

Patent Owner Align's Oral Argument, July 31, 2026

ClearCorrect Operating LLC v. Align Technology, Inc.
Case No. IPR2025-00817 (U.S. Patent No. 10,791,936)

Grounds of Challenge

Ground	Claims	Invalidity Theory	Prior Art
1	1, 4-6, 8-12, 14-16	Obviousness	Boerjes
2	1, 4-6, 8-12, 14-16	Obviousness	Boerjes in view of Geng
3	2-3, 7, 13, 17-20	Obviousness	Boerjes in view of Babayoff
4	2-3, 7, 13, 17-20	Obviousness	Boerjes in view of Geng and Babayoff

Representative Claim 1

I [pre] A system for scanning a patient's teeth for a dental procedure, the system comprising:

I [a] a hand-held intraoral scanner; and

I [b] a computer readable medium including instructions that when executed by a computer system, cause the computer system to:

I [c] receive first scan data of the patient's teeth from the hand-held intraoral scanner;

I [d] display, to a display, a model of the patient's teeth, wherein the model of the patient's teeth is based on the received first scan data of the patient's teeth;

I [e] **receive user input defining a portion of the model to be removed;**

I [f] remove, from the displayed model, a removed surface portion of the model to be removed according to the user input;

I [g] receive second scan data of the patient's teeth from the hand-held intraoral scanner, the second scan data including surface data of a physically changed portion of the patient's intraoral cavity;

I [h] **replace at least a portion of the removed surface portion of the model using the received second scan data of the patient's teeth including surface data of a physically changed portion of the patient's intraoral cavity; and**

I [i] output, to the display, the model of the patient's teeth with the portion of the removed surface portion replaced using the received second scan data.

The Prior Art's Conventional Approach

Similarly, there are other situations in which a virtual model of a physical item, obtained from scanning the physical item, is partially obscured or incomplete, or in which part of the physical item needs to be subsequently modified after obtaining the virtual model. Such situations would conventionally require a rescanning of the entire physical item, and this may involve significant additional time, inconvenience and, where the physical item is a part of the body of a patient (such as for example the intra oral cavity), this may also involve significant patient discomfort.

EX1001 ('936 Patent), 2:17-22.

The scanning methodology disclosed by the closest prior art, the Kriveshko WIPO reference (WO 2007084647 A2), does not provide for (or suggest) generating a composite scan after intra-oral modifications are made. Rather, it teaches away from this, teaching that entirely new scans should be made.

EX1002 ('936 Pros. His.), 375.

Identification of prior art discussed: Kriveshko, Paley, Rubbert, Babayoff.

Substance of Interview

(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Examiner discussed potential avenues for overcoming the current art with applicant, highlighting features discussed in the specification and clarifying the intended focus of the invention. Applicant provided an in depth explanation of the function of the invention, and examiner noted that highlighting the feature of composite scan updates following modification to the dentition, e.g. after a removal operation was done on a tooth, appeared distinct from the noise/error correction rescans disclosed by the prior art. Agreement was reached that equivalent language would distinguish over the current rejection, and likely over the art as a whole. Examiner noted that if further issues were raised, the applicant would be contacted..

POR, 4-11.



4

EX2014 ('474 Pros. His.), 9.

Ground 1: Petitioner Fails to Show Boerjes Teaches the Claimed Invention

The petition asserts that Boerjes alone teaches elements 1(e)-1(f) and 1(h):

i. Boerjes renders obvious 1[e]-1[f] (Ground 1)

Boerjes's system receives user input defining a portion of the model to be

replaced with new scan data following physical changes to the intraoral cavity. Ex-

Pet., 31.

i. Boerjes discloses and renders obvious 1[h] (Ground 1)

Boerjes discloses, or at least renders obvious, obtaining new (second) scan

data to “replace[]” at least a portion of the removed surface portion of the model

following additional surface preparations of teeth—i.e., after a portion of the

patient's intraoral cavity has been “physically changed.” Ex-1004, [00199]

Pet., 43.

Ground 1: Petitioner Fails to Show Boerjes Teaches the Claimed Invention

The institution decision found Ground I deficient:

Although the Petition is persuasive that Boerjes allows a user to “identify areas that need replacing, such as ‘a margin line’ to be removed, ‘areas of poor margin preparation,’ and ‘holes or areas of incomplete scan[s],’” and that the user can identify regions of a prepared tooth surface requiring additional preparations and “supplemental scanning” (Pet. 32 (citing Ex. 1004 ¶¶ 189, 193, 196)), Boerjes is silent with respect to replacing at least a portion of the removed surface portion of the model using the received second scan data of the patient’s teeth, per claim 1.

Inst. Dec., 18.

