Trials@uspto.gov
571-272-7822

Paper No. 15
Entered: October 23, 2025

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CLEARCORRECT OPERATING, LLC,
Petitioner,

v.

ALIGN TECHNOLOGY INC.,
Patent Owner.

IPR2025-00814
Patent 10,456,217 B2

Before KEVIN F. TURNER, KRISTINA M. KALAN, and CYNTHIA M. HARDMAN, *Administrative Patent Judges*.

TURNER, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Petitioner ClearCorrect Operating, LLC requests *inter partes* review of claims 1–24 of U.S. Patent No. 10,456,217 B2 ("the '217 Patent," Ex. 1001). Paper 1 ("Pet.") 2. Patent Owner Align Technology, Inc. filed a Preliminary Response. Paper 11 ("Prelim. Resp.").

We note that Patent Owner filed a Brief in Support of Discretionary Denial (Paper 8) with the Director, to which Petitioner filed an Opposition (Paper 9), and to which Patent Owner responded with a Reply (Paper 12), but the Director referred the Petition to the Board (Paper 14), denying Patent Owner's request for discretionary denial.

We have authority under 35 U.S.C. § 314(a), which provides that an *inter partes* review may not be instituted "unless . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." After considering the briefing and cited evidence of record, we deny *inter partes* review because we find that Petitioner does not establish a reasonable likelihood that it will prevail with respect to at least one of the claims challenged in the petition.

A. Real Parties in Interest

Petitioner identifies itself (ClearCorrect Operating, LLC) and ClearCorrect Holdings, Inc., Straumann USA, LLC, and Institut Straumann AG as the real parties in interest. Pet. 77. Patent Owner identifies itself (Align Technology, Inc.) as the real party in interest. Paper 3 (Patent Owner Mandatory Notices), 1.

B. Related Matters

The parties identify as related matters the following litigation involving the '217 Patent: *Align Technology, Inc. v. ClearCorrect Operating, LLC*, Case No. 6:24-cv-00187-ADA-DTG (W.D. Tex.). Pet. 77; Paper 3, 1. Patent Owner also identifies the following *inter partes* reviews: IPR2025-00815 (U.S. Patent No. 10,524,879); IPR2025-00816 (U.S. Patent No. 11,369,456); IPR2025-00817 (U.S. Patent No. 10,791,936); IPR2025-00818 (U.S. Patent No. 10,973,613); IPR2025-00819 (U.S. Patent No. 11,154,384); IPR2025-00820 (U.S. Patent No. 11,648,090); and IPR2025-00821 (U.S. Patent No. 11,648,091). Paper 3, 1–2.

The record also reflects Petitioner's previous challenge to U.S. Patent No. 8,038,444 ("the '444 patent"), which is the great-grandparent of the '217 Patent, in IPR2017-01829 ("the '444 IPR"). *See, e.g.*, Pet. 6; Prelim. Resp. 1–2; Ex. 1001, code (63). The Board did not institute the '444 IPR. *See generally* Ex. 1008.

C. The '217 Patent (Ex. 1001)

The '217 Patent, titled "Automated Treatment Staging For Teeth," relates to "provid[ing] apparatus, systems, and methods for automated staging of teeth, from an initial position to a final, corrected position." Ex. 1001, code (54), 2:10–12. "Depending upon the particular needs of the patient, the patient's teeth are scheduled to move according to various movement patterns, routes, rates, and/or distances," using techniques including "tooth staggering, round-tripping, and/or slowing." *Id.* at 2:12–22.

A computing device generates a representation of the patient's teeth in an initial state and in the desired final position, and "calculates the planned

stages in between the current and desired final position[s]." Ex. 1001, 5:45–55. We reproduce Figure 2B below.

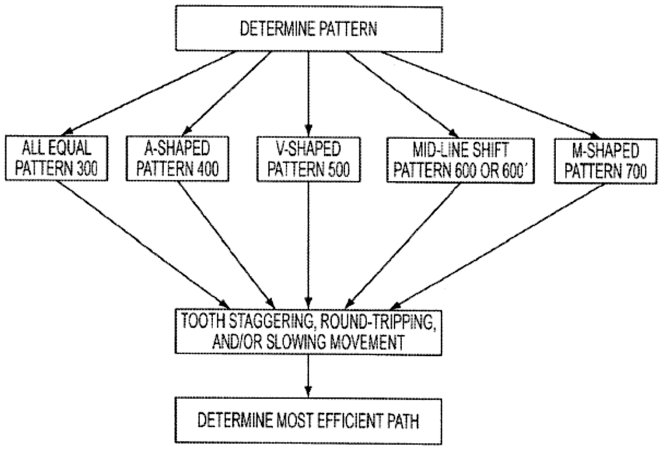


Figure 2B is a flow diagram of patterns and options for optimizing the movement of a patient's teeth during treatment. *Id.* at 2:42–45. The computer program first determines what type of movement pattern is needed, such as an "'all-equal' pattern," or an "'A-shaped' pattern." *Id.* at 5:55–6:13. The computer program then determines "if the pattern should be modified to accommodate the teeth movement of the current patient to avoid collision," e.g., by staggering, round-tripping, and/or slowing the movement of one or more teeth. *Id.* at 6:41–57, 12:63–13:21.

A set of aligners to move the teeth along the route in various stages is manufactured. *Id.* at 5:36–37, claim 4.

D. The Challenged Claims

Petitioner challenges all claims (1–24) of the '217 Patent. Claims 1 and 11 are independent. Claim 1, reproduced below with annotations,[1] is representative of the challenged claims:

> 1. [1(pre)] A method comprising:
>
> [1(a)] selecting a movement pattern from a plurality of movement patterns for moving dental objects from an initial arrangement toward a final arrangement, the dental objects being based on output of a scanning device, the movement pattern defining a schedule of movement of the dental objects during treatment stages as each of the dental objects moves from a respective initial position toward a respective final position;
>
> [1(b)] calculating, by a computer processor, a respective treatment path for each of the dental objects between its respective initial and final positions;
>
> [1(c)] identifying, by a computer processor, a collision between a first of the dental objects and a second of the dental objects based at least on one of the respective treatment paths; and
>
> [1(d)] performing, by a computer processor, a first modification of the schedule of movement in response to the identifying, the first modification comprising:
>
> [1(e)] round-tripping the first dental object.

