

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CLEARCORRECT OPERATING LLC,

Petitioner,

v.

ALIGN TECHNOLOGY INC.,
Patent Owner.

Case No. IPR2025-00817
U.S. Patent No. 10,791,936

PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE

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Align did not invent digital dental imaging, user-identified model correction, partial rescanning, intra-procedural physical changes, or post-change rescanning. Pet., 9-15; Ex-1003, ¶¶36-47. Indeed, in the '192 patent IPR, the Board held similar claims reciting replacing user-identified model portions with newly acquired scan data unpatentable. Pet., 6-8; Paper 8, 16-17; *infra* § III. The same conclusion is warranted here.

Align's response rests on the mistaken premise that Boerjes teaches only "entirely new" scans after additional surface preparation. POR, 2-3, 24-27. But Boerjes—which was not before the Examiner—teaches a region-focused quality-control workflow that identifies scan and/or preparation deficiencies, allows for corrective action, and supplements the digital model as needed with new scan data. Ex-1004, [0037], [00139], [00196]-[00199]. Align's reading adds words Boerjes never uses: Boerjes never says that a "new scan of the dental subject matter" must be an "entirely new" scan of the whole dentition. To the contrary, Boerjes states that a scan may capture "some or all" of the dentition depending on the purpose of the scan, and the purpose is to address region-specific errors identified during quality control. *Id.*, [00139], [00196], [00199]. Align's theory that Boerjes only offers "two alternatives" for scanning—partial rescan for scan defects and a full rescan for surface-preparation defects—would force a skilled person to discard satisfactory model data whenever a local surface preparation is corrected, even

though Boerjes's quality-control process identifies local regions and seeks efficient correction. Ex-1004, [00190], [00198]. Nothing in Boerjes or Geng supports Align's inefficient process.

In the Institution Decision regarding Ground 1, the Board preliminarily found that "Boerjes certainly contemplates the re-scanning of the dentition, but does not assert partial insertion of new data into an existing 3D model." Paper 16, 18-19. But even Align agrees that Boerjes discloses partial replacement at least in some contexts. For instance, Align concedes that Boerjes teaches partial insertion when there is an inadequate scan. POR, 24-27, 34-36; Ex-2011, ¶¶69, 71; *see also* Paper 16, 18-19 (Board acknowledging that "Boerjes's actual disclosure details that supplemental scanning is used to compensate for an inadequate scan"). But this teaching of Boerjes is not limited to inadequate scans. A skilled artisan would have understood that it extends to all reasons Boerjes suggests might cause a model to be inadequate, including a portion of the dentition being obscured or needing additional surface preparation. Pet., 31-33, 40-45, 62-64; Ex-1003, ¶¶88-89, 107-110, 158-164.

For Ground 2, Align attacks Boerjes and Geng individually, rather than the combination. Align insists each reference teaches acquiring an "entirely new scan," and neither teaches updating a scan after a physical change. POR, 2-3, 24-27, 33-36, 41-43. But that mischaracterizes the references, ignores the instituted

combination, and ignores the reasons why one skilled would have combined Boerjes and Geng. Paper 16, 20-21. The Board preliminarily found that Boerjes teaches all elements of the representative independent claim except 1[e], 1[f], and 1[h], and that Geng supplies those allegedly missing features. *Id.*, 22-26. The Board also recognized Petitioner’s rationale for combining Boerjes and Geng, and found that Align’s arguments were not directed to that rationale. *Id.*, 23. Align’s response fails to confront those findings, and thus they remain unchallenged.

Align’s remaining arguments likewise fail. Align repackages old arguments, misapplies the obviousness standard, and mischaracterizes Petitioner’s combination. POR, 44-55. Finally, Dr. Foroosh’s testimony cannot resolve these deficiencies and should be given little weight because it rests on an incorrect claim interpretation and lacks proper technical reasoning.

I. Grounds 1 and 2 Demonstrate Obviousness Based on Boerjes Alone or with Geng

A. Boerjes Discloses or Suggests Replacing a User-Identified Portion of the Model After Physical Change

Boerjes teaches identifying “regions” of a model that have scan and/or surface-preparation errors, and replacing the erroneous regions in the 3D model. Pet., 19, 31-33, 40-43; Ex-1004, [0037], [00189]-[00199]; Ex-1003, ¶¶88-89, 107-110, 158-164; Ex-2013 (Karam Tr.), 61:1-23, 72:10-14. Examples of region-specific errors include:

- scan deficiencies, e.g., holes or incomplete areas (Ex-1004, [0037], [0041], [00193], [00195]-[00196]);
- inadequate tooth preparation, e.g., inadequate tooth removal (*id.*, [0037], [0041]-[0042], [00189], [00196], claim 349); and
- inadequate margin lines, e.g., incomplete, inaccurate, or invisible margin lines (*id.*, [00189], [00195]-[00196], claim 156).

