

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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CLEARCORRECT OPERATING, LLC,  
Petitioner,

v.

ALIGN TECHNOLOGY, INC.,  
Patent Owner.

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

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**PATENT OWNER'S PRELIMINARY RESPONSE  
PURSUANT TO 37 C.F.R. § 42.107**

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## **I. INTRODUCTION**

The Board should not institute *inter partes* review of claims 1-20 of U.S. Patent No. 10,791,936 (“the ’936 patent”) because petitioner ClearCorrect Operating, LLC (“ClearCorrect” or “Petitioner”) has not met its burden of showing a reasonable likelihood of prevailing on any of its proposed grounds of unpatentability.

The petition advances four obviousness grounds. All grounds cite, *inter alia*, to Boerjes (International Pub. No. WO 2007/084727). All grounds critically rely on Boerjes as allegedly disclosing the key claimed feature of building a composite model of a patient’s teeth by updating an earlier scan of the patient’s teeth (prior to a physical modification) specifically with portions of a later scan capturing subsequent physical modifications of the patient’s teeth. The claimed step (claim 1[h]) specifically recites “replace at least a portion of the removed surface portion of the model using the received second scan data of a patient’s teeth including surface data of a physically changed portion of the patient’s intraoral cavity.” The relied upon Boerjes reference simply fails to provide this disclosure and the petition fails to demonstrate otherwise.

Independent claim 1 of the ’936 patent is directed to a system for scanning a patient’s teeth, in which scan data is used to generate a model of the teeth, a user identifies a portion of the model to be removed, and new data is obtained

corresponding to the identified portion, with the new data being a scan of a part of the patient's intraoral cavity that has been physically modified. The new scan data is then incorporated into the prior model, replacing the removed portion, to generate a new model.<sup>1</sup>

In a prior IPR of the '936 patent, the Board found that the prior art failed to teach or suggest this limitation. *See 3Shape A/S v. Align Tech., Inc.*, IPR2021-01241, Paper 16 at 15 (Jan. 26, 2022). Not only were critical aspects of the claims missing from the prior art, the Board also acknowledged the lack of any “sufficient non-hindsight biased rationale” to modify the prior art to reach the '936 patent claims. *Id.*, 19. Indeed, during the prosecution leading to the '936 patent the Examiner concluded that the prior art actually undermined any motivation for updating a specified part of an initial scan with new post-change scan data. EX1002, 374-75. The Examiner concluded that the prior art taught that when errors were detected and new data was obtained, one should “generat[e] an entirely new scan rather than generating a composite scan by using a second scan to update the changed region from the first.” *Id.* Boerjes is no different—there is no disclosure of generating a composite scan by using a second scan to update a

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<sup>1</sup> Claims 9 and 17 recite similar limitations, and the petition treats these limitations as interchangeable with those of claim 1.

physically changed region in an earlier (pre-change) scan. Instead, when teeth are modified by further preparation work, an entirely new scan is obtained.

Petitioner does no better here. In each ground, Petitioner relies on Boerjes to teach these steps but fails to support its arguments with actual disclosure in Boerjes. Instead, Petitioner clip-quotes and mischaracterizes Boerjes, and points to attorney-generated annotated versions of Boerjes figures to present a hindsight colored reimagination of Boerjes. The actual content of the Boerjes reference does not support Petitioner's arguments or provide sufficient disclosure to reach the challenged claims.

Accordingly, institution of *inter partes* review should be *denied*.

## **II. OVERVIEW OF '936 PATENT**

The '936 patent describes inventions involving scanning systems and methods used when making preparations for orthodontics and prosthodontics. EX1001, Abstract.

The '936 patent described a process in which scan data is obtained and combined to generate a model of a patient's teeth. *E.g.*, EX1001, Fig. 1, 17:48-67. The user can view the model and indicate areas that should be deleted and replaced with entirely new scan data. EX1001, 20:37-22:29, Fig. 1. This area can correspond to a part of the intraoral cavity that was "physically altered" such as by a "material removal operation" that modifies the topology of the tooth. EX1001,

6:3-12. For example, a dental preparation can be modified (e.g., removing a tooth surface by cutting it down to a different-shaped surface), requiring re-scanning to accurately reflect the resulting tooth shape. *See* EX1001, 16:40-49.