Even if, as Petitioner asserts, “removing portions of a virtual model has been a well-known and routine technique in 3D modeling,” and the “process of replacing a user-identified portion would have been well within the skills of a POSITA” (Pet. 35), the disclosure of Boerjes does not teach or suggest such processes. Although Boerjes allows for the *possibility* that portions of a model can be identified as needing replacement or supplementation, it does not disclose the partial replacement required by the instant, independent claims. Boerjes’s actual disclosure details that supplemental scanning is used to compensate for an inadequate scan, but not disclosed to be used to stitch together before-and-after models that have undergone an intervening physical change.

Inst. Dec., 19.

POR, 21, 33.

Ground 1: Petitioner Fails to Show Boerjes Teaches the Claimed Invention

Boerjes teaches following the conventional approach:

[00199] After one or more quality control steps 406-410, a determination may be made as to whether a scan and/or surface preparations are satisfactory. If the data is not satisfactory, the process 400 may proceed to step 414 where the digital model may be supplemented or replaced with new scan data. This may include, for example, new scanning to replace apparently erroneous or inadequate scan data, or **a new scan of the dental subject matter following, e.g., additional surface preparation consistent with errors identified during quality control**. The process 400 may then return to step 404 where a new digital model is obtained.

EX1004 (Boerjes), [00199].

identified during quality control.” *Id.*, [00199] (emphasis added). **A POSITA would have understood from this description that Boerjes is teaching the conventional approach known at the time—i.e., that a new scan of the dental subject matter is obtained following physical modification of the surface preparation.** See EX1001 ('936 patent), 2:17-22 (“Such situations would

EX2011 (Foroosh Dec.), ¶70.

Ground 1: Petitioner Fails to Show Boerjes Teaches the Claimed Invention

Petitioner's reply confirms the petition's deficient case:

Align does not dispute—and the Board preliminarily acknowledged—that Boerjes discloses replacing erroneous or inadequate scan data where the scan is deficient. POR, 34-36, 45; Ex-2011, ¶¶69, 71; Paper 16, 18-19; Ex-1056 (Foroosh

Pet. Reply, 5.

model [to] be supplemented or replaced with new scan data.” *Id.*, 1004, [00199]. A POSITA would have understood that, like the first scan data, the “new scan data” would include surface data of a tooth or preparation captured by Boerjes’s scanner after additional surface preparation (“a physically changed portion of the patient’s intraoral cavity”). *Id.*, [0059]-[0064], [00127]-[00128], [00135].³

Pet.,41.

suitable prosthesis. *Id.* In dentistry, a “preparation” or “surface preparation” refers to the process of shaping and treating a tooth structure before placing a prosthesis, such as a crown, to ensure proper retention, and fit of the prosthesis. *See e.g.*, Ex-

EX1003 (Karam Dec.), ¶138.

Ground 1: Petitioner Fails to Show Boerjes Teaches the Claimed Invention

Petitioner's reply confirms the petition's deficient case:

Q And that new scan data is used to replace apparently erroneous or inadequate scan data.

Correct?

A Correct.

Q And that is a targeted replacement of erroneous data in a digital model. Correct?

A I'm sorry, can you paraphrase that question?

Q That is replacing a partial -- sorry, that's replacing a targeted portion of the digital model that has erroneous data. Correct?

A Where does it say that? No. It doesn't. It says, "The Process 400 may then return to Step 404, where a new digital model is obtained."

EX1056 (Foroosh Dep.Tr.), 172:4-17.

Again, you can see that -- you can verify throughout Boerjes that Boerjes always talk about multiple digital models. And to confirm that, as I said, Figure 4 of Boerjes on Page 133, it shows that obtained digital models.

It doesn't say insert or update or produce composite model. It says, obtain digital models. There are multiple models there.

EX1056 (Foroosh Dep.Tr.), 174:9-15.

Boerjes is not teaching compositing two data -- two models. It's not teaching either that if there is erroneous data, that we should composite the two models. It says that you either

EX1056 (Foroosh Dep.Tr.), 253:7-10.

Ground 1: Petitioner Fails to Show Boerjes Teaches the Claimed Invention

Petitioner's reply confirms the petition's deficient case:

Ex-1056, 173:17-22. Boerjes does not teach that. Align's reading would squander the very efficiency gains Boerjes seeks to achieve, including reducing chair time and improving patient comfort. Ex-1004, [00190], [00198]; Ex-1003, ¶¶60, 90.

Pet. Reply, 7.

[00190] In one aspect, quality control may include real time feedback during a scan, or between successive scans. The feedback may be rendered with suitable visualizations on a display to permit immediate observation and correction by a dentist. Thus it will be appreciate that, while depicted in Fig. 4 as a post-scanning operation, quality control may be implemented at any time in a digital dentistry process, or throughout the entire process. Real time feedback may include for example, textual annotations identifying teeth as they are recognized within a scan, and providing one or more dimensions of a tooth, or an analysis of contour, clearance relative to adjacent teeth, or a position of the tooth relative to other teeth or relative to a global coordinate system. By providing this information in real time within the context of a single dental visit, treatment may be generally improved by reducing or eliminating a need for follow up scans.