Boerjes also recognizes that both scan deficiencies and surface-preparation deficiencies can exist in a single model. *See, e.g., id.*, [00199] (“whether a scan *and/or* surface preparations” are satisfactory (emphasis added)), [00194] (“evaluate suitability of the scan *and/or* surface preparation” (emphasis added)); Ex-2013, 78:5-80:24, 106:16-110:6.

Boerjes teaches acquiring additional or supplemental scans for the regions identified with errors. It explains that, in general, a scan may capture “*some or all* of the dentition according to [the] particular purpose of the scan.” Ex-1004, [00139] (emphasis added). And Boerjes’s claims describe region-specific additional scanning. *Id.*, claim 158 (“acquiring additional three-dimensional representations of *one or more regions* of the one or more intraoral structures” (emphasis added)). Scanning deficient regions as opposed to “all of the dentition” is a *partial* rescan. Pet., 43-45; Ex-1003, ¶¶109-110; Ex-1004, [00199], Fig. 4; Ex-2013, 59:1-62:23, 100:9-105:5. Nowhere does Boerjes mandate an *entire* rescan.

Boerjes’s partial rescan generates “new scan data” to partially replace erroneous regions identified during quality control. Pet., 13-15, 31-33, 40-45; Ex-1003, ¶¶43-47, 88-89, 107-110. If “scan *and/or* surface preparations” are not satisfactory, the process proceeds to step 414 in Figure 4, where “the digital model may be *supplemented or replaced* with new scan data.” Ex-1004, [00199] (emphases added), Fig. 4.

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 Tr.), 169:7-21, 184:5-16, 185:4-17. Align only argues that this partial replacement does not extend to cases involving additional surface preparation. POR, 32-36; Ex-2011, ¶¶83-84. But, as discussed below, Boerjes is not so limited.

B. Align’s “Two Alternatives” Theory Mischaracterizes Boerjes’s Teachings, Lacks Support, and Leads to Absurd Results

Align argues that Boerjes discloses only “two alternatives”: that (1) scan defects may be partially replaced but (2) surface-preparation defects require a full new scan. But Align misreads Boerjes. POR, 24-31, 33-36; Ex-2011, ¶¶69-73, 88; Ex-1056, 169:7-170:12.

Align reads the phrase “a new scan of the dental subject matter” in Boerjes’s ¶199 as referring to the *entire* dentition, repeatedly inserting the word “entirely”

when characterizing Boerjes. POR, 23-27. But Boerjes never says “*entirely*” or “*entire*” new scan. Ex-1004, [00199]. Rather, Boerjes defines the scope of a scan flexibly—a scan “may capture a three-dimensional representation of *some or all* of the dentition according to [the] particular purpose of the scan.” *Id.*, [00139] (emphasis added). Thus, the scope of “the dental subject matter” in the new scan depends on the purpose of the scan.

Boerjes provides examples of the purposes of scans, including a new scan following “additional surface preparation consistent with errors identified during quality control.” *Id.*, [00199]; *see also id.*, [00037], [00196]. As Dr. Karam explained, Boerjes’s quality-control steps identify specific regions with errors requiring corrective action, e.g., “regions of a prepared tooth surface requiring additional preparation or reduction.” *Id.*, [00196]. The corrective action, e.g., additional surface preparation, targets those specific regions, and the subsequent “new scan of the dental subject matter” is, in context, a scan of the dental subject matter that was the focus of the corrective action, not the entire dentition. Pet., 40-45; Ex-1003, ¶¶107-110; Ex-1004, [00196], [00199]; Ex-2013, 59:1-62:23, 73:24-75:7, 110:9-112:24. Indeed, Dr. Foroosh denied that Boerjes’s new scanning after additional surface preparation requires rescanning the *entire* dentition. Ex-1056, 209:2-210:12 (“It doesn’t say, all the teeth, ... part of the dentition. It doesn’t talk about that.”).

Align’s two-alternatives theory also produces absurd results. According to Align, a scan deficiency must be corrected by partial replacement, but a preparation deficiency requires discarding and rescanning the entire digital model. 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.

Dr. Foroosh offered no technical explanation for this rigid two-alternatives distinction. Ex-1056, 186:17-188:8; *see also id.*, 203:12-22. He says that Boerjes discards the old model and creates a new one after additional surface preparation. *Id.*, 173:17-22. But he also admitted that Boerjes does not require the new scan to rescan all dentition in the old model. *Id.*, 208:1-210:12. Both cannot be true. If the old model is discarded and the new scan does not include all previously captured dentition, the resulting “new model” would lose satisfactory data from the old model. A skilled person would not read Boerjes to require this irrational result.