After this physical alteration, the corresponding region—i.e., the region selected by the user—is scanned again to obtain second scan data for a second 3D model. EX1001, 22:36-60, Fig. 1. The second scan data is then incorporated into the first model to form a “composite third 3D virtual model.” EX1001, 22:61-23:26, Fig. 1; *see also id.*, Fig. 9 (describing similar process). This composite model is essentially a kind of “hybrid,” in that part of the model is generated from scan data obtained prior to physically modifying the patient’s teeth and another part of the model (the removed section identified by the user) is generated from data obtained after the physical modification (e.g., after alteration or removal of a surface when changing a tooth preparation).

The above process is reflected in the independent claims of the ’936 patent. For example, claim 1 recites as follows:

1. A system for scanning a patient's teeth for a dental procedure, the system comprising:  
a hand-held intraoral scanner; and  
a computer readable medium including instructions that when executed by a computer system, cause the computer system to:  
receive first scan data of the patient's teeth from the hand-held intraoral

scanner;

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;

receive user input defining a portion of the model to be removed;

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

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;

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

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.

EX1001, claim 1. The other independent claims, claims 9 and 17, are directed to a method or system including similar limitations, which the petition treats as interchangeable with claim 1. *See* Pet., 58-61, 80-80 (tying obviousness arguments for claims 9 and 17 to arguments for claim 1).

### **III. PROSECUTION HISTORY AND PRIOR IPR CHALLENGE**

The Board has already assessed the patentability of the '936 patent in a prior

IPR challenge brought by 3Shape. In that IPR, the Board found that the prior art failed to teach or suggest the limitations of the '936 patent claims, and in particular the limitations relating to generating a composite model. *See 3Shape*, IPR2021-01241, Paper 16 at 15. The Board found that not only did the prior art fail to teach these limitations, but also that there was no “sufficient non-hindsight biased rationale” to modify the prior art to reach the '936 patent claims. *Id.*, 19. The Board also criticized the petitioner for relying on statements from the prior art that were “taken out of context and are insufficient to support the particular modification” required to reach the claims, presenting an inaccurate picture of the prior art’s teachings. *Id.*, 20-21. Petitioner here advances a challenge with similar deficiencies, again presenting a distorted picture of the prior art in an attempt to manufacture a teaching not found in the relied-upon art. *See infra* §V.A.

The prior art’s failure to teach the '936 patent’s claim limitations relating to generating composite models was also recognized during prosecution. During prosecution, the examiner concluded that the prior art undermined any motivation for updating a specified part of an initial scan with new scan data to form a composite model as recited in the claims of the '936 patent. In particular, the Examiner concluded that the closest of several references, “the Kriveshko WIPO

reference (WO2007084647)” (EX2007)<sup>2</sup> taught that when new data was obtained, one should “generat[e] an entirely new scan rather than generating a composite scan by using a second scan to update the changed region from the first.” EX1002, 374-75. The Examiner noted that Kriveshko considered a process of iterative modification of a surface preparation, yet he concluded that Kriveshko nonetheless taught away from compositing new data into an earlier scan, and that it instead taught that only a full new scan should be performed when an update was needed. *See id.* The Examiner then concluded, based on the teachings of the references he considered, that the prior art “explicitly teaches away from the claimed process.” *Id.*

The Board recognized this assessment in the *3Shape* IPR, interpreting the claims by reference to the examiner’s reasons for allowance, which it described as follows:

The Examiner stated that the claims distinguish over the cited art by reciting “updating scans to be directed to scenarios where the intra-oral cavity (e.g. dentition) is modified in between the scans (e.g. subjected

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<sup>2</sup> Kriveshko (EX2007) is a companion application to the Boerjes reference (EX1004), is assigned to the same entity (3M Innovative Properties Company), shares a common priority claim (to US60/761,078), has the same filing date (Jan. 19, 2007).

to surface preparation).” According to the Examiner, the cited art “does not provide for (or suggest) generating a composite scan after intra-oral modifications are made.” When distinguishing the cited art, the Examiner stated that “the instant applications’ claims ... provide a composite scan based on both a first (initial) and second (post-change) scan.” The Examiner characterized the claimed process as follows: “generating a composite scan by using a second scan to update the changed region from the first” and “data is newly captured and composited to update for the intra-oral modification.”

