

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. IPR2025-00816
Patent No. 11,369,456

PATENT OWNER'S RESPONSE

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I. INTRODUCTION

ClearCorrect Operating LLC (“ClearCorrect” or “Petitioner”) challenges claims 1-19 of U.S. Patent No. 11,369,456 (“the ’456 patent,” EX1001) based on two grounds: (1) claims 1-9, 11, 13-17 as obvious over Chishti-511 (EX1004), Chishti-876 (EX1005), and Sachdeva (EX1007); and (2) claims 10, 12, 18, and 19 as obvious over Chishti-511, Chishti-876, Sachdeva, and Becker (EX1006). Pet., 3. Align Technology, Inc. (“Align” or “Patent Owner”) respectfully requests that the Board issue a final written decision rejecting Petitioner’s grounds of challenge and affirming the patentability of the challenged claims.

Petitioner’s grounds of challenge fail because they fundamentally rest on misunderstandings of the prior art and flawed applications of those references to the challenged claims. The challenged claims recite methods for determining a schedule of movement for dental objects during treatment stages of an orthodontic treatment. The claims require, *inter alia*, *identifying a collision* between the dental objects (limitation 1(c)) and *performing a first modification of the schedule of movement in response to the identifying* (limitation 1(d)).¹

¹ Language recited in the challenged claims is italicized throughout this response. In addition, Patent Owner adopts Petitioner’s labeling for the claim limitations.

Ground 1 of the petition asserts that Chishti-511 teaches these limitations based on misunderstanding Chishti-511's determination that a calculated aligner shape is "unacceptable" as somehow including a determination that the schedule of movement will result in a collision. Chishti-511 says no such thing. Chishti-511 simply selects a collision-free path and then calculates candidate aligners to execute that movement. A calculated aligner per Chishti-511 is "unacceptable" if it does not execute the desired movement. Collision detection has nothing to do with whether a calculated aligner in Chishti-511 is "unacceptable"—nor could it, collisions are already eliminated from the equation when deciding the desired movement in the first place. Simply put, blinded by a hindsight-driven attempt to fit the reference to the challenged claims, Petitioner misunderstands and mischaracterizes Chishti-511.

Petitioner's alternative theory asserting Chishti-511 in view of Sachdeva fares no better. Petitioner misunderstands Sachdeva as well. Even Petitioner's own expert distinguished between a "collision" of moving objects (which is never actually mentioned in Sachdeva) and the cited "conflict" where one tooth blocks any movement of another—and possibly even blocks installation of the wire-and-bracket appliance in the first place. When the scope and content of the cited prior art is properly and accurately assessed, Sachdeva, like Chishti-511, fails to provide the disclosure for which it is cited. In addition, Petitioner's flawed reading of the

cited prior art also infects its purported motivation to combine Chishti-511 with Sachdeva, which results in a combination that lacks any rational underpinning. No reasonable combination of the cited art is provided to reach the challenged claims.

For Petitioner's second ground, Petitioner's unsupported assertions regarding the applied art continue. In addition to presenting the same deficient analysis as it does with Ground 1, Petitioner also attempts to shoehorn in the disparate teachings of Becker, despite an express teaching away from the type of movement pattern taught by Becker, as the Board correctly found in its decision on institution.

For these reasons, and as discussed in more detail below, the Board should find that Petitioner has not met its burden to prove that the challenged claims of the '456 patent are unpatentable.

II. PERSON OF ORDINARY SKILL IN THE ART

ClearCorrect, at best, takes inconsistent positions regarding the level of ordinary skill in the art. The petition argument is based on an improper skill level. And the petition never addresses the claims or the prior art from the perspective it previously argued as applicable.

Petitioner here argues that "[a] POSITA pertinent to the '456 patent as of August 30, 2006 (the earliest claimed priority date), would have been part of an interdisciplinary team." Pet., 6. Petitioner asserts that "[t]his team would have

included members with an advanced degree related to dentistry (e.g., BDS, MDS, DDS, DMD) with experience in orthodontics, including 1-3 years of orthodontic training or equivalent experience, and experience using clear aligners.” *Id.*

Petitioner also contends that “[t]he team may have also included members with a degree in a technical area related to software, graphics, computers, or a related discipline,” who “would have had 1-3 years of software development experience.” *Id.*

As noted in the petition, however, in a previous IPR challenging the related U.S. Patent 8,038,444 (“the ’444 patent”), ClearCorrect asserted that a POSITA would have had “a doctorate in dental science and 3-5 years of training and practical experience in orthodontics.”² EX1028, 6; *see also* Pet., 6. In this proceeding, Petitioner now proposes a definition that shifts the level of skill in two ways. One, Petitioner newly contends that the POSITA includes those with

² This is not the only proceeding where ClearCorrect advanced this level of skill. In IPR2016-00270, which challenged another Align-owned patent, ClearCorrect represented to the Board that a POSITA “would have a doctorate in dental science and three to five years of training and practical experience in orthodontics.” EX2017, ¶23 (copy of ClearCorrect’s EX1007, Declaration of Dr. Martin Martz, D.D.S., M.S.).

software development education and training. Pet., 6. Two, with regard to orthodontics, Petitioner now advocates for a level of skill that requires a lesser amount of education and practical training than previously advanced. Pet., 6; *see also* EX1003, ¶27 (Petitioner’s expert arguing that a person with a doctorate in dental science “would be typical of a person with greater than ordinary skill in the art”).

The Director has cautioned against petitioners taking inconsistent litigation positions, absent sufficient explanation on why different positions is warranted. *See, e.g., Revvo Techs., Inc. v. Cerebrum Sensor Techs., Inc.*, IPR2025-00632, Paper 20, 2-4 (Director Nov. 3, 2025) (precedential) (petitioner must explain why alternative positions on claim constructions are warranted). Here, Petitioner only states that “additional information indicates that the level of ordinary skill would include members of an interdisciplinary team” and points to the backgrounds of two inventors listed on the ’456 patent and inventors listed on an applied reference, Sachdeva. Pet., 6-7. However, ClearCorrect’s previous IPR challenge involving the ’444 patent involved the same inventors of the ’456 patent and involved application of substantially the same prior art (*e.g.*, Chishti-511 and Chishti-876). *See* EX1028, 4. Petitioner’s attempt to move away from its own previous position before the Board, including by lowering the level of orthodontic skill required, appears instead to be a litigation-driven tactic—Petitioner’s own orthodontics

expert, Dr. Yadav, lacked the requisite skill by the relevant timeframe. *Cf.* EX1003, ¶¶25-26 (Dr. Yadav asserting that he is qualified “to opine on how a person of ordinary skill in the art would have understood the disclosure” of the patent and asserted references because he obtained his BDS and MDS by August 2006).

Further adding to Petitioner’s confused analysis is the fact that Dr. Yadav proposes an even lower level of skill for the orthodontic POSITA. In particular, while the petition contends that the POSITA would have additionally had experience using clear aligners, Dr. Yadav makes no such assertion. EX1003, ¶24. As Dr. Valley notes, excluding such experience from the level of skill is significant because a person lacking clear aligner experience would have been more prone to overlook fundamental differences in treatment systems known at the time. EX2013, ¶¶32-34. For example, such a person would have failed to appreciate key differences in approaches specifically designed for clear aligners (such as those described in Chishti-511) and those specifically designed for braces (such as those described in Sachdeva) and also would have been more prone to overlook the medical risks or disadvantages for certain treatment approaches that would have been more readily recognized by those with the appropriate training and skill level. *Id.*, ¶¶35, 38. Furthermore, such a person would have similarly failed to appreciate key differences in the purposes of treatment-path planning and aligner-shape

calculation (such as described in Chishti-511) when treating a patient with a clear aligner system. *Id.*, ¶35; *see also id.*, ¶¶36-37 (Dr. Valley noting Dr. Yadav’s lack of experience with clear aligners). Indeed, as detailed more below, Petitioner’s experts exemplify these types of flawed approaches to the prior art, with Dr. Yadav repeatedly misconstruing the art’s teachings and Dr. Clark (Petitioner’s software expert) testifying that a POSITA would have had a reasonable expectation of success for a modification that a POSITA would have never performed.

Petitioner does not allege, let alone show, that the challenged claims would have been obvious under the level of ordinary skill it previously advanced before the Board. *See, e.g.*, EX1003, ¶¶25-26 (Dr. Yadav only asserting ability to opine on POSITA based on having a “Bachelors in Dental Sciences and Master’s in Dental Sciences in Orthodontics” by August 30, 2006, and “treating orthodontic patients since October 2003”); EX2015, 21:8-22:19 (stating same). For this reason, Petitioner’s grounds of challenge should be rejected as facially deficient. Even setting aside Petitioner’s shifting sands POSITA, Petitioner fails to meet its burden in establishing the challenged claims of the ’456 patent obvious over the grounds presented in the petition for the reasons detailed below. *See* EX2013, ¶39.

III. CLAIM CONSTRUCTION

A claim subject to *inter partes* review receives its plain and ordinary meaning, interpreted in light of the specification of the patent in which it appears.

See 37 C.F.R. § 42.100(b); EX2013, ¶¶40-44. While Petitioner identifies constructions for certain claim terms, Patent Owner submits that no terms need to be expressly construed in order to reach a final written decision finding that Petitioner has failed to satisfy its burden in establishing the obviousness of the challenged claims.

IV. OVERVIEW OF THE APPLIED REFERENCES

Petitioner relies on four prior art references (Chishti-511, Chishti-876, Sachdeva, and Becker) to challenge the claims of the '456 patent. Petitioner's ultimate obviousness conclusion is contaminated by a misunderstanding of the applied references. By understanding what each reference teaches and importantly, what it does not teach, Petitioner's errors become apparent. See EX2013, ¶¶45-70.