Dr. Foroosh also declined to engage with the practical implications of Align’s two-alternatives theory. When asked what a skilled person would do if both scan and surface-preparation errors were present, Dr. Foroosh stated he was not offering an opinion on that, despite this scenario being expressly contemplated in Boerjes. *Id.*, 220:7-221:4; Ex-1004, [00194], [00199] (“a scan *and/or* surface preparations” (emphasis added)).

Indeed, if quality control identifies both scan and preparation deficiencies in the model, Align's theory would leave a skilled person with no option. Boerjes does not teach that artificial dead end. It teaches exemplary options when "new scan data" is used to supplement or replace the digital model, and the new scan data can be acquired following additional surface preparation. Ex-1004, [00199]. One skilled would have understood that Boerjes teaches, or at least suggests, partial replacement to correct various scan and/or preparation deficiencies in the model. Pet., 31-33, 40-45; Ex-1003, ¶¶107-110; Ex-2013, 73:24-75:7, 110:9-112:24; *see Bradium Techs. LLC v. Iancu*, 923 F.3d 1032, 1049 (Fed. Cir. 2019) (consider prior art "not only for what it expressly teaches, but also for what it fairly suggests"); *Randall Mfg. v. Rea*, 733 F.3d 1355, 1362 (Fed. Cir. 2013).

Notably, Align and Dr. Foroosh do not respond to Dr. Karam's opinions on Boerjes's teaching of partial replacement of erroneous data after a physical change due to objects obscuring the tooth surface in the model. Ex-1056, 162:11-166:14. Dr. Karam explained that objects, such as saliva or debris, can obscure or distort a margin line, generate erroneous data, and require physical removal. Pet., 62-65; Ex-1003, ¶¶158-164. She also explained that a skilled artisan would have understood Boerjes to provide a partial-replacement option to correct a model that is now erroneous due to a physical change (e.g., removing saliva, obtaining new scan data, and replacing the deficient region with new scan data). Pet., 40-47,

62-65; Ex-1004, [00196], [00199]; Ex-1003, ¶¶106-117, 158-164; Ex-2013, 78:13-80:24, 106:16-109:25, 110:9-112:24.

C. [Ground 1] Boerjes Renders Obvious Removing and Replacing a User-Identified Portion of the Model After Physical Change

At minimum, Boerjes renders obvious partial replacement after a physical change. Pet., 13-15, 31-35, 43-47; Ex-1003, ¶¶43-47, 89-96, 109-117.

First, as Dr. Karam explained, Boerjes teaches incrementally registering 3D data to an aggregate 3D model and stitching new 3D data to existing 3D data. Ex-1003, ¶¶43-44, 75, 111-112; Ex-1004, [00144], [00218]; Ex-2013, 111:12-112:24; Ex-1056, 133:8-136:2 (acknowledging Boerjes teaches stitching newly acquired 3D data to existing 3D data). Dr. Karam further explained that it was well known to take additional scans to update, supplement, or replace defective areas in a virtual 3D model using known image-registration and stitching techniques. Ex-1003, ¶¶44-47 (citing background references, including Ex-1015, which teach replacing removed data from one scan with new data from another scan).

Based on Boerjes's teaching of supplementing or replacing the digital model with new scan data, Dr. Karam explained that, once Boerjes's quality control identifies a portion requiring additional surface preparation and obtains new scan data for that portion, a skilled person would have found it obvious to use conventional image-registration and stitching techniques—already taught in

Boerjes—to replace the user-identified portion with the new scan data. Pet., 43-47; Ex-1003, ¶¶109-117; Ex-2013, 110:23-112:24, 116:1-22.

The Petition also explained that a skilled person would have understood to remove the user-identified deficient portion before replacement, as discussed under limitations 1[e]-1[f]. Pet., 31-35; Ex-1003, ¶¶91-96. Once Boerjes’s quality-control process identifies a portion as having a scan deficiency or surface-preparation deficiency, removing that identified portion would have been a suitable, more efficient way to allow new scan data to replace the identified, unwanted data, and would have also avoided further confusion from retaining deficient data. Pet., 31-35; Ex-1003, ¶¶90-96.

Align argues that Boerjes does not say that a user identifies a portion of the model to be replaced or updated after a physical change. POR, 17-18, 26-27. But that ignores Boerjes’s express teaching of “manual quality control” where “a dentist may inspect a scan” (Ex-1004, [00193]-[00197]), identify “regions” with errors requiring corrective action on a scan or a surface preparation (*id.*, [00196]), and acquire “new scanning,” including after “additional surface preparation” (*id.*, [00199]). Align’s approach does not account for an ordinary artisan’s creativity in applying the teachings of Boerjes as a whole. *See* POR, 12-36 (applying a rigid disclosure analysis); *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007) (“a person of ordinary creativity, not an automaton”).