*3Shape*, IPR2021-01241, Paper 16 at 11. Thus, as the Board has already found, the claims distinguish over the prior art by virtue of the composite models they generate, in contrast to the prior art understanding to generate an entirely new model when a prior scan needs to be revised, such as when physical changes to a patient’s intraoral cavity occur.

#### **IV. CLAIM CONSTRUCTION**

As stated in the petition, the court in the related district court proceeding (*Align Technology, Inc. v. ClearCorrect Operating, LLC*, Case No. 6:24-cv-00187-ADA-DTG (W.D. Tex. Apr. 11, 2024)) provided claim constructions for two terms in the ’936 patent. Pet., 16-17 (citing EX1023). The district court subsequently adopted these constructions in its final claim construction order. EX2001.

Regardless, Petitioner insists that no constructions are needed. Pet., 16-17 (citing *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017

(Fed. Cir. 2017); *cf.* Pet., 18 n.5 (tying claim 17 arguments to Petitioner’s proposed construction from district court and arguing no difference in alternative constructions). As explained below, Petitioner fails to meet its burden for any independent claim, as Petitioner fails to show that the Boerjes reference, alone or in combination with Geng or Babayoff, teaches the limitations of the independent claims.

#### **V. PETITIONER’S GROUNDS OF UNPATENTABILITY FAIL**

The petition advances four grounds alleging obviousness of the claims of the ’936 patent. Ground 1 alleges that claims 1, 4-6, 8-12, and 14-16 would have been obvious over International Publication No. 2007/084727 to Boerjes et al. (“Boerjes”). Ground 2 adds U.S. Patent No. 7,474,932 to Geng et al. (“Geng”) to ground 1, but challenges the same claims. Ground 3 alleges that claims 2-3, 7, 13, and 17-20 would have been obvious over Boerjes in view of U.S. Pub. No. 2005/0283065 to Babayoff et al. (“Babayoff”). And like grounds 1 and 2, ground 4 duplicates ground 3 while adding Geng. With regard to the independent claims, claims 1 and 9 are addressed in each of grounds 1 and 2, while claim 17 is addressed in grounds 3 and 4.

These grounds each share common deficiencies related to the disclosure of Boerjes. Each ground purports to show that Boerjes teaches elements common to each independent claim, including the requirement of replacing data selected and

removed from a 3D model with new scan data of a physically changed portion of a patient's intraoral cavity to produce a new model. However, the petition's arguments rely on mischaracterizations of Boerjes's disclosure that attempt to paint Boerjes as teaching limitations it actually lacks.

**A. Ground 1: Petitioner Fails to Show that Boerjes Teaches Elements 1[h] and 9[e]**

In ground 1, Petitioner asserts that Boerjes teaches element [h] of claim 1. Pet., 43-47. Petitioner applies the same reasoning to claim 9. *See* Pet., 60 (“Limitation 9[e] is substantially similar to limitation 1[h].”). However, Petitioner mischaracterizes Boerjes's teachings and fails to show that it discloses or renders obvious this limitation.

Claim 1, element [h] reads as follows:

[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.

EX1001, claim 1. This element requires that a previously generated model (“the model”) be updated by replacing a part of the model with new scan data obtained of physical change to the newly-scanned part of the patient's mouth occurring after data for the original model was obtained (“surface data of a physically changed portion of the patient's intraoral cavity”).