Ex. 1001, 16:6–25.

[1] For ease of reference, we use the same bracketed notations Petitioner uses in the Petition. *See, e.g.*, Pet. x–xv (claims listing).

E. Asserted Ground of Unpatentability

Petitioner asserts the following ground of unpatentability:

Claim(s) Challenged	35 U.S.C. §[2]	Reference(s)/Basis
1–20	103(a)	Chishti-511,[3] Chishti-876,[4] Sachdeva,[5] Becker[6]

Pet. 3. Petitioner supports its arguments with declarations from Dr. Sumit Yadav (Ex. 1003) and Dr. Paul C. Clark (Ex. 1017), among other evidence.

II. ANALYSIS

A. Principles of Law

In an *inter partes* review, "the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable." *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify "with particularity . . . the evidence that supports the grounds for the

[2] The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) ("AIA") included revisions to 35 U.S.C. § 103 that became effective on March 16, 2013. Petitioner applies a priority date of August 30, 2006. *See* Pet. 2. Accordingly, we apply the pre-AIA version of § 103; however, our decision would be no different under the AIA version of the statute.

[3] U.S. Patent No. 6,471,511 to Chishti et al., issued October 29, 2002 (Ex. 1004, "Chishti-511").

[4] U.S. Patent No. 6,729,876 to Chishti et al., issued May 4, 2004 (Ex. 1005, "Chishti-876").

[5] U.S. Patent No. 6,250,918 to Sachdeva et al., issued June 26, 2001 (Ex. 1007, "Sachdeva").

[6] Adrian Becker, *The Orthodontic Treatment of Impacted Teeth* (Martin Dunitz Ltd. 1998) (Ex. 1006, "Becker").

challenge to each claim")). Petitioner ultimately bears the burden of persuasion to prove unpatentability of each challenged claim by a preponderance of the evidence. 35 U.S.C. § 316(e). This burden never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

Under pre-AIA 35 U.S.C. § 103(a), a claim is unpatentable as obvious if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. 35 U.S.C. § 103(a); *see also KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved based on underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) any objective indicia of nonobviousness.[7] *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). An obviousness determination requires finding a reason to combine accompanied by a reasonable expectation of achieving what is claimed in the challenged patent. *See Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367 (Fed. Cir. 2016). "[A]ny need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." *KSR*, 550 U.S. at 419–20.

[7] At this stage, Patent Owner does not assert any objective indicia of nonobviousness. *See generally* Prelim. Resp.

B. Level of Ordinary Skill in the Art

We consider the grounds of unpatentability in view of the understanding of a person of ordinary skill in the art at the time the invention was made. *See Graham*, 383 U.S. at 17–18. Petitioner proposes that a person of ordinary skill in the art (sometimes referred to herein as a "POSITA")

> as of the August 30, 2006 claimed priority date would have been part of an interdisciplinary team. This team would have included a member 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. The team may have also included members with a degree in a technical area related to software, graphics, computers, or a related discipline. This technical team member would have had 1–3 years of software development experience. For all team members, more education could substitute for experience and vice versa.

Pet. 7–8 (citing Ex. 1003 ¶¶ 23–24; Ex. 1017 ¶¶ 23–25; Ex. 1029; Ex. 1030).

At this stage, Patent Owner does not dispute Petitioner's proposal or offer an alternative proposal. *See generally* Prelim. Resp.

Because Petitioner's proposed level of ordinary skill in the art appears to be consistent with the cited prior art and is undisputed on this record, we adopt it for purposes of this Decision. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (indicating that the prior art itself may reflect an appropriate skill level).

C. Claim Construction

The Board interprets a claim using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. § 282(b). 37 C.F.R. § 42.100(b). Under this standard,

we construe a claim "in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent." *Id.* A patentee may act as its own lexicographer by clearly setting forth a definition of a claim term. *See, e.g.*, *Thorner v. Sony Comput. Entm't Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012).

The parties indicate that in the co-pending litigation in the District Court for the Western District of Texas (*see supra* Section I.B), they jointly adopted the definition of "round-tripping" set forth in the '217 Patent Specification. Pet. 9; Prelim. Resp. 7–8; Ex. 1013, 8. The '217 Patent Specification defines "round-tripping" as

> moving a first tooth out of the path of a second tooth, and once the second tooth has moved sufficiently, moving the first tooth back to its previous position before proceeding to a desired final position of that first tooth.

See Ex. 1001, 13:7–11. We adopt this agreed-upon construction for purposes of this Decision.

Neither party indicates that any other claim term requires express construction. Only claim terms in controversy need be construed. *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) ("[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy."). For purposes of this Decision, we determine that no other claim term requires construction.

D. Overview of the Prior Art

1. Chishti-511 (Ex. 1004)

Chishti-511 is titled "Defining Tooth-Moving Appliances Computationally." Ex. 1004, code (54). It relates to "methods and

apparatus" for "repositioning teeth from an initial tooth arrangement to a final tooth arrangement." *Id.* at 1:33–36. In particular, a patient's teeth are repositioned "by making a series of incremental position adjustments" using, for example, "a series of appliances formed as polymeric shells having the tooth-receiving cavities." *Id.* at 1:39–47. The appliances are used together with a computational orthodontic system that provides "a path definition module that calculates the paths taken by teeth as they are repositioned during treatment." *Id.* at 1:59–67. We reproduce Figure 1 below.