EX1004 (Boerjes), [00190].

[00198] Any of the quality control steps above may advantageously be performed while a dental patient is still present at a dental office, or while the patient is still in a dental chair, thus reducing or eliminating the need for follow up dental visits for additional scanning.

EX1004 (Boerjes), [00198].

Ground 2: Petitioner Fails to Show Boerjes and Geng Teach the Claimed Invention

The petition proposes using Geng's tools to perform Boerjes's alleged functionality:

A POSITA would have been motivated to look to Geng, when implementing Boerjes's quality control process, and use Geng's editing function to remove the undesirable portions on the model to improve the efficiency and accuracy of Boerjes's replacement process and improve patient comfort. *Supra* VIII.A.1.f.i; Ex-1003, ¶¶ 100-101.

Pet., 37.

impression.” (emphasis added)). A POSITA would have known to use conventional image-registration methods to replace Boerjes's undesired portion of the model with second scan data. *Supra* V.III.A.1.f. And Geng's merger function would have been a suitable option because it allows for aligning and integrating the second scan data to the existing model in Boerjes. Ex-1003, ¶¶ 120-123. The combined

Pet., 48.

Ground 2: Petitioner Fails to Show Boerjes and Geng Teach the Claimed Invention

Geng teaches conventional editor and merger tools:

The editor (312) can include general-purpose 3D model editing software that allows operators to modify 3D data files interactively and conveniently. The editor (312) allows operators to modify and/or eliminate any undesirable area(s) on the original 3D image obtained from the camera (104; FIG. 1), remove abnormal data point(s), and clean up the acquired image data to reduce the sizes of image data files. 3D objects

EX1005 (Geng), 7:38-44.

The merger (320) provides tools that enable operators to integrate multiple uncalibrated 3D images into a single 3D digital impression (116; FIG. 1). A manual mode requires

EX1005 (Geng), 7:57-59.

61. Moreover, in my opinion, a POSITA would not have understood Geng as describing that its editing tool can be used by a user to remove a portion of a 3D model to be updated with new scan data. Instead, a POSITA would have understood Geng describes that its editor tool serves a cleanup function, such as, noise removal and smoothing, of scan data. EX1005 (Geng), 7:38-51. This

EX2011 (Foroosh Dec.), ¶61.

95. In addition, Geng describes its editor tool and merger tool separately. As I noted above, Geng describes its editor tool as a tool to clean up a scan (*e.g.*, removing noise or removing abnormal or extraneous data points). *Id.*, 7:38-51. Geng separately describes its merger tool as a tool that enables the generation of a 3D model in the first instance. *Id.*, 7:57-59. In fact, as I explain more below, rather

EX2011 (Foroosh Dec.), ¶95.

Ground 2: Petitioner Fails to Show Boerjes and Geng Teach the Claimed Invention

teachings. That is, like Boerjes, Geng's disclosure also comports with the conventional approach at the time that, when a physical structure in the patient's intraoral cavity has been modified, a new scan of that structure of that structure should be performed.

EX2011 (Foroosh Dec.), ¶¶99.

At step (520) of FIG. 5, preliminary imaging of prepared teeth is utilized for treatment preparation. The type of restoration for any individual tooth or group of teeth should be indicated in the treatment plan. This information can be made available to the 3D morphing and prostheses design module (208; FIG. 2) via an interface to a dental practice management application. The standard recommended preparation guidelines for that type of restoration can be stored in the design module (208; FIG. 2) and used as a basis for comparison to the actual preparation. Thus, preliminary imaging of prepared teeth can be utilized for comparison with a predetermined baseline. The comparison can then be used by dentists to check certain factors that can help identify any potential issues that may affect the restoration process. For example, 3D imaging can be used to check alignment, margin design, tooth reduction, and retention and resistance form.

EX1005 (Geng), 11:16-31.

Once the preliminary imaging analysis has been completed, a final 3D image (e.g., the 3D digital impression (116; FIG. 1)) of the prepared teeth may be obtained at step (530) of FIG. 5. This image provides the final image data upon which the restorations will be designed. To help ensure the accuracy of the final 3D image, the system (100; FIG. 1) can implement evaluations steps, which can include but are not limited to confirming correction of any problems found in preliminary imaging, identifying and correcting any artifact data, and verifying and indicating margins.

EX1005 (Geng), 11:65-12:7.