D. [Ground 2] Boerjes-Geng Renders Obvious Removing and Replacing a User-Identified Portion of the Model After Physical Change

Align improperly attacks Boerjes and Geng individually. If, as Align contends, Boerjes alone does not teach partial replacement after additional surface preparation, the Boerjes-Geng combination teaches that in Ground 2. Align cannot rebut Ground 2 by repeating that Boerjes alone allegedly performs an “entirely new scan” after additional surface preparation while ignoring Petitioner’s obviousness rationale for modifying Boerjes with Geng’s editing and merger tools. Petitioner’s Ground 2 obviousness combination and rationale remain unrebutted.

1. Align Fails to Address the Combination of Boerjes and Geng

Align argues that “Boerjes does not describe identifying a particular portion of a model to be replaced with new scan data,” and that “Geng also does not describe that its editing tool allows a user to identify a portion of a 3D model to be replaced with new scan data.” POR, 13-15, 20-22; Ex-2011 ¶¶60-61, 90-96; *see also* POR, 36-39 (arguing references separately). Align’s arguments are unavailing because they fail to address the Boerjes-Geng *combination*. *See In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986) (nonobviousness not shown by attacking references in a combination individually); *In re Mouttet*, 686 F.3d 1322, 1333 (Fed. Cir. 2012).

Both Boerjes and Geng teach intraoral-scanner systems and functionalities to improve efficiency and patient comfort in obtaining an accurate 3D model for dental procedures. Pet., 17-23; Ex-1003, ¶¶57-66. The Petition explained, supported by Dr. Karam, that one skilled would have incorporated Geng's editor and merger tools when implementing Boerjes's quality-control process for obtaining a satisfactory model. Pet., 37-40, 47-51; Ex-1003, ¶¶100-105, 119-123. When an unsatisfactory portion (e.g., unsatisfactory scan and/or surface preparations) was identified in Boerjes and new scan data was obtained to supplement or replace the digital model, Geng's editor would remove the unsatisfactory portion, and Geng's merger tool would align and integrate the new scan data into the model. Pet., 37-40, 47-51; Ex-1003, ¶¶100-105, 119-123.

Align argues that "Geng itself" does not teach replacing a portion of a model after a physical change as in limitation 1[h]. POR, 36-39. But Ground 2 does not rely on Geng alone. Boerjes teaches obtaining new scan data after a physical change and supplementing/replacing the digital model with new scan data when "a scan *and/or* surface preparations" are not satisfactory. *Supra* § I.A; Ex-1004, [00199] (emphasis added). Geng supplies the implementation details for Boerjes's supplementing/replacing the digital model through removal of the unsatisfactory data in the model and integration of the new scan data to the remaining portion of the model. Pet., 35-40, 47-51; Ex-1003, ¶¶97-105, 118-123.

2. Align's Remaining Attacks on Geng Fail

Align argues that Geng's editor tool "serves a cleanup function, such as, *e.g.*, noise removal and smoothing," and does not "allow[] a user to identify a portion of a 3D model to be replaced with new scan data." POR, 20. Geng is not limited to noise removal. Geng teaches that its editor "allows operators to modify and/or eliminate *any undesirable area(s)* on the original 3D image" and use "typical editing functions that provide for deleting, creating, and modifying objects." Ex-1005, 7:40-48 (emphasis added); Pet., 35-36; Ex-1003, ¶¶97-99; Ex-1056, 241:5-242:22 (agreeing Geng's editor tool uses known editing functions, including removing an undesirable area), 247:13-248:13 (Geng's editor tool does not necessarily reduce the image data file size, and can be used to remove "abnormal points ... that require to be removed by the dentist"). A skilled person would have used Geng's editor tool in the same way in Boerjes's similar system to remove the unsatisfactory data in the model. Pet., 37-40; Ex-1003, ¶¶100-105. The Board correctly found that Geng teaches the removal functionality of limitations 1[e], 1[f], and 1[h]. Paper 16, 22-23.

Align also attempts to limit Geng's merger tool to "image acquisition and construction **during** a scanning operation." POR, 31-32. But nothing in Geng limits the merger tool to that context, and its functionality applies equally to integrating later-acquired 3D models into an existing model, as set forth in the

Petition. Pet. 47-51; Ex-1005, 7:57-8:3. Notably, Align does not argue that one skilled would not have expected success in implementing Geng’s editor and merger tools in Boerjes’s system—and in fact concedes that Geng’s editor and merger tools can be used as part of Boerjes’s system. POR, 13-14, 22.