In other words, this element of claim 1 requires producing a new model by combining an existing model with new data of a physically changed portion of the intraoral cavity that replaces removed data from the model. For example, if a patient's dental arch was scanned to generate an initial model, and then one tooth having a preparation had its preparation modified, the tooth could be re-scanned and a new model would be using the new scan data for the prepared tooth and old scan data for the remainder of the arch. *See* EX1001, 16:40-49 ("The real dental preparation is also modified by the dental practitioner ... and thereafter the preparation is scanned in the newly worked area.... The scan data corresponding to the unaltered area is used for aligning the new scan data ... to provide a modified virtual model."). As explained in §II, this describes the formation of a kind of "composite" model composed of pre-modification scan data for some parts and post-modification scan data for other parts.

The petition begins its discussion of element 1[h] by addressing the requirement of a scan of a "physically changed portion of the patient's intraoral cavity," mapping this element to a region in which a tooth preparation is modified, such as by cutting down the surface of a tooth. *See* Pet., 41. However, as explained below, the parts of Boerjes that the petition relies on never disclose building a composite model from a first scan modified to include portions of a second scan following physical changes to the patient's intraoral cavity.

The petition cites to paragraph 199 of Boerjes as purportedly teaching replacement a portion of a model after a physical change (additional preparation). Pet., 43. However, this paragraph does not teach such an operation. Paragraph 199 never says it is building a composite model from two different (physically modified) scans, it provides the following:

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, [00199].

As stated, the only option Boerjes provides following “additional surface preparation” is an entirely new scan of the dental subject matter. There simply is no discussion of replacing a portion of an earlier scan with a portion of a subsequent scan following physical modification of the patient’s intraoral cavity.

Even the limited portion of Boerjes cited by the petition states “[t]his 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.”<sup>3</sup>

EX1004, [00199]. The replacement operation described here does not mention additional surface preparation. Instead, the replacement operation is of *erroneous or inadequate scan data*. Replacing erroneous or inadequate scan data is distinct from performing new scanning subsequent to a physical change to the patient’s intraoral cavity. By contrast, after “*additional surface preparation*” has been performed, Boerjes calls for an entirely “new scan of the dental subject matter”—it never says it is replacing a region or amalgamating with a prior scan. *Id.* By selectively quoting these two alternatives as though they were interchangeable, Petitioner creates the misleading appearance that Boerjes teaches rescanning just a portion of the dental subject matter (e.g., a modified tooth) to create a new model, whereas Boerjes in fact teaches no such thing.

The petition also cites to paragraph 196 (among other paragraphs) as purportedly teaching this step, but this disclosure confirms Boerjes distinguishes between supplemental scanning of the same unmodified dental structure due to incomplete data and, distinctly, obtaining an entirely new scan following additional preparation work. *See* Pet., 45; *see also id.*, 40-41 (citing paragraphs 193, 196, and 199 as purportedly teaching that “a dentist can identify areas that require additional

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<sup>3</sup> Emphases added unless otherwise indicated.

preparations, complete the preparations, and then rescan these areas”). Paragraph 196 states that “an evaluation may conclude with an identification of regions of a prepared tooth surface requiring additional preparation or reduction, or regions of a digital model requiring additional or supplemental scanning due to incomplete, erroneous, or potentially erroneous data.” EX1006, [00196]. Here again, Boerjes’s identification of “regions of a digital model requiring additional or supplemental scanning” is associated with “incomplete, erroneous, or potentially erroneous data,” as opposed to “regions of a prepared tooth surface requiring additional preparation or reduction.” As described in paragraph 199, where there is “additional surface preparation” Boerjes calls for a new scan. *Id.* There is no discussion of constructing a composite digital model from different scans with different surface preparations.