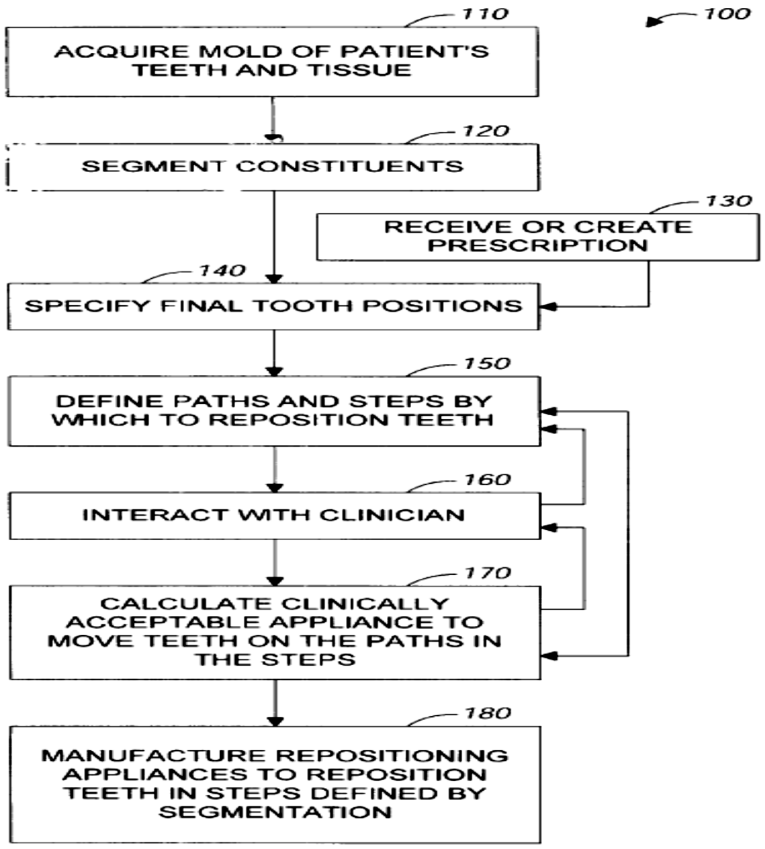


Figure 1 "is a flowchart of a process of specifying a course of treatment including a subprocess for calculating aligner shapes." Ex. 1004, 2:65–67.

At step 110, a mold or scan of the patient's teeth and tissue is acquired (e.g., by taking casts of the patient's teeth and gums and x-ray imaging) and a digital data set is derived that represents the initial pretreatment arrangement of the patient's teeth and tissue. *Id.* at 3:40–50. At step 120, data structures that digitally represent individual tooth crowns are produced and digital models of entire teeth are also produced (including hidden surfaces and root structures). *Id.* at 3:51–58. At step 130, the desired final position of the teeth (intended end result of treatment) is received from a clinician. *Id.* at 3:59–64. At step 140, using the desired final positions (intended) and digital representations (current), the final position and surface geometry of each tooth is specified to form a complete model of the teeth as desired at the end of treatment (e.g., orthodontically correct repositioning). *Id.* at 3:64–4:6. At step 150, a subprocess defining segmented paths calculates the paths based on threshold limits of linear and rotational translation (e.g., with default values based on the nature of the appliance to be used) and tailored limit values calculated from patient-specific data. *Id.* at 4:23–35.

At step 160, after the segmented paths have been defined, a client process allows a clinician to display an animation of the positions and paths, to reset the final positions of the teeth, and to specify constraints of the segmented paths (and step 150 is re-performed to implement changes to the segmented paths). *Id.* at 4:39–48. At step 170, the 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. *Id.* at 4:51–56.

At step 180, appliances defined by the process are manufactured. *Id.* at 5:1–6.

Each appliance configuration represents a step along the treatment path. *Id.* at 4:56–57. Each tooth path has a beginning and final position. *Id.* at 4:7–9. The tooth path segments are calculated so that each tooth's motion within a segment stays within threshold limits of linear and rotational translation. *Id.* at 4:15–18. Chishti-511 teaches:

> The 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. (Round-tripping is any motion of a tooth in any direction other than directly toward the desired final position. Round-tripping is sometimes necessary to allow teeth to move past each other.)

Id. at 4:9–16.

2. Chishti-876 (Ex. 1005)

Chishti-876 is titled "Tooth Path Treatment Plan." Ex. 1005, code (54). It teaches "[s]ystems and methods . . . to prepare a malocclusion treatment plan by selecting a tooth treatment pattern from a library of predetermined tooth treatment patterns." *Id.* at code (57). The system "draw[s] upon a database of preferred treatments for exemplary tooth arrangements," which are based on observations learned from prior successful treatments. *Id.* at 14:63–15:1.

"[D]etermining a tooth path includes finding a collision free shortest path between an initial position and a final position for one or more teeth." *Id.* at 2:28–30. A path-scheduling algorithm can "create several alternative paths and present each path graphically to the user." *Id.* at 15:1–3. The "path scheduling algorithm . . . determines the rate at which each

component, i.e., each tooth, moves along the path from the initial position to the final position." *Id.* at 14:43–46. Chishti-876 teaches that "[t]he path scheduling algorithm determines the treatment path while avoiding 'round-tripping,' i.e., while avoiding moving a tooth along a distance greater than absolutely necessary to straighten the teeth. Such motion is highly undesirable, and has potential negative effects on the patient." *Id.* at 14:43–51.

Chishti-876's "method can include generating an appliance for each treatment stage," such as a set of aligners. *Id.* at 2:35–38, 11:34–37.

3. Sachdeva (Ex. 1007)

Sachdeva is titled "Method and Apparatus for Simulating Tooth Movement for an Orthodontic Patient." Ex. 1007, code (54). Sachdeva teaches a method for simulating tooth movement for an orthodontic patient. *Id.* at 3:28–30, 4:39–40. On a tooth-by-tooth basis, a three-dimensional direct path of movement is determined from an actual tooth position in relation to a desired tooth position. *Id.* at 4:50–54. A determination is made whether a conflict in movement arises between teeth during the simulation (e.g., movement of one tooth interferes with the direct path movement of another tooth to its desired position). *Id.* at 5:3–8. If a conflict arises, it is resolved by selecting a priority tooth based on the relationship between the teeth and the conflict. *Id.* at 5:9–15. Movement of the priority tooth is determined to resolve the conflict, and the simulation is adjusted based on the movement of the priority tooth. *Id.* at 5:27–32.