Finally, Align argues that “Geng itself does not even suggest using **its own tools** in the manner suggested by Petitioner” because Geng “follows the conventional approach.” *Id.*, 14, 42-43. This argument fails. First, Geng nowhere teaches performing the alleged “conventional approach”—“an entirely new scan” after a physical change. *Id.*, 2-5. Align points to Geng’s “final 3D image” as the “new scan.” *Id.*, 14, 41-42. But Geng does not describe the “final 3D image” as a complete rescan. Instead, Geng suggests the opposite, teaching the user to interactively evaluate, identify, and correct any artifact data to “ensure the accuracy of the final 3D image.” Ex-1005, 12:2-7; Ex-1056, 238:18-239:15 (confirming Geng teaches identifying and correcting artifact data in the 3D model). Second, Align improperly relies on a rejected legal standard by looking for an express teaching of motivation to combine in Geng itself. *KSR*, 550 U.S. at 419.

3. Align Does Not Rebut Petitioner’s Motivation to Combine Boerjes and Geng

The Petition establishes, supported by Dr. Karam, that one skilled would have implemented Geng’s software tools in Boerjes to improve efficiency and

patient comfort, applying known techniques—Geng’s editing and merger functions—to improve Boerjes’s known and similar system in the same way. Pet., 35-40, 47-51; Ex-1003, ¶¶101-105, 119-123; *KSR*, 550 U.S. at 417.

Align argues that one skilled would not have used Geng’s editor and merger tools in Boerjes because both allegedly follow “the conventional approach”—“an entirely new scan following additional surface preparation.” POR, 19-36, 40-43. Besides mischaracterizing Geng, Align merely concludes that the references cannot be combined because neither reference, viewed alone, discloses the combination. That still attacks the references in isolation.

Even accepting Align’s incorrect premise that Boerjes teaches “an entirely new scan,” that would not undermine the reasons to combine Boerjes and Geng: that one skilled would have used Geng’s editor and merger tools to improve time and cost efficiency and patient comfort in Boerjes, which Align does not dispute. *Id.*, 40-43; Paper 16, 20-23.

E. [Grounds 1-2] Align’s Arguments for Claim 9 Fail

Align’s arguments regarding limitation 9[e] largely repackage its arguments for limitation 1[h] and fail for the same reasons. *Supra* §§ I.C-I.D.

Claim 9 does not survive by virtue of limitation 9[c] either. For limitation 9[c], Align first argues that Boerjes does not disclose identifying a portion to be replaced because it “only generally discusses supplementing an

existing 3D model or replacing it.” POR, 45. This is incorrect (*supra* §§ I.A-I.B) and is at odds with Align’s own admission that Boerjes teaches identifying portions with inadequate scan data for replacement. *See, e.g.*, POR, 18.

Second, Align contests the use of “background references.” POR, 45-46. But Petitioner and Dr. Karam explained that one skilled would have understood, as illustrated by references such as Kriveshko and Kopelman-111, how and why implementing known user-interaction techniques demarcating regions in Boerjes would have been obvious. Pet., 59-60; Ex-1003, ¶¶40-45, 146-148; Ex-1007, [0096], [0101]; Ex-1014, [0078]. This is not gap filling but proper application of well-established background knowledge in the obviousness analysis—demonstrating that user-driven demarcation of regions on a displayed 3D dental model was known, and applying such techniques in Boerjes would have been obvious. *Koninklijke Philips N.V. v. Google LLC*, 948 F.3d 1330, 1337-38 (Fed. Cir. 2020); *KSR*, 550 U.S. at 418 (requiring assessment of “background knowledge”).

Lastly, Align attempts to turn an ordinary and intuitive user-interface implementation into purported patentable significance where none exists. POR, 45-47. As Dr. Karam explained, one skilled would have understood Boerjes’s user interaction with the displayed model as including “marking, circling, outlining, annotating, delimiting, highlighting, or otherwise identifying” the portion to be

replaced, and that, by doing so, the user would also demarcate the portions to be retained. Ex-1003, ¶¶146-148; POR, 5 (Align conceding that marking a portion to be replaced marks a portion to be retained); Ex-1056, 79:6-80:3 (admitting marking a portion to be removed would retain the remaining part); Ex-1001, 20:59-63 (concurrent removing and retaining parts of the model). Dr. Karam further explained that one skilled would have found it useful to show both the portion to be replaced and the portion to be retained once the replacement area was selected. Pet., 59-60; Ex-1003, ¶148; Ex-1014, [0078].