The remaining paragraphs cited by Petitioner also fail to support the specific type of rescanning that Petitioner relies on. Paragraph 193 (cited at Pet., 40-41) describes that the manual quality control step looks for “areas of incomplete scan needed for an intended dental procedure,” saying nothing about partial rescanning subsequent to additional surface preparation and then building a composite model from an earlier scan and a new scan post-modification. EX1005, [00193]. Paragraphs 197 and 198 (cited at Pet., 45) state that different quality control steps are not mutually exclusive and can be performed during a single visit, again adding

nothing more. EX1005, [00197]-[00198]. Paragraph 139 (cited at Pet., 45) indicates that the 3D model can be of “some or all of the dentition according to particular purpose of the scan.” This merely indicates that the model can be some or all of the teeth. There is no discussion of amalgamating different pre and post physical modification scans to build a composite model. EX1005, [00139]. And while Petitioner also cites to an eleven-paragraph block (paragraphs 189-99, cited at Pet., 43) generally discussing Boerjes’s quality control steps, these paragraphs still fail to describe the necessary operations of rescanning *part* of a dentition *after physical modification* to replace *part* of a prior model.

Petitioner also misleadingly cites paragraph 163 of Boerjes as teaching “combining historical three-dimensional data with a three-dimensional representation of the prepared surface.” Pet., 45 (quoting EX1004, [00163]). However, like Petitioner’s other citations to Boerjes for this claim element, the stitched-together partial quotes mischaracterize the actual content of Boerjes. As is readily apparent from the text, Boerjes is discussing fabrication of a “restoration” based on multiple representations. Boerjes does not propose combining these data *into a new composite model*. EX1004, [00163]. In other words, Boerjes is using both a historical model and a new (post-preparation) model *of the entire dental subject matter* to fabricate a temporary or final restoration (e.g., making a crown to match the new preparation surfaces and to fill in the gap to restore the original

tooth surfaces), not combining them to make some new composite dental model.

This disclosure thus fails to teach the type of operation required by the independent claims.

The petition also purports to support its argument using annotations added to Fig. 4 (*see, e.g.*, Pet., 44), but these annotations reflect only Petitioner's mischaracterization of Boerjes, not Boerjes's actual disclosure. For example, on page 44, Petitioner adds an annotation asserting that step 414 in Boerjes's Fig. 4 is to "Receive second scan data including surface data of physically changed portion" and that this is followed with step 404, annotated "Replace user-identified portion of the model using second scan data to obtain a new model." Pet., 44. Boerjes itself says no such thing. Attorney generated annotations are not prior art and should not be treated as such.

Indeed, Petitioner's annotations do not match Boerjes's disclosed quality control steps. Describing these steps, Boerjes states that in "step 414 ... the digital model may be supplemented or replaced with new scan data," which can either be "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.**" EX1005, [00199]. This is followed by "step 404 where a new digital model is obtained." *Id.* Thus, paragraph 199 of Boerjes describes generating a new digital model based on an entirely new scan when the patient's intraoral

cavity is altered, such as by performing additional surface preparation, not receiving “second scan data” of a modified region and replacing a part of the model with the second scan data as Petitioner tries to insert via annotations.

Petitioner’s arguments that a POSITA would have been motivated to use “well-known image registration and stitching techniques as in Boerjes” to “replace at least a portion of the model with a new scan data” does not cure the deficiencies in its challenge. Pet. 45-46. Similar to the discussion above, the petition improperly confuses and conflates (1) updating inadequate scan data or (2) generating an entirely new scan following additional preparation, which are described as different operations in Boerjes, neither of which discloses the limitation recited in element 1[h].<sup>4</sup> Petitioner’s additional arguments present more misleading clip-quotes and mischaracterizations, but the cited content does not remedy Boerjes’s deficiencies.

Specifically, the petition argues “Boerjes discloses registering and combining or stitching 3D data into an aggregate 3D model.” Pet., 45. Each of the cited portions describe image acquisition and construction during a scanning operation. [00126] (“forming a three-dimensional view of a subject reconstructed

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<sup>4</sup> Petitioner does not advance any ground alternatively arguing obviousness to modify Boerjes to include the missing teachings.

from a number of two-dimensional views.”); [00144] (“two dimensional image sets may be forwarded to the computer 108 for derivation of three-dimensional point clouds”); [00218] (“in a system that operates to continuously acquire three-dimensional data in real time, and fits or registers incremental three-dimensional data to an aggregate three-dimensional model...”). There is no disclosure of building a composite model by amalgamating portions of a new scan following physical modification together with an old, pre-modification scan.