A. Chishti-511 Concerns the Calculation of Accurate Aligner Designs for Pre-determined, Collision-Free Treatment Paths

Both of Petitioner's grounds of challenge rest on a critical mischaracterization of Chishti-511, infecting both how Petitioner maps Chishti-511 to the claimed limitations and how it combines Chishti-511 with Sachdeva and Becker. Petitioner fails to appreciate that there are two distinct processes involved in Chishti-511's system: (1) a path-determination process that defines "clinically viable" treatment paths, which Chishti-511 discloses as meaning within threshold limits of movement and collision-free; and (2) an aligner-calculation process,

which receives these “clinically viable” paths in order to calculate accurately-shaped aligners that will move the teeth along these paths. EX2013, ¶46.

Petitioner’s challenge improperly confuses and combines these processes, which results in an unsupported reading of Chishti-511 and illogical rationales to modify Chishti-511 in view of Sachdeva and Becker. *See, e.g.*, Pet., 19-21, 36-37, 39; *infra*, §§V.A, VI.

As Dr. Valley explains, Chishti-511’s disclosure is primarily directed to the calculation of aligners that will move teeth along a pre-defined, collision-free treatment path within orthodontically acceptable limits. *See* EX1004, Title (“Defining Tooth-Moving Appliances Computationally”), Abstract, 1:33-43 (stating invention “defin[es] appliance configurations” for “repositioning teeth from an initial tooth arrangement to a final tooth arrangement”), 1:47-49 (invention may be “used to specify shapes for ... polymeric shell appliances”); EX2013, ¶47. The focus of Chishti-511’s invention is to “specif[y] the appliances so that they apply an acceptable level of force, cause discomfort only within acceptable bounds, and achieve the desired increment of tooth repositioning in an acceptable period of time.” *Id.*, 1:59-62.

1. Chishti-511’s path determination process

As described by Chishti-511, the overall process begins with use of a path determination process, which defines “clinically viable” paths of movement that

each tooth will undertake during stages of treatment (which, as described more below, Chishti-511's inventive system uses as an input for calculating a specific aligner shape that will be able move the teeth along the pre-determined paths of each treatment stage). EX2013, ¶48. After obtaining digital data sets representing the initial arrangement of a patient's teeth and their desired final positions, Chishti-511 describes that "a tooth path for the motion of each tooth" is defined. *Id.*, 3:40-4:9; EX2013, ¶¶48-49. This stage of the process is represented by step 150 as shown in FIG. 1, reproduced below.

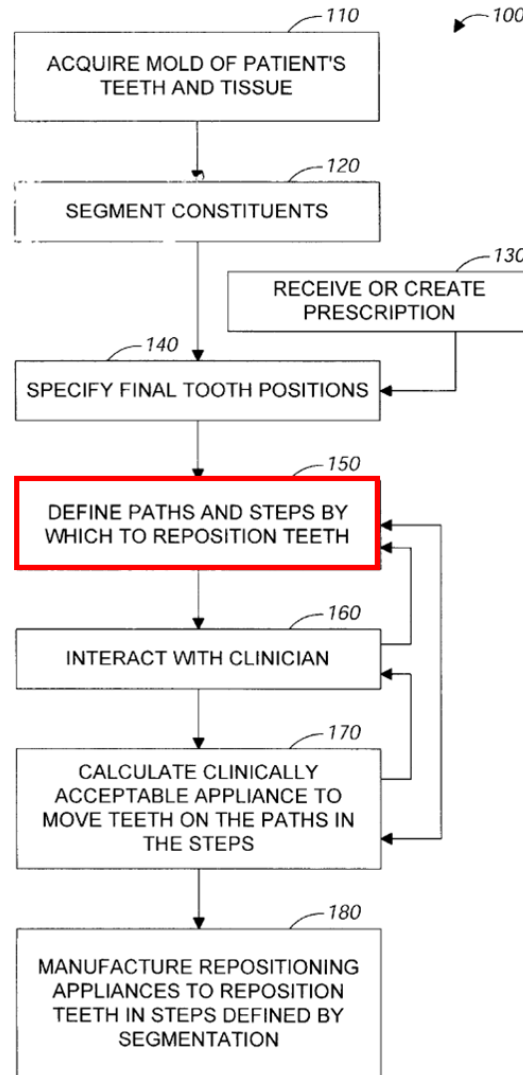


FIG. 1

EX1004, FIG. 1 (annotated); EX2013, ¶51.

In defining a tooth path for each tooth, Chishti-511 explains that “[t]he tooth paths are optimized in the aggregate so that the teeth are moved in the quickest fashion with the least amount of round-tripping to bring the teeth from their initial positions to their desired final positions.” EX1004, 4:9-16; EX2013, ¶49. The tooth paths are then segmented, with the segments being “calculated so that each

tooth's motion with a segment stays within threshold limits of linear and rotational translation.” *Id.*, 4:16-22. This enables each path segment to “constitute a clinically viable repositioning,” with the aggregate of segments “constitut[ing] a clinically viable sequence of tooth positions, so that moving from one point to the next in the sequence does not result in a collision of teeth.” *Id.* Chishti-511 thus describes that, during the path determination process, the system first identifies “a clinically viable sequence of tooth positions” and these tooth paths are “clinically viable” because they move a patient’s teeth within threshold limits of linear and rotational translation and **do not result in a collision of teeth**. EX2013, ¶50.

Petitioner’s own expert Dr. Yadav conceded during his deposition that the “clinically viable sequence of tooth positions” determined at this step means that the tooth paths are within movement limits and are collision-free. See EX2015, 57:12-16 (discussing Chishti-511 at 4:7-22), 59:4-61:13 (stating “clinically viable means within ... the confines and reaching the end position and avoiding collision”), 61:14-62:2 (agreeing that “a calculated segment that would result in a collision would not be a clinically viable segment”), 62:3-12 (agreeing that “the segmentation planning” discussed in Chishti-511 is represented by step 150 of FIG. 1).

2. Chishti-511's aligner calculation process

As Dr. Valley further explains, Chishti-511 describes that these “clinically viable” tooth paths are then used as inputs to the next stage of the process: the calculation of aligner shapes that will move the patient’s teeth along the determined paths. EX2013, ¶52. This stage of the process is represented by step 170, as shown below.

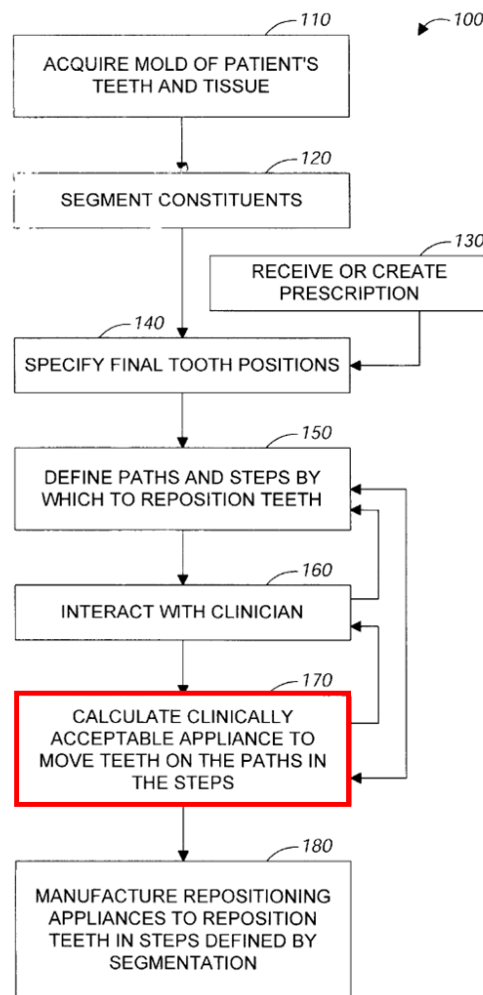


FIG. 1

EX1004, FIG. 1 (annotated); EX2013, ¶52.

Specifically, Chishti-511 explains that “[t]he segmented tooth paths and associated tooth position data are used to calculate clinically acceptable appliance configurations ... that will move the teeth on the defined treatment path in the steps specified by the path segments.” EX1004, 4:51-63; *see also* EX2013, ¶52 (noting the aligner calculation process is used to calculate aligner configurations for manufacture) (citing EX1004, 5:1-3). The purpose of this part of the system is to “compar[e] the actual effect of the appliances with an intended effect of the appliances” and identify[] an appliance as an unsatisfactory appliance if the actual effect of the appliance is more than a threshold different from the intended effect of the appliance and modifying the model of the unsatisfactory appliance according to the results of the comparison.” *Id.*, 2:15-21; EX2013, ¶53.

For example, FIG. 2 of Chishti-511 “illustrates a process 200 implementing the appliance-calculation step” (*i.e.*, step 170 of FIG. 1) “for polymeric shell aligners.” EX1004, 5:7-10. To calculate an aligner shape, the process receives inputs, including an initial aligner shape, various control parameters, and a desired end configuration for the teeth at the end of the treatment path segment being assessed. *Id.*, 5:10-13. The process then runs an analysis using models of the aligner and the patient’s teeth and tissue, with the aligner placed on the teeth. *Id.*, 5:16-21; *see also id.*, 5:60-6:37, FIG. 3 (describing process for generating models). The analysis is used to evaluate the effects of the calculated aligner on the teeth to

determine whether the aligner is able to move the teeth to “the desired end position for the current path segment” and in an “orthodontically acceptable” manner. *Id.*, 5:21-25, 5:27-30, FIG. 2. If the evaluated aligner shape does not result in “an acceptable end position” by the teeth or if “the motions are not orthodontically acceptable,” a new aligner shape is calculated and evaluated. *Id.*, 5:25-27, 5:30-32; *see also id.*, 6:39-8:21, FIGS. 4-5D (detailing process for calculating a new aligner configuration). The process continues until a “best candidate” shape is identified and “the process determines whether it is good enough to be accepted.” *Id.*, 5:35-40; EX2013, ¶54.