4. Becker (Ex. 1006)

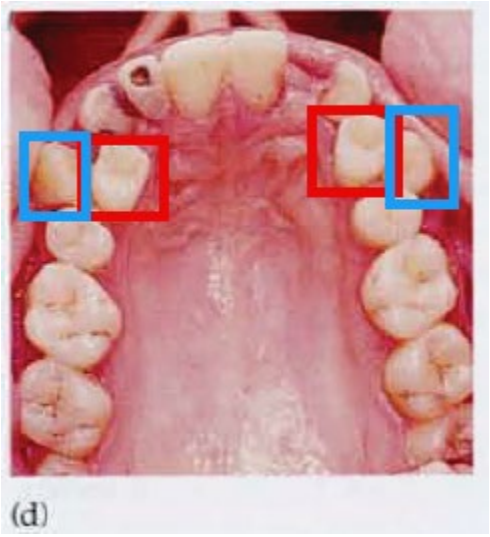
Becker is an excerpt from a book titled "The Orthodontic Treatment of Impacted Teeth." Ex. 1006, 2. The excerpt is part of a chapter titled

"Impacted teeth in the adult." *See id.* at 4 (table of contents), 5 (chapter heading). Under a subheading titled "Temporary Prosthetic Replacement and Tooth Transposition," Becker teaches:

> Rarely, one or more of the impacted teeth is also transposed. For the most part, it is preferable to align the teeth in their transposed positions, rather than to try to retranspose them to their ideal positions, for reasons already discussed in Chapter 6.[8] Nevertheless, there are situations in which this may be preferred line of treatment.

Id. at 5.

Using a series of photographs, Becker illustrates a process for moving teeth to correct transposition of a patient's maxillary canine and first premolar. *Id.* at 6–8. We reproduce below our annotated version of Becker's Figure 8.6(d).



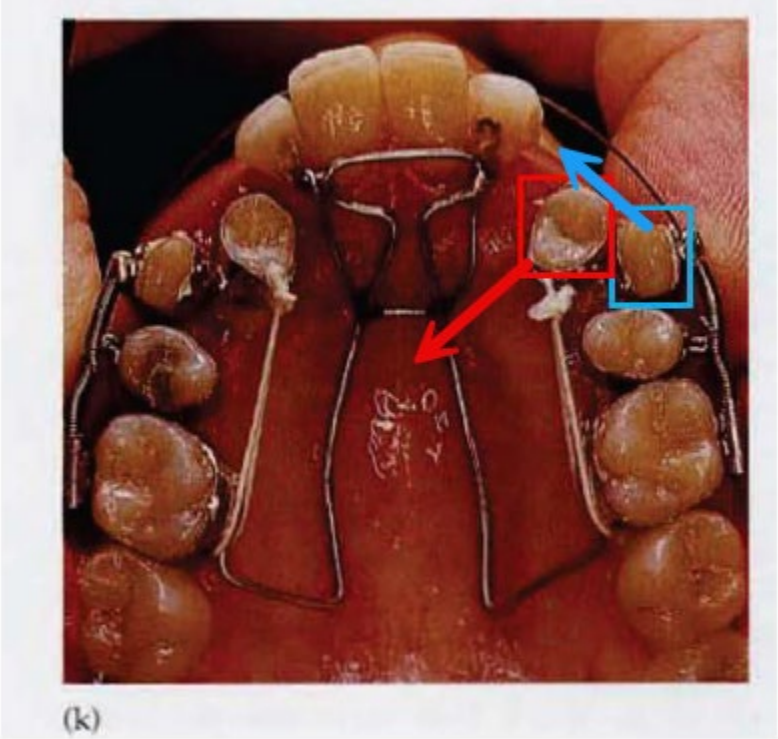
Becker's Figure 8.6(d) is a photograph showing an occlusal view of a patient's maxillary arch.[9] *Id.* at 6. As highlighted by our annotations, on

[8] Becker Chapter 6 is not of record.

[9] In Figure 8.6(d), the patient's "deciduous canines and right lateral incisor are still present." Becker 6. At the start of treatment, these deciduous (or

both sides of the mouth, the patient's maxillary canines (blue boxes) and first premolars (red boxes) are transposed. Although Becker's process carries out transposition bilaterally, for clarity, below we walk through the process on only one side of the mouth.

We reproduce below Petitioner's annotated version of Becker's Figure 8.6(k). *See* Pet. 47.

