
18 and look at Claim 2.

19 A Yes.

20 Q Claim 2 states: The multilayer sheet of
21 Claim 1 wherein the third layer contains a single
22 polymer, and wherein the single polymer of the third

1 layer is a same or different copolyester as the
2 single polymer of the first layer, and wherein the
3 first layer is disposed between the second layer and
4 the third layer.

5 Do you see that?

6 A Yeah, I see it.

7 Q You would agree that ST30 does not have
8 two layers of a copolyester as recited in Claim 2,
9 right?

10 MR. ROSATO: Object to form,
11 outside the scope of direct.

12 THE WITNESS: According to Chen's
13 declaration, that's correct.

14 BY MR. COLLINS-CHASE:

15 Q If you look at Claim 3, please, it
16 states: The multilayer sheet of Claim 1 comprising a
17 fourth layer containing a single polymer.

18 Do you see that?

19 A Yes.

20 Q It specifies that the single polymer of
21 the fourth layer is a same or different thermoplastic
22 polyurethane elastomer as the singular polymer of the

1 second layer.

2 Do you see that?

3 A Yeah.

4 Q You agree that ST30 does not have a
5 fourth layer of any kind as recited in Claim 3,
6 right?

7 A That's correct according to Chen's
8 declaration.

9 MR. ROSATO: Object to form and
10 outside the scope.

11 BY MR. COLLINS-CHASE:

12 Q If you look at Claim 8, please,
13 Dr. Kimmel. Do you see that Claim 8 says: The
14 multilayer dental aligner of Claim 6 wherein the
15 multilayer sheet further comprises a third layer
16 containing a single polymer wherein the single
17 polymer of the third layer is a same or different
18 copolyester as the single polymer of the first layer.

19 A Okay.

20 MR. ROSATO: Object to form.

21 BY MR. COLLINS-CHASE:

22 Q You agree that ST30 does not have a

1 second layer of a copolyester as recited in Claim 8,
2 right?

3 MR. ROSATO: Object to form and
4 outside the scope of direct.

5 THE WITNESS: According to Chen's
6 declaration, that's correct.

7 BY MR. COLLINS-CHASE:

8 Q Would you look at Claim 14 of the '091
9 patent, please.

10 A I'm -- yes. I'm sorry.

11 Q Do you see that Claim 14 requires the
12 multilayer sheet to have a fourth layer?

13 A Yes.

14 Q You would agree that ST30 does not have a
15 fourth layer as recited in Claim 14 of the '091
16 patent, right?

17 A Again, that's not what Chen's declaration
18 teaches.

19 Q If you look at Claim 15, it states that:
20 The fourth layer consists of a same or different
21 thermoplastic polyurethane elastomer.

22 Do you see that?

1 A Yes.

2 Q ST30 does not have a fourth layer as
3 recited in Claim 15, right?

4 A That's correct.

5 Q And if you look at Claim 21, which is on
6 the back page of this document, Page 16 of 16, do you
7 see that Claim 21 recites that: The third layer
8 consists of a same or different copolyester and
9 wherein the third layer is co-extruded with or
10 laminated to the first layer.

11 Do you see that?

12 A I see it, yes.

13 Q You agree that ST30 does not have two
14 layers of a copolyester as recited in Claim 21 of the
15 '091 patent, right?

16 MR. ROSATO: Object to form and
17 outside the scope.

18 THE WITNESS: Again, that's what
19 Chen's declaration proposes.

20 BY MR. COLLINS-CHASE:

21 Q Dr. Kimmel, do you still have the '613
22 patent in front of you in your stack of documents?

1 A Yes, I have it.

2 Q Would you please turn to Column 5, which
3 is on Page 18 of 21.

4 A Okay.

5 Q I'll direct your attention to the text
6 beginning on Line 18. And I can read it to you --

7 A Okay.

8 Q -- to make sure we're on the same page.

9 It says: Figure two shows a multilayer
10 structure according to the present invention.

11 A That's not Line 18 of Column 6.

12 Q Column 5.

13 A Okay. Now I see it. Okay. Okay.
14 Column 5, right.

15 Q So Line 18 begins: Figure 2 shows a
16 multilayer structure according to the present
17 invention. As shown, a Multilayer Sheet 20 can
18 include a three-layer structure, colon, a Hard
19 Polymer Layer 24 and Two Soft Polymer Layers 22, 26.
20 The hard polymer layer can be disposed between a
21 first soft polymer layer and a second soft polymer
22 layer.