II. [Grounds 3-4] Align’s Arguments on the Boerjes-Babayoff Combinations Are Legally and Factually Wrong

A. Align’s Lack-of-Improvement Argument Misapplies the Law

Align does not contest that Babayoff discloses the scanner features required by the claims. POR, 48-50. Instead, Align tries to defeat the combinations by arguing there was no reason to introduce Babayoff since Boerjes already contemplates color evaluation. *Id.*

But obviousness does not require showing that Boerjes was deficient before adding Babayoff. *United Servs. Auto. Ass’n v. PNC Bank N.A.*, No. 2023-2171, 2025 WL 339662, at *3 (Fed. Cir. Jan. 30, 2025); *Unwired Planet, LLC v. Google Inc.*, 841 F.3d 995, 1002-03 (Fed. Cir. 2016) (rejecting patentee’s argument of no motivation to combine where the first reference had a feature that would already

achieve the claimed functionality). It is enough to show that Boerjes suggests using color-scan data, Babayoff discloses a known and suitable color intraoral scanner, and that a skilled person would have reasons to use that known scanner architecture in either Boerjes or the Boerjes-Geng combination with predictable results. Pet., 75-76; Ex-1003, ¶¶189-194.

B. Align Mischaracterizes How the Remainder Including Identifying Surface Data Is Discarded in the Boerjes-Babayoff Combinations

Align argues that claims 7, 13, and 17 are not obvious based on the same flawed premise that Boerjes does not disclose partial replacement (it does). *Supra* §§ I.A-I.B; POR, 23-27, 34-36, 52; Ex-2011, ¶¶69, 71, 118-119.

Align’s separate arguments on claims 7, 13, and 17 also fail. POR, 50-55. First, Align argues that none of Boerjes’s, Geng’s, or Babayoff’s “stitching” discloses the claimed “identifying [surface] data.” *Id.*, 52-53. But Align again disregards the understanding of one skilled that the registration and stitching techniques in Petitioner’s combinations would use the corresponding points or features (“identifying [surface] data”) in overlapping zones to align and integrate the new scan data with the retained portion of the existing model. Pet. 45-47, 53-55; Ex-1003, ¶¶111-114, 129-133; *Shockwave Med., Inc. v. Cardiovascular Sys., Inc.*, 142 F.4th 1371, 1378-79 (Fed. Cir. 2025).

Align also frames the combinations as discarding repeated data points that

have “one-to-one correspondence” with points in the existing model, and then argues that Petitioner’s combinations would not discard the overlapping dataset used for alignment because that “data set would not be expected to be all repetitive.” POR, 53-54; Ex-2011, ¶121. But that mischaracterizes the Petition. The Petition shows, supported by Dr. Karam, that the remainder to be discarded contains the overlapping portion of the second scan data, which includes the “corresponding points or features” (“identifying data”), because that portion would become redundant once alignment and stitching are complete. Pet., 78-79; Ex-1003, ¶¶70, 200-202; Ex-1006, [0176]-[0177]; Ex-2011, ¶121.

Moreover, Dr. Foroosh’s “highly unlikely” speculation does not defeat obviousness. POR, 53-54; Ex-2011, ¶123. Even “prior art that *sometimes* meet[s] the claim elements [is] sufficient to show obviousness.” *Unwired Planet*, 841 F.3d at 1002 (emphasis added); *Target Corp. v. Proxicom Wireless, LLC*, No. 2022-1282, 2023 WL 6135787, at *5 (Fed. Cir. Sep. 20, 2023).

III. The Board’s Findings in the ’192 Patent IPR Further Undercut Align’s Positions

The Board’s prior determination that similar claims of the parent ’192 patent are unpatentable undercuts Align’s attempt to portray the challenged claims as inventive. The ’192 patent shares the same specification and figures as the ’936 patent, and its claims similarly recite identifying a deficient portion in a first

model, obtaining second 3D scan data, and replacing that portion using second 3D scan data. Ex-1025, claim 1; Ex-1026, 2-3, 20-32, 56-60. The '192 patent's claims also cover partial replacement after physical changes, including removing obscuring material, such as saliva, debris, or blood, and physically modifying a tooth surface for mounting a prosthesis. Ex-1025, claims 13-19.

The Board held those claims unpatentable, finding that prior art taught replacement of defective scan portions of a model after physical changes. Ex-1026, 23-26 (prior art disclosing reacquiring “supplemental 3D scan data” from “the physical part to be modified in the model”), 29-32 (prior art teaching “reacquiring a scan at a point on a model, obtaining new scan data, creating a supplemental 3D model[,] and subsequently fitting the supplemental model data into the original model, i.e., substituting the supplemental model for the defective portion of the first model”), 43-46 (prior art teaching iterative evaluation of “surface preparation and surrounding dentition to ensure adequate physical clearance”), 46-48 (prior art teaching iterative tooth preparation “by removing tooth material and rescanning the tooth surface”); *see also* Pet., 33.