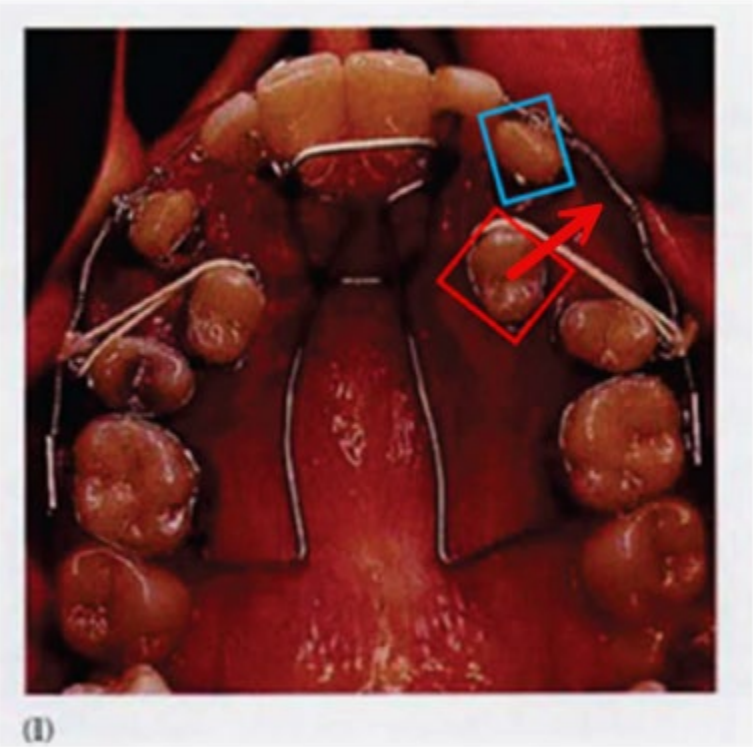


Becker's Figure 8.6(k) is a photograph showing the patient's maxillary arch during treatment. *Id.* at 7. A labial archwire is spanned from molar to molar, and the archwire is passed through brackets on the lateral incisor pontics (i.e., the artificial teeth flanking the front teeth). *Id.* at 5. Loops, cross-pieces, and elastic thread are disposed on the palatal arch. *Id.*

"baby") teeth were extracted. *Id.* As discussed below, a palatal arch was added and used to support lateral incisor pontics (i.e., artificial incisors). *See id.*

Figure 8.6(k) includes Petitioner's annotations (red and blue boxes) and our annotations (red and blue arrows) for identifying teeth and their movement. *See* Pet. 46. Figure 8.6(k) depicts the maxillary canine (blue box) transposed with the first premolar (red box). The palatal arch is used to move the premolar through the varying use of elastic thread. Ex. 1006, 6. The hardware directs the premolar (red box) inward (as indicated by the red arrow), so that the canine (blue box) can move toward the incisor (as indicated by the blue arrow). Pet. 45.

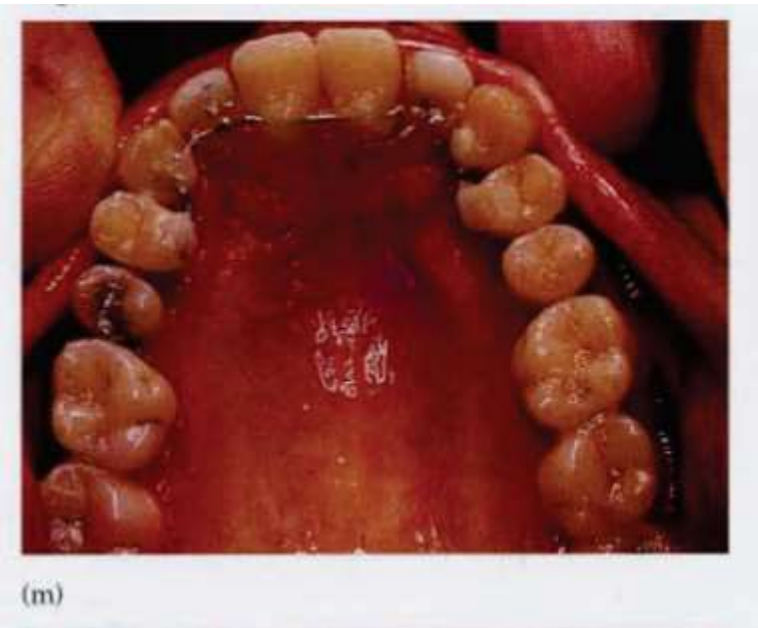
We reproduce below an annotated version of Becker's Figure 8.6(l).



Becker's Figure 8.6(l) is a photograph of a patient's teeth mid-transposition. Ex. 1006, 7. The premolar (red box) was moved inwardly and thereby out of the path of the canine (blue box), and the canine was moved into its desired position next to the incisor pontic. *Id.* at 5–6. As indicated by the red arrow,

the premolar will "be moved in the opposite mesio-distal direction and back in the line of the arch." *Id.*

We reproduce below Becker's Figure 8.6(m).



Becker's Figure 8.6(m) is a photograph of the completed transposition. *Id.* at 8.

E. Alleged Obviousness over Chishti-511, Chishti-876, Sachdeva, and Becker

Petitioner asserts that claims 1–24 would have been unpatentable as obvious over Chishti-511, Chishti-876, Sachdeva, and Becker. Pet. 19–76. Patent Owner focuses its rebuttal on the "round-tripping" claim limitation, which is found in each independent claim (limitations [1(e)] and [11(e)]). *See* Pet. x–xv (claims listing). We likewise focus our analysis on this disputed limitation.

1. Petitioner's Obviousness Argument

Petitioner argues that Chishti-511 "discloses a computerized system that receives digital representations of a patient's teeth and generates a

treatment plan for clear aligners," while "[t]he other cited references disclose well-known features that would have been obvious components of an automated software treatment-planning system." Pet. 1. In particular, Petitioner argues that "Chishti-876 discloses a database of established treatment patterns for creating well-known treatment plans," "Sachdeva discloses an automated, computerized system that identifies when a treatment plan may have a collision between teeth and automatically modifies the plan to avoid collisions," and Becker "discloses the particular collision-avoidance technique that was the basis for allowance of the '217 Patent: round-tripping." *Id*. at 1–2.

Focusing on round-tripping, Petitioner argues that Becker demonstrates round-tripping as claimed because it depicts moving a first tooth inward toward the patient's palate to allow a second tooth to pass by, then moving the first tooth back to its original position and then, to its desired final position. *See* Pet. 44–49, 74–75. Petitioner argues that a person of ordinary skill in the art would have combined this "collision-avoidance technique" in Becker with Chishti-511's system because "Chishti-511 already discusses the need for collision-free treatment paths (Ex[.] 1004, 4:15–22), so a skilled artisan would have been motivated to look to techniques for avoiding collisions [during treatment]." *Id.* at 23–24 (citing Ex. 1003 ¶ 80).