1 This describes a soft, hard, soft layer
2 configuration, right?

3 A That's what --

4 MR. ROSATO: Object to form.

5 THE WITNESS: Sorry. That's what
6 it describes.

7 BY MR. COLLINS-CHASE:

8 Q This section of text references Figure 2
9 of the patent, right?

10 A Yes.

11 Q And it states that the Multilayer Sheet
12 20 can include a three-layer structure, right?

13 A I'm sorry. Would you repeat that
14 question?

15 Q Sure. This section of Column 5
16 referencing Figure 2 states that: The Multilayer
17 Sheet 20 can include a three-layer structure.

18 Do you see that?

19 A Yes.

20 Q And then it gives numbers to label the
21 layers. It labels the hard polymer layer 24, right?

22 A Uh-huh.

1 Q And it labels the soft polymer layers
2 with the numbers 22 and 26?

3 A Yes.

4 Q Do you see that?

5 A Yes.

6 Q Okay. If you go down a little ways in
7 Column 5 to Line 51, it says: In some embodiments,
8 the hard layer can be composed of multiple hard
9 layers, e.g., two or three Hard Polymer Layers 24-1,
10 24-2, 24-N, co-extruded to form one hard layer.

11 Do you see that?

12 A Yes.

13 Q Those numeric indications 24-1, 24-2 and
14 24-N refer to sublayers of the Hard Layer 24, right?

15 MR. ROSATO: Object to form.

16 THE WITNESS: Yeah, that's what it
17 says.

18 BY MR. COLLINS-CHASE:

19 Q Would you agree that the N in 24-N
20 indicates that you can have up to N number of
21 sublayers?

22 A Yes.

1 Q And would you agree with me that that
2 denotation indicates that the number is not bounded?

3 A There's no bound specified in this part
4 of the specification.

5 Q The specification doesn't instruct a
6 person of ordinary skill regarding how to make or use
7 sublayers, does it?

8 MR. ROSATO: Object to form,
9 outside the scope of direct.

10 THE WITNESS: Certainly not in
11 Column 5. The only instruction is what
12 the suitable -- a list of suitable
13 materials for hard polymer layer, which
14 starts on Line 39 of Column 5.

15 BY MR. COLLINS-CHASE:

16 Q You're referring to Column 5, Line 39?

17 A Yes, sir.

18 Q That portion of the specification gives
19 suitable polymeric materials, and states that the
20 hard layer can be comprised of those materials or a
21 combination thereof, right?

22 A Yes.

1 Q If you look at Column 6, Dr. Kimmel, Line
2 41, do you see it says: For example, the hard
3 polymer layer can include several polymer layers
4 laminated together to form the hard polymer layer.

5 A Yes.

6 Q The specification states that the hard
7 polymer layers can be laminated, right?

8 A Yes.

9 MR. ROSATO: Object to form.

10 BY MR. COLLINS-CHASE:

11 Q If you look down in Column 6 to Line 52,
12 it states: Similarly, in some embodiments, the
13 multilayer appliances can include a soft polymer
14 layer of at least two layers of polymeric material.

15 Do you see that?

16 A Yes.

17 Q And then it says: For example, the Soft
18 Polymer Layers 22, 26 can include a layer of several
19 polymer layers 22-1, 22-2, 22-N and 26-1, 26-2, 26-N,
20 respectively, laminated together.

21 Do you see that?

22 A Yes.

1 Q The labels there, would you agree that
2 those have the same meaning as the labels we were
3 talking about for the hard layer in terms of
4 referring to sublayers of the soft layers?

5 MR. ROSATO: Object to form.

6 THE WITNESS: Yes. Yes.

7 BY MR. COLLINS-CHASE:

8 Q And would you agree that the denotation
9 of N, again, refers to an unbounded number of
10 potential sublayers for the soft layer?