The Board's findings in the '192 patent IPR contradict Align's assertions that the prior art taught only a “conventional approach” of taking *entire* rescans after a physical modification. POR, 2-3, 14, 23-26; *see* PTAB Memorandum (Sep. 16, 2025) (“PTAB consideration of prior findings of fact and conclusions of

law”). In the ’192 patent IPR, the Board already found that user-directed partial rescanning and replacement after a physical change during iterative tooth preparation were known and taught by the prior art. Ex-1026, 23-32, 43-48. The Board also found that replacement through registration of a supplemental model with the original model discloses and renders obvious deleting or removing a portion of the original model. *Id.*, 37-38.

Petitioner’s Boerjes-based grounds are stronger on this point. Boerjes was not before the Office during prosecution of the ’936 patent or during the prior IPRs of the ’936 and ’192 patents. Pet. 2. Boerjes expressly teaches acquiring new scan data where scan and/or preparation deficiencies exist in the original model and supplementing or replacing the original model with the new scan data, including after additional physical preparation. *Supra* § I.A.

IV. The Board Should Give Dr. Foroosh’s Testimony Little or No Weight

A. Dr. Foroosh Applied an Incorrect Claim Interpretation

The Board should give Align’s expert’s testimony no weight because he applied an incorrect, overly narrow claim interpretation that limited the claimed physical change to additional tooth preparation. Ex-2011, ¶66 (“e.g., additional shaping of a prepared tooth surface”), ¶88 (distinguishing “erroneous **scans** versus inadequate tooth preparations”). Align did not seek to construe this term. POR, 12. And in the copending litigation, Align asserts that the challenged claims are

broad, encompassing other types of physical changes. *See, e.g.*, Ex-1057, ¶¶88, 90, 101, 135, 229, 326.

The Petition and Dr. Karam discussed physical changes accordingly—including “additional surface preparation” and other examples of physical change, such as removal of saliva, blood, or debris from a tooth, and explained how such obstructions can result in erroneous data in the scan. Pet., 5-6, 13, 32, 40-42, 62-67; Ex-1003, ¶¶43, 52, 107-110, 155-175; Ex-2013, 106:16-110:6; *see also* Ex-1004, [00189], [00195]-[00196]; Ex-1021, [0102] (noting errors “resulting from blood, saliva, or displaced soft tissue”); Ex-1014, [0023]. This is consistent with the patent. For example, dependent claims 14 and 15 respectively recite a “physical change” that results in the finish line no longer being obscured or distorted and “a physical modification of the surface of the physical preparation.” Ex-1001, 32:1-3, 32:10-12. Accordingly, claim 1, from which claims 14 and 15 depend, encompasses these features. The ’936 specification likewise describes various types of physical changes, including removing or cleaning up material obscuring the surface, such as saliva, blood, soft tissue, debris, or a removable artifact. *Id.*, 12:17-35, 15:40-16:13, 21:4-22:40, 25:55-26:46.

In contrast to the ’936 patent and Align’s own district-court position, Dr. Foroosh repeatedly testified that he did not provide an opinion on any types of physical changes other than “additional surface preparation ... done on [a] tooth.”

Ex-1056, 92:5-93:8, 96:5-100:5, 164:7-166:14. And when asked about the relationship between claim 14's obscured/distorted-finish-line limitation and claim 15's physical-modification limitation, he stated that he "did not opine on that." *Id.*, 94:8-95:9.

Because Dr. Foroosh implicitly applied a claim construction neither party seeks, and as such offered no opinion regarding whether the prior art teaches these claimed limitations under Align's district-court understanding, Petitioner's arguments and Dr. Karam's expert testimony stand unrebutted, and Dr. Foroosh's testimony should be given no weight. *Homeland Housewares, LLC v. Whirlpool Corp.*, 865 F.3d 1372, 1378-79 (Fed. Cir. 2017) (discounting expert testimony based on incorrect claim understanding); *see Satco Prods., Inc. v. Seoul Semiconductor Co.*, IPR2020-00836, Paper 45, 52-53 (PTAB Oct. 22, 2021).

B. Dr. Foroosh's Testimony Is Incomplete, Unreliable, and Conclusory

Dr. Foroosh's testimony is incomplete, unreliable, and lacks the reasoned technical analysis required by 37 C.F.R. § 42.65(a) and FRE 702.