The remaining argument and citations are similarly deficient. Petitioner merely cites to numerous paragraphs across several references but provides no content from these references and no explanation how these paragraphs provide anything beyond the general assertion that stitching data during image acquisition was generally known. *See id.* (citing EX1008, [0059]-[0060]; EX1007, [0074], [0086], [0097]-[0101]; EX1015, [0010]-[0014], [0048], [0118]-[0119]). Even if one is to play archeologist with the record, the references Petitioner cites do not speak to building a composite model by replacing a portion of an old scan with a later scan of dentition that was physically changed. Nor does Petitioner assert otherwise—the petition asserts Boerjes discloses building a composite model (it does not) and that additional references generally indicate that “register[ing]” and “stitch[ing]” were previously known. Pet. 46.

Indeed, Petitioner asserts that “a POSITA would have known and been

motivated to use known methods, such as ‘register[ing]’ and ‘stitch[ing],’ as recognized by Boerjes, as part of Boerjes’s replacement of undesirable areas.” Pet., 46; *see also id.*, 46-47 (further asserting motivation to register and stitch scan data). This does nothing to remedy Boerjes’s deficiencies, since the issue is not *replacement of undesirable areas* (e.g., inaccurate data) or *use of registration and stitching* per se. Rather, Boerjes fails to teach or suggest a scanner that can perform the recited operation of making a new model by adding post-modification scan-data to replace corresponding parts of a prior model, thereby producing a new model that is a composite of the pre- and post-modification scans.

In sum, Petitioner fails to show that Boerjes teaches or suggests at least element 1[h]. Petitioner relies on the same arguments for claim element 9[e] (Pet., 60), so its arguments for claim 9 fail for similar reasons. Accordingly, ground 1 fails to show that independent claims 1 and 9, or their dependent claims 4-6, 8, 10-12, and 14-16, were obvious over Boerjes.

## **B. Ground 2: Geng Fails to Remedy Boerjes’s Deficiencies**

In ground 2, Petitioner challenges the same claims as ground 1, adding Geng to Boerjes. Specifically, the petition still relies on Boerjes as allegedly disclosing the elements of claim 1[h], but argues a POSITA “would have been motivated to use Geng’s merger function to replace the first scan’s undesired portion with the second scan data in Boerjes.” Pet. 48. But Geng does not remedy the deficiencies

of Boerjes. As such, Ground 2 thus suffers from the same defects as ground 1.

As explained above for ground 1, Petitioner fails to show that Boerjes teaches element 1[h] or corresponding element 9[e]. *Supra* §V.A. As discussed, Boerjes does not disclose “replacing the first scan’s undesired portion with the second scan data” where the second scan includes a physical modification not in the first scan. Even if a POSITA would be “motivated to use Geng’s merger function,” the relied upon prior art lacks disclosure of the two different scans and resulting composite model required by the challenged claims.

Specifically, for “motivation” Petitioner relies on Geng’s “merger tool” to enable an operator to integrate uncalibrated 3D images together into a single 3D digital impression. Pet., 47. Petitioner asserts that a “POSITA would have been motivated to use Geng’s merger function to replace the first scan’s undesired portion with the second scan data in Boerjes.” Pet., 48. However, this fails to address Boerjes’s failure to teach or suggest that the second scan data would be data of a physically-changed portion to be integrated into a pre-modification model.

Indeed, Petitioner relies on Boerjes, not Geng, for the selection of the new data and the model into which it is to be integrated. In particular, Petitioner asserts that “[t]he combined system would have registered the second scan data to the existing model to replace the undesired, removed portion, thereby obtaining an

updated digital model of the teeth **(e.g., after additional surface preparation, as described by Boerjes)**.” Pet., 49. Petitioner thus confirms that it relies on Boerjes alone, not any teaching of Geng, to teach adding post-modification data to a pre-modification model to form a new model of a patient’s intraoral cavity. Petitioner’s annotation of Boerjes Fig. 4 provides further confirmation, as Petitioner keeps the same (inaccurate) annotations for steps 404 and 414, while adding an annotation to step 408 stating “Incorporate Geng’s editing function that removes user-identified, undesirable portion from the model.” Pet., 50. Thus, ground 2 relies on the same mischaracterization of Boerjes as ground 1, whereas the actual disclosure of Boerjes does not teach the merging pre- and post-modification data to form a new (“composite”) model recited in the claims. The alleged “use [of] Geng’s merger function” does not change this fact. Petitioner still fails to demonstrate that the cited prior art of Boerjes discloses element 1[h] as alleged.