11 MR. ROSATO: Object to form.

12 THE WITNESS: Yes.

13 BY MR. COLLINS-CHASE:

14 Q And the soft layers that are referred to
15 in Column 6 can be laminated together, right?

16 A Yes, we're -- they're using "laminated"
17 in a general term. So laminated means forming
18 multiple layers of materials by some process.

19 Q If you turn to Figure 2, which is on Page
20 9 of 21, do you see the three-layer multilayer sheet
21 that was being discussed in Columns 5 and 6?

22 A Yes, I do.

1 Q And do you see that the three layers are
2 set out with a sort of thicker bold line around them?

3 A Yes.

4 Q So the top bold line rectangle is labeled
5 22.

6 Do you see that?

7 A Yes. Yes, I see that. Sorry.

8 Q The bottom bold rectangle is labeled 26?

9 A Yes.

10 Q And the middle layer is labeled 24,
11 right?

12 A Yes.

13 Q And then the sublayers are labeled, as
14 well, with the dash numbers 1, 2, and --

15 A Yes.

16 MR. ROSATO: Object to form.

17 BY MR. COLLINS-CHASE:

18 Q Dr. Kimmel, are you aware of any language
19 in the patents that you analyzed indicating that
20 using sublayers was a novel feature of the invention?

21 MR. ROSATO: Object to form and
22 outside the scope of direct.

1 THE WITNESS: Yeah, I -- in order
2 to answer your question, I'd have to go
3 look through all the claims of the
4 patents. I did not consider that point.

5 BY MR. COLLINS-CHASE:

6 Q Dr. Kimmel, will you turn to Paragraph 25
7 of your declaration, please. That is on Page 12.

8 A Yes.

9 Q You state in Paragraph 25: Each patent
10 describes, quote, multilayer orthodontic positioning
11 appliances, closed quote, that, quote, apply forces
12 to a tooth to generate movement of the tooth, closed
13 quote, to improve the positioning of a patient's
14 teeth.

15 Do you see that?

16 A Yes.

17 Q You speak, a couple lines later in
18 Paragraph 25, about improved aligner performance. Do
19 you see that? I can read you the sentence if that's
20 easier.

21 A I'm reading it.

22 Q The multilayer --

1 A I see what it says, yes.

2 Q So you refer in that sentence to:
3 Improved aligner performance, including improved
4 material performance and stress relaxation
5 properties.

6 Do you see that?

7 A Yes.

8 Q What stress relaxation properties are you
9 referring to there?

10 A The stress relaxation properties that
11 are -- yeah, I don't know off the top of my head if
12 Chen's declaration describes the stress relaxation
13 tests in detail.

14 But, in general, stress relaxation is
15 when you stress a material to a different strain and
16 then look at how the stress decays over time, which
17 is a viscoelastic property of polymers.

18 And it's important in the aligner
19 performance because you want the aligner to continue
20 exerting force on the tooth over as long a period of
21 time as possible, or at least over the period of time
22 that the orthodontist has designated it should be

1 worn. And so that's -- I mean, stress relaxation is
2 being used, you know, as -- as a person of skill
3 would understand stress relaxation.

4 Q Is improved performance on stress
5 relaxation referring to greater stress relaxation or
6 less stress relaxation?

7 MR. ROSATO: Object to form.

8 THE WITNESS: Well, as I just said,
9 you'd want -- you want the aligner to
10 continue exerting force on the tooth for
11 as long as possible, and so you want as
12 little stress relaxation as possible.

13 BY MR. COLLINS-CHASE:

14 Q The next part of this sentence regarding
15 improved material performance, you mentioned longer
16 working range.

17 Do you see that?

18 A Yes.

19 Q What is the working range that you're
20 referring to here?

21 A Yeah, this is -- this is a measure of the
22 distance over which the aligner can perform its tasks

1 or the individual component of the aligner can
2 perform its task.

3 Q When you say "the distance over which the
4 aligner can perform its tasks," what do you mean?

5 A I mean just what I said. You know,
6 the -- you're trying to set up moving these teeth
7 really very small amounts at a time, but the further
8 you can go in the desired direction, the fewer
9 aligners you're going to need. The aligner --
10 changes you're going to need for the thing to keep
11 working.