Petitioner acknowledges that "round-tripping can have disadvantages," but argues that "a POSITA would have recognized that for some patients, there may be no other option other than to round-trip one or more teeth, particularly if the patient or clinician wishes to avoid extracting one or more teeth." *Id.* at 26 (citing Ex. 1003 ¶ 83). Thus, Petitioner argues,

"a POSITA would have been motivated to include round-tripping as one feature in a system with robust software for generating treatment plans for a broad range of patients with different needs, and this would have been obvious, even if those features are only used in rare cases or as a last resort for patients that might otherwise not be able to be treated." *Id.* at 27 (Ex. 1003 ¶ 83).

Petitioner asserts that adding "Becker's technique to round-trip one or more teeth" to Chishti-511's system "would have involved modifying Chishti-511's software algorithm for calculating new aligners and path redefinition process . . . , which would have yielded predictable results and had a reasonable expectation of success." *Id.* at 28.

2. Patent Owner's Arguments

Patent Owner argues that Petitioner's obviousness argument fails for at least three reasons. Prelim. Resp. 8–9. First, Patent Owner argues that "[t]he petition is incurably defective for failing to address Chishti-876's teaching away from the modification the petition proposes in its combination." *Id.* at 10. Specifically, Patent Owner explains that in the '444 IPR, "Petitioner advanced a combination of the same Chishti-511 and Chishti-876 references," but the Board denied institution, in part based on a finding that Chishti-876 explicitly teaches away from round-tripping. *Id.* at 1–2, 8–9; *see also* Ex. 1008, 11–12. Patent Owner asserts that "Petitioner never once mentions the Board's finding regarding Chishti-876, nor does it dispute that Chishti-876 teaches away from its proposed modification," which Patent Owner contends is fatal to the Petition. Prelim. Resp. 14; *see also id.* at 10 ("Where there is a known prior art

teaching away, this teaching must be squarely addressed in the petition materials.").

Second, Patent Owner argues that "Chishti-876's disparagement of round-tripping undermines the obviousness challenge" because "a teaching away can entirely preclude a finding of obviousness." Prelim. Resp. 14–15 (title case and emphasis omitted) (citing *In re Mouttet*, 686 F.3d 1322, 1333 (Fed. Cir. 2012)).

Third, Patent Owner argues that "Petitioner fails to show a POSITA would have been motivated to modify the Chishti Patents to incorporate Becker." Prelim. Resp. 21 (title case and emphasis omitted). According to Patent Owner, "Becker is a different orthodontic treatment modality" using "braces and numerous brackets, wires, and rubber bands, with the wire-and-bracket systems being attached directly and permanently to the teeth." *Id.* at 21–22. The Chishti patents, in contrast, use orthodontic aligners and "pre-staging a series of tooth positions from which a sequence of appliances can be manufactured." *Id.* at 22. Patent Owner asserts that "Petitioner does not seriously suggest that the type of treatment taught by Becker (a complex transposition of teeth) would have been viewed as achievable with aligner treatment prior to the '217 patent's priority date." *Id.* In view of the differences between Chishti and Becker, and against the backdrop of the purported teaching away, Patent Owner contends that Petitioner's unpatentability theory rests on "blatant hindsight reasoning." *Id.* at 23.

3. Analysis

In view of the arguments and cited evidence, we find on this record that Petitioner has not demonstrated a reasonable likelihood of showing that a person of ordinary skill in the art would have been motivated to combine

Becker's round-tripping with the teachings of the Chishti patents and Sachdeva.

To begin, we assess whether the prior art teaches away from round-tripping. As discussed above, round-tripping as claimed requires a specific sequence, namely, moving a first tooth out of the path of a second tooth, and once the second tooth has moved sufficiently, moving the first tooth back to its previous position before proceeding to a desired final position of that first tooth. *See supra* Section II.C; Ex. 1001, 13:7–11.

Chishti-511 teaches a broader type of movement, defining "round-tripping" as "any motion of a tooth in any direction other than directly toward the desired final position." Ex. 1004, 4:12–13. Chishti-511 teaches minimizing round-tripping ("teeth are moved in the quickest fashion with the least amount of round-tripping"), but acknowledges that "[r]ound-tripping is sometimes necessary to allow teeth to move past each other." *Id.* at 4:9–15.

In an attempt to counter Patent Owner's teaching away arguments, Petitioner relies heavily on Chishti-511's statement that "[r]ound[-]tripping is sometimes necessary." *See* Pet. 29–30; *see also* Ex. 1003 ¶ 83 (Dr. Yadav relying on Chishti-511). This reliance is unavailing, because as noted above, Chishti-511 defines "round-tripping" more broadly than is claimed here. Indeed, in the '444 IPR, the Board stated that "the 'round tripping' described in Chishti '511 is something different than the 'round tripping' required by the '444 patent."[10] Ex. 1008, 16. Despite being aware of this prior finding

[10] In the '444 IPR, the Board employed the same construction of "round-tripping" that we use here. *Compare* Ex. 1008, 6, *with* Section II.C *supra*.

(*see* Pet. 6), Petitioner here fails to address the difference between Chishti-511's round-tripping and the claimed round-tripping. That is, Petitioner places great weight on Chishti-511's statement that "round-tripping is sometimes necessary," but has not established that Chishti-511 contemplates round-tripping as claimed, as opposed to some other, different movement pattern encompassed by Chishti-511's broader statement about round-tripping.

While Chishti-511 teaches that moving a tooth in a direction other than towards its final position should be minimized, the later-filed Chishti-876 "expound[s] that round-tripping must be avoided in aligner treatment, as it risks harming patients." Prelim. Resp. 18. Specifically, Chishti-876 teaches that its "path scheduling algorithm determines the treatment path while ***avoiding 'round-tripping,'*** i.e., while avoiding moving a tooth along a distance greater than absolutely necessary to straighten the teeth. Such motion is ***highly undesirable***, and has ***potential negative effects*** on the patient." Ex. 1005, 14:43–51 (emphases added). Although Chishti-876's version of "round-tripping" is again broader than the claimed round-tripping, we nevertheless find that Chishti-876's teaching of "avoiding moving a tooth along a distance greater than absolutely necessary to straighten the teeth," which appears to encompass the claimed round-tripping, teaches away from the claimed round-tripping.