After an aligner configuration has been identified for each segment of the treatment path, Chishti-511 explains that the process proceeds to “determine[] whether all of the aligners are acceptable.” EX1004, 8:29-32, FIG. 6; EX2013, ¶55. If there are any unacceptable aligners, Chishti-511 describes that the system may first relax one or more constraints on the aligners, upon which the aligner is recalculated according to the process shown in FIG. 2. EX1004, 8:36-39. Chishti-511 lists that “clinical constraints can include a maximum rate of displacement of a tooth, a maximum force on a tooth, and a desired end position of a tooth.” *Id.*, 2:29-32; *see also id.*, 7:12-17 (describing constraints may also include those related to “manufacturability,” such as maximum or minimum aligner thickness or coverage). Thus, by relaxing such constraints, an aligner that was previously

determined unacceptable (*e.g.*, because it caused a tooth to move at a rate greater than the set maximum, it exerted a force on a tooth greater than the set maximum, or it did not move the tooth within the constraints of a desired end position) can be recalculated as acceptable. EX2013, ¶56.

If any unacceptable aligners remain, Chishti-511 explains that the process determines if “any impossible movements were required,” meaning “if the shape calculation process 200 was required to effect a motion for which no rule or adjustment was available.” EX1004, 8:43-47; *see also id.*, 7:22-51 (providing exemplary rules for defining changes to be made to the aligner under certain events, such as “if the motion of the tooth is too slow,” “if the tooth is too far short of the desired end position,” “if the tooth has been moved too far past the desired end position,” or “if the motion of the tooth is in a direction other than the desired direction”); EX2013, ¶57. In such cases, the process “calculates the configuration of a hardware attachment to the subject tooth to which forces can be applied to effect the required motion.” EX1004, 8:47-50. As Dr. Valley explains, this means that, if the process determines that the path requires a tooth movement that cannot be effectuated by an aligner alone, then an attachment can be added to the tooth to which a force can be applied to perform the required tooth movement. *See id.*, 9:7-14 (stating operator can “defin[e] or select[] suitable attachments to be attached to a tooth or a bone” or “defin[e] an added elastic element to provide a needed force

for one or more segments of the treatment path”); EX2013, ¶58. Only in response to “[i]f no impossible movements were required” does Chishti-511 teach “transfer[ring] control to a path definition process (such as step 150, FIG. 1) to redefine those parts of the treatment path having unacceptable aligners.” EX1004, 8:54-58; EX2013, ¶59.

Thus, in sum, Chishti-511 describes two separate processes as part of its system: (1) in a path determination process, collision-free treatment paths are first calculated; and (2) in an aligner calculation process, functionally acceptable aligners are then designed for moving the teeth along the collision-free paths. EX2013, ¶60. Indeed, Chishti-511 confirms that the process for specifying aligner shapes is distinct from a process for defining tooth paths in orthodontic treatment. *See* EX1004, 1:62-67 (teaching that the invention “can be implemented to interact with other parts of a computational orthodontic system, and in particular to interact with a path definition module that calculates the paths taken by teeth as they are repositioned during treatment”), 2:45-47 (stating invention “can be used to augment a computational or manual process for defining tooth paths in orthodontic treatment by confirming that proposed paths can be achieved by the appliance under consideration and within user-selectable constraints” and allows designers “to finely tune the performance of the aligners with respect to particular constraints”); EX2013, ¶¶60-61.

B. Sachdeva Concerns “Conflict” Identification for Orthodontic Treatments Utilizing Wire-and-Bracket Systems

Sachdeva relates to a system for “simulating tooth movement for an orthodontic patient” in order to provide treatment guidance for orthodontists when using wire-and-bracket systems (*i.e.*, braces). See EX1007, Abstract, 1:12-3:14; EX2013, ¶62. As Sachdeva explains, when using braces, orthodontists typically use their expertise to first mentally map the “desired physical orthodontic structure for the patient” relative to the patient’s initial structure. EX1007, 1:22-27. “Based on these mental images, the orthodontist further relies on his/her expertise to place the brackets and/or bands on the teeth and to manually bend (*i.e.*, shape) wire, such that a force is asserted on the teeth to reposition the teeth into the desired physical orthodontic structure.” *Id.*, 1:27-32. Sachdeva describes that this type of system is a reactive process—that is, “[a]s the teeth move towards the desired location, the orthodontist makes continual judgments as to the progress of the treatment, the next step in the treatment (e.g., new bend in the wire, reposition or replace brackets, is head gear required, etc.), and the success of the previous step.” *Id.*, 1:32-37; *see also id.*, 1:52-55 (orthodontic treatment using braces “is an iterative process requiring multiple wire changes, with the process success and speed being very much dependent on the orthodontist’s motor skills and diagnostic expertise”); EX2013, ¶¶63-64.

Sachdeva teaches that the success of braces is highly dependent on several factors. EX2013, ¶65. For example, braces move teeth to the desired position through the use of brackets bonded to a patient's teeth, which are coupled together with an arched wire that exerts a force on the teeth. *See* EX1007, 1:12-19; EX2013, ¶65. Thus, because brackets represent "the focal point for orthodontic manipulation," "placement of each bracket on a corresponding tooth is critical." EX1007, 2:30-35. Any "misplacement of a bracket by a small amount" creates "a different force system" that is applied to the tooth and, as such, "the tooth will not be repositioned to the desired location." *Id.*, 2:35-43; *see also id.*, 1:27-29 (stating "[t]he orthodontist relies on their expertise to place the brackets and/or bands on the teeth"). In addition, the orthodontist also relies on their expertise to bend the wires, and if the bend is misplaced, this too can result in the tooth not moving towards its desired location. *Id.*, 2:49-51; EX2013, ¶65. Other errors arising in treatments utilizing braces include "loss or attrition of a bracket, bonding failure" and patient-specific factors (*e.g.* anatomical constraints). EX1007, 2:51-56. When such cases occur, the orthodontist must react and "utilize[] his or her expertise to apply manual bends to the wire to 'correct' the errors in treatment." *Id.*, 2:56-58.

Sachdeva therefore describes a system for simulating orthodontic treatment with braces, in an effort to shift the practice of orthodontics "from an art to a science." *Id.*, 3:48-50; *see also* EX2013, ¶66 (citing EX1007, 1:40:52, 1:57-59,

1:60-62, 3:48-50). In particular, Sachdeva describes a system to “simulat[e] tooth movement for an orthodontic treatment” by determining, “on a tooth by tooth basis, a three-dimensional direct path of movement” of a patient’s teeth. *Id.*, 3:33-48; *see also id.*, 4:50-52, 4:54-57; EX2013, ¶67. Sachdeva explains that the process involves determining “whether a conflict in movement arose between at least two teeth during the simulation,” which is resolved by selecting “a priority tooth” for movement. EX1007, 5:3-8; EX2013, ¶67. Sachdeva illustrates what it means by a “conflict” by describing a method for conflict resolution where one tooth is blocking another tooth from movement and the solution is to first move the blocking tooth before the blocked tooth can be positioned. EX2013, ¶68. For example, Sachdeva describes “an intra-arch conflict,” where “the lower tooth protrudes preventing the upper tooth from moving back,” requiring that “the lower tooth must be moved before the upper tooth can be positioned.” EX1007, 5:19-25; *see also* EX2013, ¶68 (explaining that this may generally guide the orthodontist to place lower braces first, before proceeding with upper braces). Sachdeva also describes a “conflict” that “exists for a single tooth,” which can “arise[s] when the tooth cannot obtain its desired position due to distance of movement and treatment constraints.” EX1007, 5:37-45; EX2013, ¶68 (explaining this may generally guide the orthodontist to extract a tooth before placing braces). Sachdeva states, with its simulation, “an orthodontic care giver may simulate the orthodontic treatment as

well as monitor the orthodontic treatment throughout the treatment process.”

EX1007, 6:1-7.

As Dr. Valley notes, and as explained more below, a POSITA would have understood Sachdeva’s simulation as being a generic model that projected the start-to-finish tooth movement for the purpose of providing general guidance to an orthodontist during braces treatment. EX2013, ¶69. A POSITA would not have understood Sachdeva as contemplating the calculating of an individual treatment plan for moving a patient’s teeth over a staged schedule of movement, like treatment plans used for aligner systems. *Id.*; *infra*, §V.A.3.b.

C. Petitioner Relies on Chishti-876 for the Limited Purpose of Teaching Movement Patterns

Chishti-876 describes systems and methods for “prepar[ing] a malocclusion treatment plan by selecting a tooth treatment pattern from a library of predetermined tooth treatment patterns” and “generating the malocclusion treatment plan implementing the selected tooth treatment plan.” EX1005, Abstract; EX2013, ¶70. As the Board correctly acknowledged in the institution decision, “Chishti-876 teaches away from ‘moving a tooth along a distance greater than absolutely necessary to straighten the teeth.’” Inst. Dec., 28 (quoting EX1005, 14:46-51).

In its grounds of challenge, Petitioner relies on Chishti-876 for its disclosure of predefined patterns for moving teeth using clear aligners. For example, with

respect to independent claim 1, Petitioner contends that Chishti-876 allegedly teaches *determining a schedule of movement for dental objects during treatment stages of an orthodontic treatment, wherein the schedule of movement indicates whether or not each of the dental objects moves during each of the treatment stages* (limitation 1(a)). Pet., 32-36. Petitioner also relies on Chishti-876 for teaching certain limitations recited in dependent claims. *See id.*, 50-60, 62-69, 72 (applying Chishti-876 to claims 2-5, 7, 9, and 14). In addition, Petitioner specifically proposes “combin[ing] Chishti-876’s teachings regarding the use of movement patterns and the generation of schedules of movement with Chishti-511’s treatment-planning system” and “combin[ing] Chishti-876’s teachings regarding a schedule of movement indicating whether or not each dental object moves during each of the treatment stages and determining the number of stages.” Pet., 27-30.