Finally, like in ground 1, ground 2 presents no new arguments regarding independent claim 9’s element 9[e]. See Pet., 60. Ground 2 thus fails for independent claim 9 for similar reasons.

For at least the foregoing reasons, Petitioner fails to meet its burden of demonstrating that claims 1, 4-6, 8-12, and 14-16 were obvious over Boerjes and Geng.

### **C. Grounds 3 and 4: Babayoff Fails to Remedy the Deficiencies of Grounds 1 and 2**

Grounds 3 and 4 both address the same set of claims: claims 2-3, 7, 13, and 17-20. Pet., 69. Each of grounds 3 and 4 adds Babayoff to the corresponding references of grounds 1 and 2. *Id.* Grounds 3 and 4 do not re-argue the obviousness of independent claims 1 and 9; instead they address only dependent claim elements while relying on the analysis of grounds 1 or 2 for each independent claim element. *See, e.g.*, Pet., 69-76 (asserting motivation to use Babayoff's scanner to meet limitations of dependent claim 2, but providing no new argument regarding independent claim 1). Grounds 3 and 4 thus fail to remedy the deficiencies of grounds 1 and 2 with respect to any of dependent claims 2-3, 7, and 13, each of which depends directly or indirectly from independent claims 1 or 9.

The only independent claim addressed by grounds 3 and 4 is independent claim 17. *See* Pet., 80. Aside from claim 17's recitation (element 17[j]) of discarding the remainder of new scan data after replacing original model data corresponding to a "removed surface portion" of the modeled dentition with new data obtained subsequent to the removal of the surface portion, Petitioner does not rely on Babayoff for any part of claim 17. *See* Pet., 82. Indeed, Petitioner's argument in grounds 3 and 4 relies on the remaining elements of claim 17 having the same scope as claim 1. *See* Pet., 80-82 (relying exclusively on ground 1-2 arguments for each claim); *see also id.*, 81 n.5 (advancing ground based on

construction argued in district court that claim 17 requires “physically changed” dentition, as in claim 1). Thus, Petitioner does not rely on Babayoff to remedy the deficiencies of Boerjes and Geng as discussed above for grounds 1 or 2. For example, Petitioner relies on its arguments from ground 1, including its defective arguments regarding element 1[h], for claim 17, with no further explanation or elaboration in grounds 3 and 4. *See* Pet., 82.

Accordingly, Petitioner has failed to meet its burden to show that claims 2-3, 7, 13, and 17-20 were obvious over Boerjes and Babayoff (ground 3) or Boerjes, Geng, and Babayoff (ground 4).

## **VI. CONCLUSION**

Accordingly, for at least the reasons set forth above, institution of *inter partes* review should be denied.

Respectfully submitted,

Date: August 8, 2025

/ Michael T. Rosato /  
Michael T. Rosato, Lead Counsel  
Reg. No. 52,182

### **CERTIFICATE OF COMPLIANCE**

Pursuant to § 42.24(d), the undersigned certifies that this paper contains no more than 14,000 words, not including the portions of the paper exempted by § 42.24(b). According to the word-processing system used to prepare this paper, the paper contains 5,183 words.

Respectfully submitted,

Date: August 8, 2025

/ Michael T. Rosato /  
Michael T. Rosato, Lead Counsel  
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## **CERTIFICATE OF SERVICE**

I certify that the foregoing Patent Owner's Preliminary Response Pursuant to 37 C.F.R. § 42.107 was served on this 8th day of August, 2025, on Petitioner at the following electronic service addresses:

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Respectfully submitted,

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