The Petition nowhere expressly addresses this teaching in Chishti-876. In the '444 IPR, the Board previously recognized that this teaching in Chishti-876 constitutes a teaching away from round-tripping, and Petitioner nowhere expressly addresses this prior Board finding. *See* Ex. 1008, 11–12. Patent Owner argues that these omissions are fatal to institution. *See* Prelim.

Resp. 10. Although addressing a teaching away (and a prior Board finding) may be prudent and highly desirable, Patent Owner does not direct us to a bright-line rule requiring that "a known prior art teaching away . . . must be squarely addressed in the petition materials." *Id*.

Nor do we agree with Patent Owner that "Chishti-876's disparagement of round-tripping," standing alone, "undermines the obviousness challenge." Prelim. Resp. 10, 14 (title case and emphasis omitted). "[T]here is no rule that a single reference that teaches away will mandate a finding of nonobviousness." *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006). Rather, we must consider the prior art "as a whole for what it teaches." *Id.* at 1166 (emphasis omitted). Although it is somewhat surprising—particularly in view of the Board's prior findings in the '444 IPR—that Petitioner did not directly address Chishti-876's teaching away, the Petition does in fact address the prior art as a whole, including statements in the prior art that "round-tripping should be avoided." *See, e.g.*, Pet. 17–18, 24–27, 28–29.

To further blunt Patent Owner's teaching away arguments, Petitioner seeks to characterize round-tripping as "a last resort for patients that might otherwise not be able to be treated." Pet. 27 (citing Ex. 1003 ¶ 83); *see also* Pet. *passim*; Ex. 1003 ¶¶ 41, 68, 83, 84. We find that this characterization is not well-supported. Petitioner bases this argument on language in the '217 Patent that calls round-tripping a "last resort." *See, e.g.*, Pet. 5. It is true that the '217 Patent teaches, in one "exemplary embodiment," that the "computer program first attempts staggering of the teeth movement, followed by slowing-down/interim key frames if the staggering does not avoid collisions, and then followed by ***round-tripping as a last resort***." Ex. 1001, 13:15–19

(emphasis added). But this is merely one embodiment, and "in the same paragraph, the '217 Patent teaches that 'staggering, slowing down and/or round-tripping can be suitably applied alone or in combination, and **in any order**.'" Prelim. Resp. 6 (quoting Ex. 1001, 13:11–13). Thus, we agree with Patent Owner that the '217 [P]atent places round-tripping "on the same footing as the other complex tooth movements that can be incorporated into its treatment planning software." *Id.*; *see also, e.g.*, Ex. 1001, code (57), 2:15–27, 13:53–62, 14:9–23; Prelim. Resp. 19–21. And aside from the '217 Patent, Petitioner does not contend that any other reference of record characterizes round-tripping "a last resort" or as a treatment to be used with "patients that might otherwise not be able to be treated." Pet. 27.

Petitioner also attempts to blunt Patent Owner's teaching away arguments by citing Dr. Yadav's testimony stating that "[i]n some instances, the only alternative to round[-]tripping might be extraction, which could be even less desirable." Pet. 17 (citing Ex. 1003 ¶ 68); *see also* Ex. 1003 ¶ 80 (opining that "for some patients, round-tripping one or more teeth might be preferable over a different treatment (e.g., extracting the tooth) because canine teeth play a critical role in preventing collapse of the dental arch"), ¶ 83. Dr. Yadav fails to corroborate his assertion that round-tripping might be preferrable to extraction with citation to any objective evidence of record, and thus we accord it little weight. *See Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9, 15 (PTAB August 24, 2022) (precedential) (explaining that declaration testimony that "is conclusory and unsupported" and which "adds little to the conclusory assertion for which it is offered to support . . . is entitled to little weight"). This shortcoming is all the more stark given that Sachdeva and Chishti-876 both teach extraction (*see*

Ex. 1007, 5:44–48; Ex. 1005, 2:25–28), and are either silent regarding round-tripping (Sachdeva), or expressly teach away from it (Chishti-876). In other words, Sachdeva and Chishti-876 appear to undercut Dr. Yadav's testimony that round-tripping can be preferrable to extraction, because they teach use of extraction and are either silent on, or teach to avoid, round-tripping.

In short, the Chishti patents disparage "moving a tooth along a distance greater than absolutely necessary to straighten the teeth" (Chishti-876) and "any motion of a tooth in any direction other than directly toward the desired final position" (Chishti-511), both of which are broad statements that appear to include in their scope of disparagement the more specific round-tripping movement taught in Becker. Petitioner itself concedes that "round-tripping should be avoided if possible." Pet. 17. As discussed above, Petitioner's attempts to portray round-tripping as a preferable or necessary option for some patients are weakly supported.

Against this backdrop, Petitioner asserts that, in view of Chishti-511's discussion of "need[ing] collision-free treatment paths," skilled artisans would have turned to Becker. Pet. 23–24 (citing Ex. 1004, 4:15–22). But on this record, and especially in view of the teachings away from round-tripping, Petitioner does not demonstrate a reasonable likelihood that a skilled artisan would have combined Becker's movement pattern with the Chishti systems and Sachdeva. In particular, the Petition and supporting materials lack sufficient argument and evidence for us to conclude that a person of ordinary skill in the art would have had reason to apply Becker's movement pattern ***in the context of an aligner treatment***.