Grounds 3-4: Petitioner's Illogical Motivation to Combine Babayoff

b. A POSITA would have been motivated to use Babayoff's intraoral scanner in Boerjes or Boerjes-Geng

A POSITA would have understood that Babayoff's intraoral scanner would improve the dental restoration procedure of Boerjes or Boerjes as modified by Geng by providing color data for presenting an accurate 3D color model. Ex-1006,

In addition, a POSITA would have understood that Babayoff's intraoral scanner with color scan data would improve Boerjes's automatic identification of the margin line. Babayoff's scanner provides color data of the surrounding soft

Pet., 75.

Q. So both of those benefits that you discuss are based on improving Boerjes or Boerjes plus Geng by adding color scanning; is that right?

A. In these paragraphs, 191 and 192, yeah.

EX2013 (Karam Dep.Tr.), 39:21-24.

Grounds 3-4: Petitioner's Illogical Motivation to Combine Babayoff

[00194] As shown in step 410, quality control may include remote quality control. For example, after completing a scan, a dental office may transmit a digital model to a dental laboratory or a fabrication facility for evaluation of adequacy of the scan. As a significant advantage, the recipient, such as a dental laboratory may provide immediate feedback to a dentist while a dental patient is still in the dental office, or still in a dentist's chair at a dental office, thus avoiding a need to schedule repeat visits for additional surface scanning or surface preparation. A dental laboratory may inspect a prepared surface to ensure that a restoration can be fit to the prepared surface, or that there is adequate space (especially thickness) for a restoration or other dental object. The dental laboratory may also evaluate color and suggest shade matching for a dentist. The dental laboratory may request manual

EX1004 (Boerjes), [00194].

114. In my opinion, Dr. Karam fails to show that a POSITA would have understood that Babayoff's scanner "would improve" Boerjes's system (alone or as modified by Geng) because a POSITA would have recognized that Boerjes's scanner system already captures color scan data for its 3D digital model. For

EX2011 (Foroosh Dec.), ¶114.

- Q. So we looked at the first two sentences and then after that, starting in the third sentence and going on, paragraph 194 provides examples of what could be analyzed remotely, correct?
- A. Just give me a moment to read that. So there are example of how dental apparatus can provide feedback and the feedback on the prepared surface, feedback -- and other feedback also, like color and shade is one of them also and marking of a margin by the dentist also can provide feedback. And other, depending on their standards, including accuracy, the surface quality and so forth and may request additional or new scan data consistent with its own specifications and it goes on also, yeah.
- Q. And that is all feedback that is provided based on the remote analysis of the digital model, correct?
- A. Yes. These are examples of all of this, yes.

EX2013 (Karam Dep.Tr.), 58:1-17.

Grounds 3-4: Claims 7, 13, and 17

7. The system of claim 6, wherein the instructions to replace the at least the portion of the removed surface portion of the model using the received second scan data comprise instructions to further discard a remainder of the received second scan data, the remainder including the identifying surface data, after stitching the portion of the received second scan data with the model.

EX1001 ('936 Patent), claim 7.

VIII.A.1.h.ii. Geng's merger function performs registration by searching for common points based ("identifying data") among multiple images or scans. Ex-1005, 7:57-8:3, Fig. 3. Based on these common points, the multiple images and scans can later be merged together to form one 3D digital representation. *Id.*;

Pet., 54.

[0179]. Babayoff further teaches that it was well known to discard a remainder of received second data. *Id.*, [0177]; Ex-1003, ¶ 199.

Pet., 78.

left-over portion to be disposed of after stitching is completed. Ex-1003, ¶ 200. A POSITA would have been motivated to modify Boerjes or Boerjes-Geng to discard the corresponding points ("identifying surface data"/"identifying data") of the second scan data after registration and stitching, as taught in Babayoff, because they would be repetitive. Ex-1003, ¶ 201. Discarding the repeated data after the

Pet., 78-79.

POR, 50-55.

Grounds 3-4: Claims 7, 13, and 17

[0177] In prior art methods, the overlap zones may be identified by numerically transforming the coordinates of an entity associated with one zone—by a series of translations and rotations—and in each case comparing the data set with the data set of another entity. This process is repeated until at least a portion of the data from the first entity coincides with at least a portion of the data from another entity. At this point, the data sets comprising the two sub-entities can be combined by adding both sets of coordinates, and discarding every data point that is repeated. However, some ambiguity

EX1006 (Babayoff), [0177].

123. In view of this, a POSITA would have understood that, even if the teachings of Babayoff were followed (*i.e.*, discarding those points that are “repeated”), this would still not result in *the remainder including the identifying surface data being discarded*. This is because other data points that form the identifying surface data used to align the data sets (through, *e.g.*, best fit or common geometric features) would not be repetitive. This would be especially

EX2011 (Foroosh Dec.), ¶123.