As correctly acknowledged by the Board in its institution decision, Petitioner does not rely on Chishti-876 for disclosing identification of collisions and modifications to the schedule of movement as recited in limitations 1(c)-1(g). Inst. Dec., 23 (“Chishti-876 does not appear to be part of Petitioner’s basis for disclosing the disputed limitations” of limitations 1(c)-1(g)); EX2013, ¶71.

D. Petitioner Relies on Becker for the Limited Purpose of Teaching a Specific Tooth Movement Technique Using Braces

Becker is an excerpt from a textbook addressing the orthodontic treatment of a “rare” case involving missing and transposed teeth using braces and other appliances. See EX1006, 191; EX2013, ¶72. In particular, Becker describes treating this uniquely challenging case using a complex appliance design involving mechanically intricate equipment (*i.e.*, a palatal arch for supporting artificial teeth and providing anchorage, along with a labial archwire and bands). See EX1006, 191; EX2013, ¶72.

Petitioner relies on Becker for its Ground 2, alleging that Becker teaches certain round-tripping limitations recited in claims 10, 12, 18, and 19. See Pet., 75-85. Petitioner proposes combining Chishti-511 with Becker based on substantially the same reasoning its proposes for combining Chishti-511 with Sachdeva. See *id.*, 22-27 (“Like Sachdeva’s technique, a POSITA would have been motivated to integrate Becker’s round-tripping treatment technique as an option in Chishti-511’s algorithm for calculating new aligners, such as when it is determined that the aligner is unacceptable (e.g., the treatment plan results in a collision).”).

In its institution decision, the Board found that the petition had failed to make a *prima facie* showing of obviousness by failing to show “that a person of ordinary skill in the art would have had an apparent reason to combine Becker’s round-tripping technique with aligner treatment systems like those taught in the

Chishti patents, particularly in view of Chishti-876's disparagement of round-tripping generally." See Inst. Dec., 25-29.

V. PETITIONER'S GROUND 1 FAILS BECAUSE IT HINGES ON A FLAWED READING OF THE APPLIED REFERENCES

Petitioner's Ground 1 asserts that claims 1-9, 11, and 13-17 are rendered obvious over the combination of Chishti-511, Chishti-876, and Sachdeva. The petition fails to satisfy Petitioner's burden in establishing that the proposed combination renders obvious the challenged claims. The petition's obviousness theory rests on a fundamentally flawed reading of Chishti-511 and Sachdeva that fails to support a finding that the references teach each and every limitation of the claims and fails to support a motivation to combine. EX2013, ¶¶73-74.

For the reasons detailed below, Petitioner fails to meet its burden in establishing the obviousness of claims 1-9, 11, and 13-17.

A. Petitioner Fails to Show Independent Claim 1 Is Obvious Because Petitioner Misconstrues Chishti-511 and Sachdeva and Proposes an Illogical Combination

Petitioner fails to establish that independent claim 1 would have been obvious over the combination of Chishti-511, Chishti-876, and Sachdeva. EX2013, ¶75. First, Petitioner fails to show that either Chishti-511 alone or Chishti-511 in view of Sachdeva teaches *identifying a collision* between dental objects and *performing a first modification of the schedule of movement in response to the identifying*, as recited in limitations 1(c) and 1(d). *Id.*, ¶¶76-78.

For similar reasons, Petitioner also fails to show that either Chishti-511 alone or Chishti-511 in view of Sachdeva teaches *determining that the first modification does not avoid a collision* between the dental objects and *performing a second modification after determining that the first modification does not avoid a collision*, as recited in limitations 1(f) and 1(g). *Id.*, ¶79. Moreover, Petitioner’s purported motivation to combine Chishti-511 and Sachdeva lacks a rational underpinning because it rests on mischaracterizations of the applied art, resulting in an inconsistent rationale to combine, and fails to account for critical differences between the references. *Id.*, ¶80.

1. Petitioner fails to show that Chishti-511 alone or Chishti-511 in view of Sachdeva teaches *identifying a collision and performing a first modification ... in response to the identifying*

Limitation 1(c) of claim 1 requires *identifying a collision between a first of the dental objects and a second of the dental objects based at least on the schedule of movement of the dental objects and the respective treatment paths*. Limitation 1(d) further requires *performing a first modification of the schedule of movement in response to the identifying*. Petitioner asserts that “Chishti-511 alone or in view of Sachdeva” renders these limitations obvious. Pet., 36, 39; EX2013, ¶81.

As explained below, Petitioner fails to establish that Chishti-511 alone teaches limitations 1(c) and 1(d). The petition mischaracterizes Chishti-511’s system by conflating two different processes described in Chishti-511—its initial

path determination process and its subsequent calculation of aligner acceptability—to conclude that Chisht-511’s determination of whether a calculated aligner is acceptable includes identification of collisions between teeth. When read as a whole, Chishti-511 fails to support Petitioner’s strained reading of the reference. See EX2013, ¶¶77, 82-95.

Petitioner also fails to establish that Chishti-511 in view of Sachdeva teaches limitations 1(c) and 1(d). While Petitioner argues that Sachdeva teaches collision identification and avoidance, Sachdeva lacks such express teachings. Sachdeva describes identifying and resolving “conflicts” between teeth for treatments utilizing braces and exemplifies such conflicts as instances where one tooth blocks the movement of another. Petitioner fails to provide sufficient explanation as to how such a “conflict” constitutes *a collision* between dental objects. Moreover, even if a POSITA would have sought to combine Chishti-511 and Sachdeva, Petitioner fails to show that the combination would satisfy each and every limitation of the claimed invention. The identified tooth movement in Sachdeva is a collision-free movement and, even if incorporated as part of Chishti-511’s process for identifying “clinically viable” tooth paths, any modifications to the treatment paths caused by the determination of unacceptable aligners would not be in response to the identification of a collision. EX2013, ¶¶78, 96-104.

- a) Petitioner’s theory that Chishti-511 teaches limitations 1(c) and 1(d) rests on the unsupported assertion that Chishti-511’s determination of unacceptable aligners includes collision identification

Petitioner argues that Chishti-511 teaches *identifying a collision* because “Chishti-511’s solution seeks a ‘clinically viable sequence of tooth positions’ that ‘do[] not result in a collision of teeth’” and “further states that new proposed aligners will be calculated if the system determines that teeth motion is not ‘orthodontically acceptable’ or if ‘an acceptable end position is not reached by the teeth.’” Pet., 36 (citing EX1004, 4:7-22, 5:25-32) (alteration original). Citing only to the testimony of its expert, Dr. Yadav, Petitioner contends that “[a] POSITA would have understood that a schedule of movement resulting in a collision would be orthodontically unacceptable and unlikely to reach an acceptable end position.” *Id.*, 36-37 (citing EX1003, ¶106). Petitioner further argues that Chishti-511 also teaches *performing a first modification of the schedule of movement in response to the identifying* because “Chishti-511 discloses that, when aligners are unacceptable, ‘the process transfers control to a path definition process ... to redefine those parts of the treatment path having unacceptable aligners.” *Id.*, 39 (quoting EX1004, 8:42-61) (alteration original).

Thus, Petitioner’s theory that Chishti-511 teaches limitations 1(c) and 1(d) is based on two primary assertions. First, when Chishti-511 describes that new aligners will be calculated when the system determines that teeth motion is not

“orthodontically acceptable” or “an acceptable end position is not reached,” it means that the system *identif[ies] a collision*. Second, by determining an aligner is unacceptable due to the identified collision, Chishti-511’s system redefines the treatment path having the unacceptable aligner, and thus *perform[s] a first modification to the schedule of movement in response to the identifying*. EX2013, ¶83. Petitioner’s conclusions as to Chishti-511 are unsupported because they rely on and misconstrue quotations cherry-picked from Chishti-511 that describe distinct processes of Chishti-511’s system: its initial path determination process and its process for calculating acceptable aligners. Absent a hindsight-driven, piecemeal mapping of Chishti-511 to the challenged claims, Petitioner fails to point to any objective evidence that would support a finding that Chishti-511’s determination of an unacceptable aligner includes the identification of a collision between dental objects. EX2013, ¶84.

Specifically, as detailed above, Chishti-511 is concerned with computationally designing accurate aligner shapes for moving teeth along pre-determined treatment paths. *See* EX2013, ¶85; *supra*, §IV.A. This is accomplished in two stages. EX2013, ¶85. First, in a path determination process, the system calculates “clinically viable” treatment paths that are within movement constraints and are collision-free. EX1004, 4:7-22, FIG. 1 (step 150). Second, in an aligner calculation process, the system then designs functional aligners that will

move the teeth along these “clinically viable” paths all while “apply[ing] an acceptable level of force, caus[ing] discomfort only within acceptable bounds, and achiev[ing] the desired increment of tooth repositioning in an acceptable period of time.” *Id.*, 1:59-62, 4:51-56, FIG. 1 (step 170); EX2013, ¶85. Indeed, during cross-examination, Dr. Yadav confirmed that there are two distinct processes described in Chishti-511. That is, Dr. Yadav confirmed that step 150 of Chishti-511 relates to the planning of tooth paths, with the goal of defining “clinically viable” tooth paths that are “within the threshold limits of linear and rotational translation and not resulting in a collision.” EX2015, 57:12-62:12. Dr. Yadav also confirmed that step 170 of Chishti-511 relates to the calculation and assessment of aligner shapes and illustrates a “distinction between treatment planning and then designing an aligner to execute that plan.” *Id.*, 62:13-63:15.