Becker is a textbook relating to the orthodontic treatment of impacted teeth. Ex. 1006, 1 (Title). Patent Owner correctly states that "Becker is a different orthodontic treatment modality compared to the Chishti references," using "braces and numerous brackets, wires, and rubber bands, with the wire-and-bracket systems being attached directly and permanently to the teeth." Prelim. Resp. 21–22; *see also supra* Section II.D.4. "Becker involves traditional orthodontic practice: manual, by-eye adjustment of its archwires, elastic thread, and palatal wires by a treating orthodontist in repeated office visits." Prelim. Resp. 22. Chishti-511, in contrast, uses "treatment planning software" to "pre-stag[e] a series of tooth positions from which a sequence of appliances can be manufactured." *Id.*

On this record, we agree with Patent Owner that "Becker at best shows that round-tripping was an option in limited circumstances involving wire-and-bracket treatment." *See* Prelim. Resp. 3. Petitioner does not direct us to any persuasive evidence that using aligners to effect Becker's tooth transposition "would be appropriate or even possible." *Id.* at 22. As Patent Owner correctly notes, Petitioner does not point to any teaching in Becker regarding aligner treatment or corresponding treatment planning software. *Id.* at 23. Nor are we directed to any portions of Chishti-511, Chishti-876, or Sachdeva that mention using aligners to transpose teeth. These omissions are important because "[i]n contrast to treatment with braces, in which wires are manually adjusted by the orthodontist to move teeth reactively, aligner treatment involves treatment planning in which a detailed path of teeth is calculated in advance." *Id.* at 4. Given these differences, Petitioner has not persuasively explained why Becker's tooth movement pattern and mechanism would have been of interest to a skilled artisan who was

motivated to use "collision identification and avoidance techniques to supplement Chishti-511's treatment planning system." Pet. 20.

In this regard, we agree with Patent Owner that "Petitioner does not seriously suggest that the type of treatment taught by Becker (a complex transposition of teeth) would have been viewed as achievable with aligner treatment prior to the '217 [P]atent's priority date." Prelim. Resp. 22. Petitioner asserts that aligners alone could be used to carry out Becker's round-tripping "if only minor tooth movement is required to avoid colliding with a second tooth," but "where more significant tooth movement is needed to avoid a collision," a person of ordinary skill in the art "may utilize aligners with attachments, such as attachments shown in Becker." Pet. 24–25 (Ex. 1003 ¶¶ 81–82). Petitioner fails to provide clarity on which tooth movements it deems "minor" or "significant," or how Becker's manual attachments can be reconciled with the attachments in an aligner system.

Dr. Yadav cites prior art that discusses using hardware attachments with aligners, such as with the "Essix aligner[]."[11] *See* Ex. 1003 ¶ 82 (citing Ex. 1004, 6:21–24, 8:47–53, 10:1–6; Ex. 1016, 26, 30–38, 34, 35 (Fig. 2-24c), 37; Ex. 1018, code (57), 11:45–65; Ex. 1019, code (57), 3:21–48). But Petitioner fails to explain how the attachments Petitioner points to would "provide movements of the type Becker performs." Prelim. Resp. 24. Thus, although Petitioner shows that hardware, i.e., certain types of "attachments,"

[11] Neither the Petition nor Dr. Yadav explains what "Essix aligners" are. Information of record indicates, however, that they are a type of "[c]lear plastic tooth-moving appliances" and are best used with patients "whose chief complaint centers around mild to moderate alignment problems." Ex. 1016, 26.

can be used with aligners, it does not establish a reasonable likelihood that a person of ordinary skill in the art "would have understood" that "aligners may be used either alone or with attachments ***to achieve the type of round-tripping disclosed in Becker***," such that an artisan would have added "Becker's technique as an option for use in Chishti-511's path redefinition process." Ex. 1003 ¶¶ 82, 84 (emphasis added).

Beyond the prior art teachings related to round-tripping already discussed above, Petitioner cites two additional references to support its contention that "round-tripping was well known," i.e., Park and DeAngelis. *See* Pet. 18 (citing Ex. 1024 (Park), 5–6; Ex. 1023 (DeAngelis), 2, Fig. 1B; Ex. 1003 ¶ 69). Neither of these references teaches or suggests using round-tripping with aligners. Thus, even assuming that the claimed version of round-tripping was "sometimes necessary" for some patients, what is missing from the Petition is a persuasive indication that a person of ordinary skill in the art would have been motivated to use such a movement pattern in connection with an aligner system.

In sum, we consider the prior art "as a whole for what it teaches." *Medichem*, 437 F.3d at 1166 (emphasis omitted). Chishti-511 teaches that moving a tooth in any direction other than directly toward its final position—which includes the claimed round-tripping and other types of movements—is sometimes necessary but is minimized in the system of Chishti-511. Ex. 1004, 4:9–15. The later-filed Chishti-876 teaches that moving a tooth a greater distance than necessary to straighten the teeth is highly undesirable, has potential negative effects, and is avoided in the algorithm of Chishti-876. Ex. 1005, 14:46–51. Becker teaches that round-tripping can be useful in certain rare situations to transpose teeth, at least

when using non-aligner hardware. Ex. 1006, 5–8. What is missing from the Petition is any persuasive indication that as of the priority date, 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 the Chishti patents' disparagement of round-tripping generally in their systems.

For the above reasons, we determine that the information presented does not establish a reasonable likelihood that Petitioner would prevail in showing that at least one challenged claim of the '217 Patent is unpatentable.

III. CONCLUSION

After considering the arguments and evidence of record, we determine that Petitioner has not demonstrated a reasonable likelihood of prevailing with respect to any claim challenged in the Petition. Accordingly, we do not institute an *inter partes* review.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that the Petition is *denied*, and no trial is instituted.

For PETITIONER:

Luke McCammon
Charles Collins-Chase
Jency Mathew
Anthony J. Berlenbach
FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, LLP
Luke.McCammon@finnegan.com
Charles.Collins-Chase@finnegan.com
Jency.Mathew@finnegan.com
Anthony.Berlenbach@finnegan.com
ClearCorrect-IPR-Attorneys@finnegan.com

For PATENT OWNER:

Michael T. Rosato
Patrick M. Medley
Matthew A. Argenti
WILSON SONSINI GOODRICH & ROSATI
mrosato@wsgr.com
pmedley@wsgr.com
margenti@wsgr.com