12 Q Dr. Kimmel, would you turn to Page 87 of
13 your declaration, please.

14 A Yes.

15 Q Do you see in Paragraph 145, you state:
16 As the Chen declaration describes, Align conducted a
17 clinical study comparing the performance of aligners
18 made of ST30 to those made of EX30.

19 Do you see that?

20 A Yes.

21 Q Do you know what the composition is of
22 EX30?

1 A I think it was a -- a type of
2 polyurethane thermoplastic.

3 Q Did you review the results of this study
4 that you refer to in this paragraph?

5 A I reviewed what -- Chen's description in
6 the declaration.

7 Q If you'd turn the page and look at
8 Paragraph 147, please.

9 Do you see that this paragraph says, in
10 the second sentence, that: Patients treated with
11 ST30 Aligners showed significantly superior outcomes
12 to those treated with EX30 Aligners.

13 A Yes.

14 Q And the sentence continues to state:
15 Including a strongly significant increase in on-track
16 performance.

17 Do you see that?

18 A Yes.

19 Q You don't have any experience determining
20 on-track performance for teeth, right?

21 A No. My knowledge is confined to what
22 I've read about the description. And I think in 146

1 I reproduce how On-track, Off-track and Cannot Match
2 are defined, and I understand it in concept,
3 certainly.

4 Q You mentioned On-track, Off-track and
5 Cannot Match, right?

6 A Yes.

7 Q You don't have any experience determining
8 off-track tooth movement for a dental appliance,
9 right?

10 A I make no claim to being an orthodontist,
11 no.

12 Q Same is true for Cannot Match, no
13 experience determining a Cannot Match for an
14 appliance, right?

15 A Yeah, that's correct. I guess my
16 experience is limited to my daughter's experience
17 with braces, but that was a very long time ago.

18 Q Were those wire braces?

19 A Yeah, those were wire braces. It was
20 long before aligners were even conceived, I think.

21 Q Dr. Kimmel, in Paragraph 148 you refer
22 again to the Chen declaration regarding improved

1 performance of ST30 as: A surprising and unexpected
2 result.

3 Do you see that?

4 A Yes.

5 Q For the clinical trial data results that
6 you discuss in the prior paragraphs, you rely
7 entirely on the statements from the Chen declaration,
8 right?

9 A That's correct.

10 Q So your conclusion in 148 regarding the
11 performance being a surprising and unexpected result
12 is based on what you read in the Chen declaration?

13 A She says it was a surprising and
14 unexpected result.

15 Q And you don't have an independent basis
16 to reach that conclusion apart from what you read in
17 the Chen declaration?

18 A No, that's correct.

19 Q Dr. Kimmel, can you grab the '613 patent
20 again, please?

21 A Okay.

22 Q If you look at first page of the patent,

1 do you see a section that says Related U.S.

2 Application Data?

3 A Yes.

4 Q Do you see that under that heading it
5 says: Division of Application No. 13-470,681 --

6 A Yes.

7 Q -- filed on May 14, 2012, now Patent No.
8 9,655,691.

9 A I see that.

10 Q Is it your understanding that the '613
11 patent claims priority to another patent application
12 that issued as Patent No. 9,655,691?

13 A That's my understanding.

14 Q Did you consider the '691 patent in
15 reaching your conclusions regarding secondary
16 considerations in this case?

17 A Yes.

18 Q The '691 patent is not listed in your
19 materials considered, is it?

20 A I don't remember.

21 Q Would you like to take a look? It's at
22 the back of your declaration.

1 A I mean, it's cited in the text.

2 No, it doesn't appear to be cited.

3 Q So did you consider the '691 patent, or
4 no?

5 A I considered it to the point which really
6 doesn't consider its content. It really just
7 considers the fact that the '691 patent is one of the
8 patents that are prior art that Bay Materials
9 compared to its patent, the '630 patent, in the IPR
10 with 3M.

11 And it also states that -- I
12 understand -- that each of the multilayer appliance
13 patents claims priority to the '691 patent.

14 So that's -- that's the extent to which I
15 cite it. It doesn't talk about the content of '691.
16 It just talks about the prosecution history of these
17 patents.

18 Q Because you didn't consider the content
19 of the '691 patent, you didn't consider whether ST30
20 falls within the claims of the '691 patent, right?

21 A We did not consider that.

22 MR. COLLINS-CHASE: I'm at a good

1 deposition today?