By asserting that Chishti-511 teaches *identifying a collision* and *performing a first modification ... in response to the identifying* when the system determines that an aligner is unacceptable and transfers control to the path definition process, Petitioner conflates two separate processes described in Chishti-511. EX2013, ¶86. In addressing these limitations, Petitioner cites to Chishti-511’s description of identifying “a clinically viable sequence of tooth positions” that “does not result in a collision of teeth.” See Pet., 36 (citing EX1004, 4:7-22), 39 (citing same). However, while Chishti-511 describes avoiding collision of teeth, it does so only in

relation to the initial path determination process—*i.e.*, step 150 as shown in FIG. 1. See EX1004, 4:7-22. In contrast, Chishti-511 describes the calculation and evaluation of acceptable aligners (*i.e.*, step 170 of FIG. 1) as a separate process that is distinct from the path determination process. *Id.*, 4:51-56; see also *id.*, 1:59-67 (explaining aligner calculation process can “interact with other parts of a computational orthodontic system,” such as “a path definition module”), 2:45-53 (aligner calculation process can “augment a computational or manual process for defining tooth paths”); EX2013, ¶¶87-88. Chishti-511 does not describe identifying collisions in connection with its aligner calculation process because the preceding path determination process outputs collision-free paths. As a result, there is nothing to suggest that when Chishti-511 teaches transferring control back to the path definition process when an aligner is determined to be unacceptable it is in response to the identification of a collision. EX2013, ¶88.

Nevertheless, Petitioner argues that Chishti-511’s evaluation of calculated aligner shapes involves *identifying a collision* based on Chishti-511’s description that an aligner is determined to be unacceptable when “the system determines that teeth motion is not ‘orthodontically acceptable’ or if ‘an acceptable end position is not reached by the teeth.’” Pet., 36 (citing EX1004, 5:25-32). Although Petitioner asserts that “[a] POSITA would have understood that a schedule of movement resulting in a collision would be orthodontically unacceptable and unlikely to reach

an acceptable end position,” this assertion rests entirely on the conclusory testimony of Dr. Yadav. *Id.* (citing EX1003, ¶106). Chishti-511 does not describe the terms “orthodontically acceptable” or “an acceptable end position” as including the identification of a collision between teeth. EX2013, ¶89. As noted above, Chishti-511 mentions the word “collision” once and it is solely in relation to the path determination process, not for the process of evaluating the acceptability of aligners. *Id.*

Indeed, as Dr. Valley explains, Petitioner’s conclusory assertion fails to comport with Chishti-511’s description. EX2013, ¶90. As explained above, Chishti-511 first describes identifying path segments that are “clinically viable,” meaning the path segments are within limits of movement and “do[] not result in a collision of teeth.” EX1004, 4:15-22; *see also* EX2015, 61:11-17 (“clinically viable means within ... the confines and reaching the end position and avoiding collision”). Chishti-511 further explains that these “clinically viable” path segments are used as input for “calculat[ing] clinically acceptable appliance configurations ... that will move the teeth on the defined treatment path in the steps specified by the path segments.” EX1004, 4:51-56; *see also id.*, 2:45-50 (explaining purpose of aligner calculation process is to “confirm[] that proposed paths can be achieved by the appliance under consideration”). In other words, Chishti-511’s calculation process for determining acceptable aligners is operating

on path segments in which the teeth are moving in a collision-free manner.

EX2013, ¶90. Thus, contrary to Petitioner’s assertion, a POSITA would not have understood Chishti-511’s determination of whether an aligner results in motions that are not “orthodontically acceptable” or do not reach “an acceptable end position” to mean that a schedule of movement results in a collision because the aligner calculation process is acting on a schedule of movement that already **avoids** collisions.³ EX2013, ¶91.

Other parts of Chishti-511’s description undermine Petitioner’s assertion that a POSITA would have understood an aligner shape that was not “orthodontically acceptable” or does not reach “an acceptable end position” means that a schedule of movement results in a collision. EX2013, ¶92. For example, Chishti-511 explains that appliances are specified so that they “apply no more than

³ Indeed, further supporting this conclusion is the fact that Chishti-511 teaches that if a calculated aligner shape does not reach “an acceptable end position” or is not “orthodontically acceptable,” then the first step is to calculate **a new aligner shape**, not calculate a new path that would avoid any supposed collision. See EX1004, 4:25-27 (“If an acceptable end position is not reached by the teeth, the process calculates a new candidate aligner shape.”), 4:30-32 (same for orthodontically acceptable), FIG. 2; EX2013, ¶91.

orthodontically acceptable levels of force, cause no more than acceptable amount of patient discomfort, and achieve the desired increment of tooth repositioning in an acceptable period of time.” EX1004, 2:41-45; *see also id.*, 1:59-62 (stating same); EX2015, 56:12-57:13 (Dr. Yadav agreeing this portion of Chishti-511 is referring to the acceptability of aligners). Chishti-511 also describes “evaluating the effect” of an aligner “against clinical constraints,” which can include “a maximum rate of displacement of a tooth, a maximum force on a tooth, and a desired end position of a tooth.” EX1004, 2:8-11, 2:30-34; *see also id.*, 9:17-35 (explaining that input parameters for assessing aligner acceptability include “a specification of the forces and positioning motions and velocities that are orthodontically acceptable”).

As Dr. Valley explains, based on this description, a POSITA would have understood that, when Chishti-511 discusses assessing whether an aligner shape is “orthodontically acceptable” or reaches “an acceptable end position,” it means assessing whether the aligner shape can successfully move the tooth along the segmented path to an acceptable end position using an acceptable level of force over an acceptable period of time. EX2013, ¶93. Only if no aligner shape is found to be capable of achieving the segmented movement under the specified constraints (and if there are no impossible movements to which no shape calculation rules apply), does Chishti-511 teach “transfer[ring] control to a path definition process

(such as step 150, FIG. 1) to redefine those parts of the treatment path having unacceptable aligners.” EX1004, 8:54-58; *see also id.*, claim 5 (claiming calculation of “a new segmentation” when it is determined “that the forces that can be generated by the appliance on the then-existing configuration of teeth is incapable of effecting the repositioning that is represented by the treatment segment”); EX2013, ¶93.

In view of the above, Petitioner fails to establish that Chishti-511 teaches *identifying a collision and performing a first modification ... in response to the identifying* because Chishti-511 fails to support the assertion that when the system determines that an aligner is unacceptable, it means that the schedule of movement results in a collision. Thus, any modification to the treatment paths due to Chishti-511’s system determining that an aligner is unacceptable is **not** in response to identifying a collision because (1) the aligner calculation process is acting on paths that are already **collision-free** and (2) treatment paths are only recalculated in response to the failure to identify a workable aligner that can acceptably move the teeth along a given path. EX2013, ¶¶94-95.

Accordingly, Petitioner fails to establish that Chishti-511 teaches limitations 1(c) and 1(d).

b) Petitioner fails to show Chishti-511 in view of Sachdeva teaches limitations 1(c) and 1(d)

Implicitly conceding Chishti-511's shortcomings, Petitioner also argues that Chishti-511 in view of Sachdeva teaches limitations 1(c) and 1(d). *See* Pet., 36, 39. In particular, Petitioner contends that a POSITA "would have been motivated to modify Chishti-511 to include Sachdeva's collision-identification teachings." *Id.*, 37. Petitioner argues that Sachdeva's "treatment-planning system" involves *identifying a collision* between dental objects when the system "determines if 'a conflict in movement arose between at least two teeth.'" *Id.*, 37-38. Petitioner further argues that Sachdeva performs *a first modification* through its selection of a "priority tooth" for movement. *Id.*, 41; *see also id.*, 43 (discussing Sachdeva's movement of a lower tooth prior to positioning an upper tooth).

As explained below, Petitioner fails to meet its burden in establishing that Chishti-511 in view of Sachdeva teaches limitations 1(c) and 1(d) because Petitioner fails to show that Sachdeva describes identifying *a collision* and also fails to show that combining Chishti-511 and Sachdeva would satisfy the limitations of the claimed invention. EX2013, ¶¶96-97.

First, Sachdeva does not describe its process as *identifying a collision* between dental objects. *Id.*, ¶98. Rather than mentioning the word *collision*, Sachdeva instead discusses determining whether "a conflict" exists between teeth. EX1007, 4:50-5:8; *see also supra*, §IV.B. When describing what constitutes "a

conflict,” particularly one that occurs between two teeth (which Sachdeva describes as “an intra-arch conflict”), Sachdeva provides a scenario in which a tooth is blocking the path of another tooth and establishing priority of movement for the blocking tooth.⁴ EX2013, ¶98. For example, Sachdeva explains that “[i]f the lower tooth protrudes preventing the upper tooth from moving back, the lower tooth must be moved before the upper tooth can be positioned.” EX1007, 5:22-26 (“Conversely, if the upper tooth is interfering with the lower tooth from being moved out, the upper tooth must first be moved.”); *see also* Pet., 43 (relying on this example as describing the claimed *first modification*). Thus, Sachdeva describes that “a conflict” may exist where one tooth cannot be moved because another tooth is blocking its path, which necessitates that the blocking tooth be moved first before the blocked tooth can be positioned. EX2013, ¶99. As Dr. Valley notes, the scenario described in Sachdeva is one where no movement is possible and, given Sachdeva’s context of providing guidance to orthodontists during braces treatment, would have indicated to a POSITA that this scenario would have

⁴ As noted above, the only other example of a “conflict” described by Sachdeva is one that “exists for a single tooth,” which “arises when the tooth cannot obtain its desired position due to distance of movement and treatment constraints.” EX1007, 5:37-44; *supra*, §IV.B; EX2013, ¶100.

indicated to a POSITA that lower braces should be prioritized before upper braces.
Id.

Petitioner fails to explain how “a conflict” as described in Sachdeva in which a stationary tooth cannot move because another tooth blocks its path constitutes *a collision* between teeth. Indeed, as Petitioner’s expert, Dr. Yadav, admitted, a collision necessarily involves moving objects and, by logical extension, stationary objects cannot collide. *See* EX2015, 47:20-48:6 (agreeing that a collision is when “[o]ne moving tooth strikes against another”), 54:5-16 (“if you’re not moving [] teeth, you’ll avoid a collision”). Dr. Yadav also agreed that Sachdeva’s discussion of an intra-arch conflict relates to where “a lower tooth that protrudes and blocks movement of the upper tooth,” making the “conflict” one where “the lower tooth is preventing the movement of the upper tooth.” *Id.*, 79:10-17. Thus, the evidence fails to support the assertion that Sachdeva teaches identification of *a collision*.