Dr. Foroosh repeatedly emphasized that he was not providing independent skilled-artisan opinions, but only responding to Dr. Karam. Ex-1056, 80:4-81:17, 83:4-86:1, 92:20-93:8, 102:4-107:16, 113:20-115:9, 156:9-157:15. But even then, he only responded to selective portions of Dr. Karam's opinions and evaluations of

the prior art. For example, he only considered the documents cited in his own declaration and did not consider the background references Dr. Karam relied on to show known intraoral-scanning and image-processing techniques for supplementing or correcting inaccurate areas in dental 3D models. Ex-1003, ¶¶43-47; Ex-2011, ¶61; Ex-1056, 14:2-15:10, 24:12-15, 38:9-39:14, 53:4-17. He also declined to address the proper scope of “physical change” or engage Dr. Karam’s other examples of “physical change.” *Supra* § IV.A.

Dr. Foroosh’s testimony is also unreliable. For example, his declaration acknowledges that Boerjes’s “supplement[ing]” option involves “new scanning to replace apparently erroneous or inadequate scan data.” Ex-2011, ¶69. Yet at his deposition, he attempted to recast “supplement[ing]” as maintaining multiple models rather than replacing the erroneous scan data and declined to opine on how the multiple models would be used. *Id.*; Ex-1056, 48:15-51:11. And when asked about the ’936 patent’s teaching that a portion of a model may be undesirable or unacceptable, Dr. Foroosh testified that the “[p]atent never talks about desirability or undesirability.” Ex-1056, 66:7-67:5, 73:16-20. But when confronted with the specification, he reversed course. *Id.*, 90:5-91:14 (“So the patent is giving examples ... why a portion might be unacceptable, and ... that [the] user may identify that [the] data in that portion is unacceptable, and therefore define it as a portion to be removed.”).

When asked where Boerjes supports his two-alternatives theory, he pointed to an unrelated paragraph 32. Ex-1004, [0032]; Ex-2011, ¶78; Ex-1056, 175:11-176:22; POR, 29 n.5. But this paragraph teaches including two 3D models in a dental prescription for fabricating an artificial dental object—not how to obtain a satisfactory model before preparing the prescription. Ex-1004, [0032]-[0035], [00181], [00200]; *Homeland Housewares*, 865 F.3d at 1378-79 (discounting expert testimony contradicting the record); *Interactive Commc’ns Int’l, Inc. v. Blackhawk Network Inc.*, IPR2024-00465, Paper 40, 3-4 (PTAB Oct. 9, 2025) (inappropriate to rely on unreliable expert testimony); *Coal. for Affordable Drugs VI, LLC v. Celgene Corp.*, IPR2015-01096, Paper 76, 6 (PTAB Sep. 8, 2017) (where expert’s opinion “is unsupported by objective evidence, we assign his testimony little weight”); *Semiconductor Components Indus., LLC v. Power Integrations, Inc.*, IPR2016-00809, Paper 72, 7 (PTAB Dec. 22, 2017) (“conflicting testimony diminishes the weight we ascribe to [witness’s] testimony”).

Dr. Foroosh’s selective testimony provides little insight. He declined to answer ordinary technical questions about dental imaging, image processing, and image registration within the undisputed level of skill and his expertise. Ex-1056 21:12-23:7, 28:20-30:7, 194:21-195:18, 197:6-200:8; Ex-2011, ¶¶1-11, 40-43; Ex-2012. He relied on facial readings of Boerjes without technical basis or judgment. Ex-1056, 186:17-187:16 (“Boerjes does what it does.” “I’m not here to

argue why this teaching is the way it is.”), 202:12-203:22 (“I don’t need to understand I’m not here to judge whether Boerjes is doing the right thing or wrong thing or why is he doing [it].”); *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 12, 5 (PTAB Feb. 10, 2023) (Decision by Director) (precedential) (unsupported expert testimony that “adds little to the conclusory assertion for which it is offered to support” is “entitled to little weight”); *Samsung Elecs. Am., Inc. v. Kannuu Pty Ltd.*, IPR2020-00737, Paper 105, 19 (PTAB Sep. 21, 2021) (“To the extent that [the] witness was inadequately prepared, we can account for that in the weight we accord his testimony”).

Dr. Foroosh’s unreliable and conclusory testimony should be given no weight.

V. Conclusion

The Board should cancel each challenged claim.

Dated: May 15, 2026

Respectfully submitted,

/Kathleen A. Daley/

Kathleen A. Daley, Lead Counsel

Reg. No. 36,116

CERTIFICATION UNDER 37 C.F.R. § 42.24(d)

Pursuant to 37 C.F.R. § 42.24(c)(1), the undersigned hereby certifies that the foregoing **Petitioner's Reply to Patent Owner's Response** contains 5,565 words, excluding the parts of this Reply that are exempted under 37 C.F.R. § 42.24(c), as measured by the word-processing system used to prepare this paper.

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CERTIFICATE OF SERVICE

The undersigned certifies that a copy of the foregoing **Petitioner's Reply to Patent Owner's Response** was served on May 15, 2026, via email directed to counsel of record for the Patent Owner at the following:

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