2 A What did I do. I read a lot of documents
3 and I met with these guys, the attorneys. So we met,
4 yeah.

5 Q You're referring to Mr. Rosato and
6 Mr. Medley?

7 A And yesterday and the day before Matt
8 Argenti was on -- was with us on-line.

9 Q Did you meet with anybody else besides
10 the individuals who you've mentioned already?

11 A No.

12 Q And you mentioned meeting for a couple
13 days; is that --

14 A Yeah.

15 Q -- a good approximation?

16 A We met for part of Wednesday, a long
17 session yesterday, and -- and we were actually
18 on-line Wednesday, in-person yesterday, but these
19 days it doesn't matter.

20 Q You said you read a lot of documents?

21 A Yes.

22 Q Were the documents all documents that are

1 cited in your declaration?

2 A And in Dr. Osswald's declaration. I went
3 back and looked at some of those.

4 Q They're all -- all the documents that you
5 read in preparation for your deposition are documents
6 that are of record as exhibits for filings in the
7 case?

8 A Yes, they are. They all had exhibit
9 numbers.

10 MR. COLLINS-CHASE: Okay. Well,
11 Dr. Kimmel, thank you. We don't have any
12 additional cross-examination questions
13 for you.

14 THE WITNESS: Oh, okay.

15 MR. ROSATO: Let's take a
16 five-minute break.

17 (Brief pause.)

18 MR. ROSATO: We can go back on.

19 Dr. Kimmel, thank you. We don't
20 have any further questions either.

21 THE WITNESS: Thank you.

22 MR. COLLINS-CHASE: Thank you, sir.

1 Nice to meet you.

2

3 (Thereupon, the deposition was
4 concluded at approximately 1:28 p.m.)

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D I S C L O S U R E

STATE OF GEORGIA) DEPOSITION OF:

FULTON COUNTY) ROBERT M. KIMMEL, SC.D.

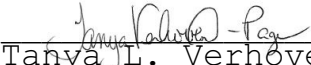
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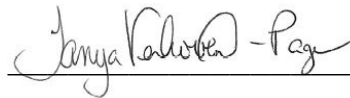
That ROBERT M. KIMMEL, Sc.D., the witness whose
deposition is hereinbefore set forth, was duly sworn
by me before the commencement of such deposition and
that such deposition was taken before me and is a true
record of the testimony given by such witness.

I further certify that the adverse party,
ALIGN TECHNOLOGY, INC., was represented by counsel at
the deposition.

I further certify that the deposition of
ROBERT M. KIMMEL, Sc.D., occurred at the offices
of Finnegan, Henderson, Farabow, Garrett & Dunner, LLP,
271 17th Street, NW, Suite 1400, Atlanta, Georgia,
30363, on Friday, April 17, 2026, commencing at
9:08 a.m. to 1:28 p.m.

1 I further certify that I am not related to
2 any of the parties to this action by blood or
3 marriage, I am not employed by or an attorney to any
4 of the parties to this action, and that I am in no way
5 interested, financially or otherwise, in the outcome
6 of this matter.

7
8 IN WITNESS WHEREOF, I have hereunto set my hand
9 this 22nd day of April, 2026.

10
11 

12 Tanya L. Verhoven-Page,
13 Certified Court Reporter,
14 CCR-B-1790, CSR-12254
15 and LCR-991.

CERTIFICATE OF DEPONENT

I, ROBERT M. KIMMEL, SC.D., hereby certify that I
have read the foregoing pages, numbered 1 through
143, of my deposition of testimony taken in these
proceedings on Friday, April 17th, 2026 and, with the
exception of the changes listed on the next page
and/or corrections, if any, find them to be a true
and accurate transcription thereof.

Signed: _____

Name: ROBERT M. KIMMEL, SC.D.

Date: _____

1 ERRATA SHEET FOR THE TRANSCRIPT OF:

2 Case Name: ClearCorrect v. Align

3 Dep. Date: April 17, 2026

4 Deponent: Robert M. Kimmel, Sc.D.

5 CORRECTIONS

6 Pg. Ln. Now Reads Should Read Reason

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CORRECTIONS

Pg.	Ln.	Now Reads	Should Read	Reason
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