Second, Petitioner fails to show that, even if combined, the combination of Chishti-511 and Sachdeva would satisfy limitations 1(c) and 1(d). EX2013, ¶101. For example, Petitioner relies on Sachdeva’s identification of the above-described intra-arch conflict as satisfying the claimed *first modification* performed in response to a collision identification. *See* Pet., 43 (citing EX1007, 5:9-26). However, Petitioner fails to establish that Sachdeva’s “conflict” and its resolution

is a modification of the schedule of movement in response to the identification of a collision because the movement identified in Sachdeva is a collision-free movement. EX2013, ¶101. That is, the nonpriority tooth (*e.g.*, the upper tooth) cannot move due to the priority tooth (*e.g.*, the lower tooth) blocking its path, making a collision not possible since no movement is possible. *Id.*; *see also* EX2015, 47:20-48:6 (a collision requires a moving tooth), 54:5-16 (“if you’re not moving [] teeth, you’ll avoid a collision”), 79:10-17. Moreover, Sachdeva’s resolution to such a “conflict” is to move the blocking tooth (*i.e.*, the priority tooth) out of the way, which also is collision free. EX2013, ¶101. Thus, even if Sachdeva’s “conflict” identification and resolution were incorporated into Chishti-511, it would, at best, constitute a collision-free movement acceptable in Chishti-511’s initial path determination process, not a *modification* in response to collision detection. *Id.*

Furthermore, in discussing motivation to combine, Petitioner argues that a POSITA would have sought to combine Sachdeva with Chishti-511 because Sachdeva would help “achieve ‘the ‘clinically viable sequence of tooth positions’ sought by Chishti-511.” Pet., 20. Thus, when arguing why a POSITA would have sought to combine Chishti-511 and Sachdeva, Petitioner takes the position that a POSITA would have found it beneficial to use “Sachdeva’s collision-identification

process” when Chishti-511 determines the “clinically viable sequence of tooth positions”—*i.e.*, during step 150 of Chishti-511.⁵ EX2013, ¶102.

However, even assuming that a POSITA would have been motivated to use Sachdeva’s techniques as part of Chishti-511’s determination of “clinically viable” tooth positions and even assuming that Sachdeva’s techniques identify and resolve *a collision* between teeth, this combination would fail to satisfy the limitations of the claim. EX2013, ¶103. Specifically, Petitioner maps the claimed *first modification* (limitation 1(d)) to Chishti-511’s determination that a calculated **aligner** is unacceptable. *See* Pet., 39-40 (arguing that “Chishti-511 discloses that, when aligners are unacceptable, ‘the process transfers control to a path definition process ... to redefine those parts of the treatment path having unacceptable aligners’”) (citing EX1004, 8:42-61). Because Chishti-511 teaches determining clinically viable positions that are **collision-free** before proceeding with the aligner calculation process, Sachdeva’s techniques, at best, would resolve any alleged collisions **before** aligner shapes are assessed. EX2013, ¶103. As such, any

⁵ As discussed in more detail below, Petitioner takes conflicting positions on how a POSITA would have modified Chishti-511 in view of Sachdeva, which also provides an independent basis for finding that Petitioner has failed to satisfy its burden in establishing obviousness. *Infra*, §V.A.3.a.

modification to the schedule of movement due to **a determination of an unacceptable aligner** (*i.e.*, the purported *first modification* as advanced by Petitioner) would not be *in response to the identifying* of a collision, as required by the claim. *Id.*, ¶¶103-04.

Accordingly, for these reasons, Petitioner fails to establish that Chishti-511 in view of Sachdeva teaches limitations 1(c) and 1(d).

2. Petitioner fails to show that Chishti-511 alone or Chishti-511 in view of Sachdeva teaches limitations 1(f) and 1(g)

Limitation (f) recites *determining that the first modification does not avoid a collision between the first of the dental objects and the second of the dental objects*. Limitation (g) further recites *performing a second modification of the schedule of movement after the determining that the first modification does not avoid a collision*. Petitioner alleges that “Chishti-511 in view of Sachdeva” render these limitations obvious. *See* Pet., 44, 48. In asserting that Chishti-511 and Sachdeva teach limitations (f) and (g), Petitioner relies on the same aspects of Chishti-511 and Sachdeva that were relied upon as allegedly teaching limitations 1(c) and 1(d). EX2013, ¶¶105-06.

Specifically, Petitioner argues that Chishti-511 teaches *determining that the first modification does not avoid a collision* because “Chishti-511 discloses that ‘[a]fter the treatment path has been redefined’ to account for the unacceptable aligners, the process is re-executed to ensure all aligners are now acceptable (e.g.,

collisions have been resolved and there are no further collisions).” Pet., 44 (citing EX1004, 8:54-9:14) (alteration original); *see also id.*, 45 (“Thus, the same steps of the combined system discussed in limitations 1(c)-1(d) will be iteratively performed to determine whether the treatment plan is acceptable.”), 48 (arguing that, “similar to limitation 1(d), the combination likewise includes performing a second modification ‘to redefine those parts of the treatment path [still] having unacceptable aligners”). However, for the same reasons discussed above with respect to limitations 1(c) and 1(d), Petitioner fails to establish that Chisti-511 teaches *determining ... a collision* and *performing a second modification of the schedule of movement after the determining that the first modification does not avoid a collision*. EX2013, ¶107.

As explained above, Chishti-511 teaches that its path determination process identifies clinically viable path segments that will avoid collisions, which are used as inputs for its aligner calculation process in identifying an aligner shape that will be able to move the teeth along the clinically viable path segment within acceptable constraints. *Id.*, ¶107. Thus, because Chishti-511’s calculation of aligner shapes already involves collision-free paths, there is nothing in Chishti-511 to support a conclusion that a schedule of movement will result in a collision when an aligner shape is identified as unacceptable. *Id.* As a result, any modification to the treatment paths based on a determination that an aligner shape is unacceptable

is **not** due to determining that the first modification does not avoid a collision.⁶ *Id.* Moreover, for the same reasons discussed above with respect to limitations 1(c) and 1(d), Petitioner also fails to show that Sachdeva describes identifying *a collision* and fails to establish that the combination of Chishti-511 and Sachdeva satisfies the limitations of the claim. *Id.*, ¶¶107-08.

Accordingly, for these reasons, Petitioner fails to establish that Chishti-511 in view of Sachdeva teaches limitations 1(f) and 1(g).

3. Petitioner’s motivation to combine Chishti-511 and Sachdeva is illogical and lacks a rational basis

Petitioner asserts that “a POSITA would have been motivated to use Sachdeva’s collision identification and avoidance techniques to supplement Chishti-511’s treatment-planning system.” Pet., 19. As explained below, like its element-by-element claim analysis, Petitioner mischaracterizes the disclosure of Chishti-511 by improperly conflating the two separate processes described in the

⁶ To the extent Petitioner cites to Chishti-876 as allegedly teaching that “this [claimed] feature was well known and would have been obvious in view of the combined system,” Chishti-876 is not a basis for Petitioner’s combination with respect to these limitations, as recognized by the Board. *See* Inst. Dec., 23 (stating “Chishti-876 does not appear to be part of Petitioner’s basis for disclosing the disputed limitations” 1(c)-1(g)); *supra*, §IV.C.

reference (*i.e.*, the path definition process and the aligner calculation process), which results in an inconsistent analysis that proposes conflicting ways in which a POSITA would have combined Chishti-511 and Sachdeva. EX2013, ¶109. In addition, Petitioner ignores significant differences between the systems described in Chishti-511 and Sachdeva that undermine Petitioner's motivation to combine. *Id.*

a) Petitioner advances an incoherent rationale to combine

First, Petitioner's contentions that a POSITA would have been motivated to combine Chishti-511 and Sachdeva repeatedly confuse Chishti-511's discussion of the initial path determination process (in which clinically viable path movements are identified) with Chishti-511's aligner calculation process (in which acceptable aligner shapes are determined). EX2013, ¶110. This improper treatment of separate processes as the same leads to the petition advancing inconsistent positions regarding how the POSITA would have sought to combine the teachings of Chishti-511 and Sachdeva. *Id.* This failure to present a coherent rationale to combine is enough to render Petitioner's obviousness challenge deficient. Nevertheless, even if each of Petitioner's conflicting positions are considered, none are sufficient to satisfy Petitioner's burden in establishing the obviousness of the challenged claims.

As an initial matter, Petitioner’s rationale to combine Chishti-511 and Sachdeva is deficient because it is unclear why and how a POSITA would have sought to combine the references. Specifically, at some points in the petition, Petitioner appears to propose incorporating Sachdeva’s alleged “collision identification and avoidance technique” as a means to improve Chishti-511’s path determination process (*i.e.*, step 150). EX2013, ¶111. For example, Petitioner argues that because “Chishti-511’s system generates a ‘sequence of tooth positions, so that moving from one point to the next in the sequence does not result in a collision of teeth ..., a POSITA would have been motivated to look to teachings regarding techniques for identifying and avoiding collisions.” Pet., 19. According to Petitioner, “[a] POSITA would have recognized that integrating Sachdeva’s automated collision identification, avoidance, and adjustment features into Chishti-511 would provide implementation details for the features disclosed in Chishti-511 and would help achieve the ‘clinically viable sequence of tooth positions’ sought by Chishti-511.” *Id.*, 20. Thus, at times, Petitioner appears to be taking the position that a POSITA would have looked to other references for details on how to identify Chishti-511’s “sequence of tooth positions” and would have recognized Sachdeva as providing details that would help to achieve the “clinically viable sequence of tooth positions” sought by Chishti-511 (*i.e.*, its path determination process). EX2013, ¶111.

However, at other points in the petition, Petitioner instead appears to propose incorporating Sachdeva's alleged collision identification and avoidance technique into Chishti-511's aligner calculation process (*i.e.*, step 170), particularly as part of Chishti-511's process for determining when an aligner is unacceptable. EX2013, ¶113. For instance, in addressing the claim limitations, Petitioner identifies the calculation of "new proposed aligners ... if the system determines that teeth motion is not 'orthodontically acceptable' or if 'an acceptable end position is not reached by the teeth'" as an identification of a collision. Pet., 36. Petitioner also relies on Chishti-511's step of transferring control back to the path definition process when an aligner is determined to be unacceptable. *Id.*, 37; *see also id.*, 39 (relying on same as satisfying the claimed *first modification*), 44 ("Chishti-511 discloses that '[a]fter the treatment path has been redefined' to account for the unacceptable aligners, the process is re-executed to ensure all aligners are now acceptable" (alteration original)). Moreover, in addressing reasonable expectation of success, Petitioner argues that a POSITA would have "modif[ied] Chishti-511's algorithm for calculating new aligners" to include "Sachdva's collision identification and avoidance technique." Pet., 21; *see also id.* (arguing a POSITA would understand that "Sachdeva's collision-identification process would be an option for determining the acceptability of aligners (e.g., triggering whether a new aligner should be calculated)"). Thus, in other instances,

Petitioner contends that a POSITA would have implemented Sachdeva's process as part of Chishti-511's **aligner calculation process**—*i.e.*, during step 170 of Chishti-511. EX2013, ¶113. This lack of a coherent and consistent analysis as to why and how a POSITA would have been motivated to combine Chishti-511 and Sachdeva should, on its own, render Petitioner's obviousness challenge insufficient to satisfy its burden in establishing the obviousness of the claims. *Hope Medical Enterprises, Inc. v. Fennec Pharmaceuticals, Inc.*, IPR2022-00125, Paper 38, 24-26 (Sep. 1, 2023) (petitioner's inconsistent statements regarding the combination of references "undercuts Petitioner's rationale for combining").

Moreover, even if Petitioner's conflicting proposals for the combination were considered, neither is sufficient to establish obviousness. EX2013, ¶¶112, 114-17. With regard to Petitioner's assertion that Sachdeva's technique would be used to achieve the "clinically viable sequence of tooth positions" sought by Chishti-511 (Pet., 20), such a combination would fail to satisfy the limitations of the claims for the reasons discussed above with respect to limitations 1(c) and 1(d). *Supra*, §V.A.1.b; EX2013, ¶112.

With respect to Petitioner's assertion that Sachdeva's technique would be used "for determining the acceptability of aligners (e.g., triggering whether a new aligner should be calculated)" (Pet., 21), such a rationale is unsupported because Chishti-511 does not discuss identifying collisions with respect to determining

aligner acceptability and, more importantly, Chishti-511 expressly discloses that its aligner calculation process is based on receiving as input treatment paths that have already been determined to be **collision-free**. EX2013, ¶114. Thus, as Dr. Valley explains, a POSITA would not have understood Sachdeva's process to be applicable to Chishti-511's process of calculating acceptable aligner shapes because a POSITA would have appreciated that the references are assessing different aspects of the treatment process. *Id.* As noted above, rather than identifying the paths that teeth should take, Chishti-511's aligner calculation process focuses on modeling the effects of a given aligner to evaluate whether the aligner can actually move the teeth along the desired treatment path within acceptable constraints (*e.g.*, within acceptable force levels). EX2013, ¶115; *see also supra*, §§IV.B, V.A.1.a. On the other hand, Sachdeva is focused on "simulating tooth movement," in which "a three-dimensional direct path of movement is determined" for each tooth and identifying "a conflict in movement." *See* EX1007, 3:33-36, 4:40-54, 5:3-5; EX2013, ¶116. Such an analysis would have been viewed by a POSITA as inapposite to Chishti-511's aligner calculation process because it is assessing a different aspect of the treatment process (*i.e.*, identifying whether a tooth can generally move along its direct path, as in Sachdeva, versus the ability of an aligner to achieve a particular, predetermined movement, as in Chishti-511). EX2013, ¶116.

The testimony of Petitioner’s software expert, Dr. Clark, who opines on the POSITA’s reasonable expectation of success (*see* EX1017, ¶54), does not detract from this conclusion. EX2013, ¶117. While Dr. Clark asserts that “a POSITA would have understood that Sachdeva’s process for identifying collisions may be used as part of the determination of whether a new aligner shape should be calculated,” which would have been “a mere software modification” (EX1017, ¶¶58, 61), his testimony is not credible. Dr. Clark admitted to lacking any orthodontic education or experience. EX2016, 21:2-5, 22:19-23:24. His declaration also does not purport to be based on the testimony of a POSITA with orthodontic training and experience. EX1017, ¶14; *see also* EX2016, 14:23-18:21, 25:1-26:15 (Dr. Clark claiming to have had an undisclosed conversation with Dr. Yadav but admitting to having no recollection of its substance and how it informed his opinions). In essence, Dr. Clark’s testimony amounts to the assertion that Sachdeva’s technique **could** be implemented as part of Chishti-511’s aligner shape calculation process, but there is no evidence to support that a POSITA, particularly one with orthodontic skill, would have even found it beneficial to incorporate Sachdeva’s process as part of Chishti-511’s aligner shape calculation process. EX2013, ¶117.

b) Petitioner ignores fundamental differences between Chishti-511 and Sachdeva

Petitioner also overlooks fundamental differences between the systems described in Chishti-511 and Sachdeva. EX2013, ¶118. For example, Petitioner relies on Chishti-511's process for calculating and modeling the effects of **aligners** for orthodontic treatment. *E.g.*, Pet., 21 ("Chishti-511's algorithm for calculating new aligners"), 36, 39; *see also* EX1004, 2:50-53 (stating use of the invention allows the user "to finely tune the performance of the aligners with respect to particular constraints"). As Dr. Valley notes, those skilled in the art appreciated that treatments using aligners involved the planning of the specific movements that the patient's teeth would undertake over the course of stages of treatment and that this planning occurred before the orthodontist began actual aligner treatment with the patient (*i.e.*, before the patient begins wearing the aligners). EX2013, ¶118.

However, Sachdeva is concerned with a different type of treatment system—a wire-and-brackets system (or braces)—and thus, seeks to achieve different goals. EX2013, ¶119. For example, Sachdeva explains that, when using braces, "orthodontists utilize their expertise to first determine a three-dimensional mental image of the patient's physical orthodontic structure and a three-dimensional mental of a desired physical orthodontic structure for the patient," and, "[b]ased on these mental images, the orthodontist further relies on his/her expertise to place the brackets and/or bands on the teeth and to manually bend (*i.e.*, shape) wire" to move

the teeth. EX1007, 1:22-32. Over the course of treatment, “the orthodontist makes manual adjustments to the wire and/or replaces or repositions brackets based on his or her expert opinion.” *Id.*, 1:38-40. However, Sachdeva explains that, “[b]y having the brackets as the focal point, placement of each bracket on a corresponding tooth is critical,” with even “a misplacement of a bracket by a small amount ... caus[ing] a different force system” applied to the tooth. *Id.*, 2:34-43. Another issue identified by Sachdeva is that “once the brackets are placed on the teeth, they are generally fixed for the entire treatment.” *Id.*, 2:44-46. Thus, any errors in placement of a bracket or other aspects (*e.g.*, misapplication of a bend in the wire, bonding failure, etc.) can lead to inaccuracies throughout treatment that the orthodontist must continually address through adjustments made to patient’s braces. *See id.*, 2:45-61; EX2013, ¶120. Sachdeva therefore aims to “simulat[e] tooth movement for an orthodontic treatment” by determining, “on a tooth by tooth basis, a three-dimensional direct path of movement” of a patient’s teeth. *Id.*, 3:33-48. By simulating such movement, Sachdeva teaches that this would allow the orthodontist’s use of braces to turn “from an art to a science.” *Id.*, 3:48-50, 6:5-7.

In view of these distinctions, a POSITA would not have looked to a reference like Sachdeva to “provide implementation details” on how to achieve the “clinically viable sequence of tooth positions” sought by Chishti-511. Pet., 20. As Dr. Valley explains, a POSITA would have understood that the aim of Sachdeva

was not to perform treatment planning with the goal of mapping out actual movements that teeth would undertake over a staged treatment plan, such as treatment plans used with aligner treatments. EX2013, ¶¶121-22. Instead, a POSITA would have appreciated that Sachdeva's simulation was a generic type of simulation, where start-to-finish tooth movements are projected in order to provide general guidance to an orthodontist (*e.g.*, whether to position braces on the lower arch before placement on the upper arch or whether to extract a tooth). *Id.*, ¶122.

This understanding is supported by Sachdeva's focus on treatment using braces. *Id.*, ¶123. That is, braces were known to be a reactive process in that tooth movement was planned on an iterative basis over the course of treatment where the orthodontist would make adjustments to the patient's braces during each visit to move the teeth based on how the teeth moved prior to the visit. *Id.* Thus, a POSITA would have recognized that the purpose of Sachdeva's simulation was not to plan a schedule of staged movements, as is the aim of Chishti-511, because such treatment planning was specific to treatments using aligners, not braces. *Id.* In fact, given the reactive nature of braces treatment, a POSITA would have not viewed Sachdeva as contemplating a step-by-step tooth movement because a POSITA would have readily appreciated that Sachdeva's simulation would be unable to predict how the patient's teeth would actually move over the course of braces treatment. *Id.*, ¶123 n.3. This further supports the understanding that

Sachdeva’s simulation would have been viewed by a POSITA as a general projection of tooth movements, rather than as a system that provides “implementation details” for achieving “clinically viable sequence of tooth positions.”⁷ *Id.*

Accordingly, Petitioner fails to establish a motivation to combine Chishti-511 with Sachdeva as proposed.

For the reasons above, Petitioner thus fails to meet its burden in establishing the obvious of claim 1 over Chishti-511, Chishti-876, and Sachdeva.

B. Independent Claims 8, 11, 13, and 17 Are Not Obvious over the Combination of Chishti-511, Chishti-896, and Sachdeva

Petitioner argues that the combination of Chishti-511, Chishti-876, and Sachdeva further render obvious claims 8, 11, 13, and 17. Petitioner’s arguments refer to and largely incorporate by reference its arguments with respect to independent claim 1. *See* Pet., 65 (arguing “claim limitations 8(pre)-8(g) are

⁷ This is not the first time that ClearCorrect has mischaracterized a reference in this manner. In IPR2016-00270, the Federal Circuit vacated the Board’s final written decision as lacking substantial evidence to support ClearCorrect’s application of a reference’s computer model to claims directed to individualized treatment plans. *See Align Tech., Inc. v. ClearCorrect Operating, LLC*, 745 Fed. Appx. 361, 364-66 (Fed. Cir. 2018).

taught or suggested for the reasons discussed” for claim 1), 69-71 (same for claim limitations 11(pre) through 11(f)), 71 (same for limitations 13(pre) through 13(f)), 74-75 (same for limitations 17(pre) through 17(e)). Accordingly, for the same reasons discussed above with respect to claim 1, Petitioner fails to establish that independent claims 8, 11, 13, and 17 are obvious over Chishti-511, Chishti-876, and Sachdeva. EX2013, ¶126.

C. Dependent Claims 2-7, 9, and 14-16 Are Not Obvious over the Combination of Chishti-511, Chishti-896, and Sachdeva

Claims 2-6, 8, 10, 12, 14, and 16-20 depend directly or indirectly from either claims 1, 13, or 15. These claims are not obvious over Chishti-511, Chishti-876, and Sachdeva for the same reasons identified above with respect to the independent claims. EX2013, ¶127.

VI. GROUND 2: CLAIMS 10, 12, 18, AND 19 ARE NOT OBVIOUS IN VIEW OF CHISHTI-511, CHISHTI-876, SACHDEVA, AND BECKER

Petitioner further fails to meet its burden to establish obviousness under Ground 2. As an initial matter, claim 10 depends from independent claim 8 (challenged as part of Ground 1). Moreover, Petitioner relies on and incorporates its analysis of claim 1, including limitations 1(c), 1(d), 1(f), and 1(g), as teaching the limitations recited in independent claims 12, 18, and 19. *See* Pet., 80 (claim 12), 81 (claim 18), 84-85 (claim 19). Petitioner also relies on the same flawed motivation to combine Chishti-511 and Sachdeva. Accordingly, for the same

reasons identified above with respect to Ground 1, Petitioner fails to establish the obviousness of claims 10, 12, 18, and 19 over Chishti-511, Chishti-876, Sachdeva, and Becker. EX2013, ¶¶128-29.

Additional reasons also exist as to why Petitioner fails to satisfy its burden in establishing the obviousness of the challenged claims under Ground 1. For instance, Petitioner relies on the same flawed understanding of Chishti-511 (*i.e.*, improperly conflating its path definition process with its aligner calculation process) to argue that a POSITA would have been motivated to combine Chishti-511 with Becker. *See* Pet., 25 (“Like Sachdeva’s technique, a POSITA would have been motivated to integrate Becker’s round-tripping treatment technique as an option in Chishti-511’s algorithm for calculating new aligners, such as when it is determined that the aligner is unacceptable (e.g., the treatment plan results in a collision).”). Thus, Petitioner fails to show that a POSITA would have been motivated to modify Chishti-511 with Becker as proposed for the same reasons explained above with respect to Petitioner’s asserted motivation to combine Chishti-511 and Sachdeva.

Moreover, despite granting institution, the Board has already determined Ground 2 is deficient. The institution decision notes that the petition failed to present sufficient evidence and explanation to establish that a POSITA “would have had an apparent reason to combine Becker’s round-tripping technique with

aligner treatment systems like those taught in the Chishti patents, particularly in view of Chishti-876's disparagement of round-tripping generally." Inst. Dec., 29. More specifically, the Board recognized that "Chishti-876 disparages 'moving a tooth along a distance greater than absolutely necessary to straighten the teeth,'" which is "a broad statement that appears to encompass the more specific round-tripping movement taught in Becker." *Id.*, 28. The Board also found that the petition failed to "demonstrate a reasonable likelihood that a skilled artisan would have combined Becker's movement pattern with the Chishti systems and Sachdeva" and lacked "persuasive evidence that using aligners to effect Becker's tooth transposition 'would be appropriate or even possible.'" *Id.*, 28-29.

Dr. Valley confirms that a POSITA would not have been motivated to combine the references as proposed in view of Chishti-876's teaching away of "moving a tooth along a distance greater than absolutely necessary to straighten the teeth" and in view of Becker's treatment of a "rare" orthodontic case using a complex appliance system involving mechanically intricate equipment. EX1005, 14:46-51; EX2013, ¶¶130-31. The incurable petition deficiencies recognized at institution remain the same, and the Board should likewise reject Ground 2 in the final written decision.

Lastly, as noted in Patent Owner's preliminary response, the petition is defective for failing to address Chishti-876's teaching away from the modification

the petition proposes in its combination. *See* POR, 18-22. Where there is a known prior art teaching away, this teaching must be squarely addressed in the petition materials. It is black letter law that the full “scope and content of the prior art” must be determined when assessing obviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1969). This includes prior art teachings disparaging a modification that would lead to the claimed invention. *E.g.*, *United States v. Adams*, 383 U.S. 39, 52 (1966) (recognizing teaching away when “known disadvantages in old devices which would naturally discourage the search for new inventions”). There is no question that Petitioner was aware of the Board’s findings regarding Chishti-876’s teachings prior to the filing of its petition. Thus, Petitioner’s failure to address this evidence cannot be cured during trial—it must have been addressed in the petition. The Board’s findings on institution only serve to confirm that the petition is incurably deficient.

Accordingly, for the reasons above, Petitioner fails to satisfy its burden with respect to Ground 2.

VII. CONCLUSION

Accordingly, for at least the reasons set forth above, the petition fails to meet its burden of establishing the unpatentability of claims 1-19 of the ’456 patent. Patent Owner respectfully submits that the challenged claims should be found to be not unpatentable over the grounds raised in the petition.

Respectfully submitted,

Date: February 03, 2026

/ Michael T. Rosato /

Michael T. Rosato, Lead Counsel

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VIII. APPENDIX

EXHIBIT NO.	DESCRIPTION
2001	Claim Construction Order, <i>Align Technology Inc. v. ClearCorrect Operating LLC</i> , et al., No. 24-cv-00187-ADA-DTG (W.D. Tex. Jun. 5, 2025)
2002	Scheduling Order, <i>Align Technology Inc. v. ClearCorrect Operating LLC</i> , et al., No. 24-cv-00187-ADA-DTG (W.D. Tex. Aug. 5, 2024)
2003	Fourth Scheduling Order, <i>Align Technology Inc. v. ClearCorrect Operating LLC</i> , et al., No. 24-cv-00187-ADA-DTG (W.D. Tex. Jun. 12, 2025)
2004	DocketNavigator Median Time-to-Trial Statistics for Judge Alan D. Albright and for W.D. Tex. Overall, July 1, 2020 – July 1, 2025
2005	Judge Albright Patent FAQ, https://www.txwd.uscourts.gov/for-attorneys/judge-albright-courtroom-faq/ (accessed July 3, 2025)
2006	Joint Request to Amend the Claim Schedule, <i>Align Technology Inc. v. ClearCorrect Operating LLC</i> , et al., No. 24-cv-00187-ADA-DTG (W.D. Tex. Jun. 6, 2025) (ECF No. 187)
2007	Preliminary Claim Constructions, <i>Align Technology Inc. v. ClearCorrect Operating LLC</i> , et al., No. 24-cv-00187-ADA-DTG (W.D. Tex. Jan. 21, 2025)
2008	Complaint for Damages and Injunctive Relief, <i>Align Technology, Inc. v. ClearCorrect Operating, LLC</i> , Case No. 6:24-cv-00187 (W.D. Tex. Apr. 11, 2024) (ECF No. 1)
2009	ClearCorrect’s Preliminary Invalidity Contentions, <i>Align Technology, Inc. v. ClearCorrect Operating LLC</i> , Case No. 6:24-CV-00187 (W.D. Tex. Sept. 26, 2024)

2010	U.S. Patent No. 6,350,120 to Sachdeva et al.
2011	ClearCorrect Prior Art Narrowing Disclosure, <i>Align Technology, Inc. v. ClearCorrect Operating, LLC</i> , Civil Action No. 6:24-cv-00187-ADA-DTG
2012	Defendants' Answer (Public Version), <i>Align Technology, Inc. v. ClearCorrect Operating, LLC</i> , Case No. 6-24-cv-00187 (W.D. Tex.)
2013	Declaration of Maureen Valley, D.M.D., M.P.H., M.S.
2014	<i>Curriculum vitae</i> of Maureen Valley, D.M.D., M.P.H., M.S.
2015	Transcript of the Deposition of Dr. Sumit Yadav, held on January 8, 2026
2016	Transcript of the Deposition of Dr. Paul Clark, held on January 22, 2026
2017	Copy of EX1007, as filed in <i>ClearCorrect Operating, LLC v. Align Technology, Inc.</i> , IPR2016-00270

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 11970 words.

Respectfully submitted,

Date: February 03, 2026

/ Michael T. Rosato /
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CERTIFICATE OF SERVICE

I certify that the foregoing Patent Owner's Response Pursuant to 37 C.F.R. §42.120 and accompanying Exhibits 2013-2017 were served on this 3rd day of February, 2026, on the Petitioner at the following electronic service addresses:

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