

Filed on behalf of: Align Technology, Inc.

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ALIGN TECHNOLOGY, INC.,
Petitioner,

v.

DENTAL MONITORING SAS,
Patent Owner.

Case No. IPR2024-00110
Patent No. 11,109,945

PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE

TABLE OF CONTENTS

	<u>Page</u>
I. Introduction.....	1
II. Level of Skill	2
III. Claim Construction.....	5
IV. The Challenged Claims are Unpatentable as Obvious over Kim, Invisalign, and Salah.....	6
A. POSAs had Reason to Combine Kim, Invisalign, and Salah.....	6
1. PO's Arguments Regarding Prior Art Interpretation Fail.....	6
2. PO Fails to Undercut Frey's Relevance.....	11
B. The Prior Art Discloses the Claimed Analysis Step	12
1. PO's Hindsight Arguments Fail.....	13
2. Kim, Invisalign, and Salah Render Obvious the Claimed Evaluation of Interior and Exterior Tooth Outlines.....	14
V. Conclusion	18
VI. Certificate of Compliance.....	19
VII. Appendix – Petitioner's Updated Exhibit List	20

I. INTRODUCTION

The petition established that claims 1-2 and 4-6 (“Challenged Claims”) of the ’945 patent were obvious over the teachings of the prior art, as illustrated by Kim, Invisalign, and Salah.

In response, Patent Owner (“PO”) attacks references individually instead of addressing the proposed combination as a whole and reinterprets or mischaracterizes the references to avoid their plain teachings. PO also proposes claim constructions and an alternative level of skill that do not materially affect patentability, raises an unpersuasive challenge to prior art status, and misinterprets both the claims and the petition. As discussed below, none of PO’s arguments have merit.

PO does not dispute—indeed readily admits—that aligner fit assessment was a routine part of orthodontic aligner treatment long before the priority date. The prior art shows that analyzing separation between teeth and aligner was part of that assessment. Yet PO would have the Board conclude that it was inventive to perform this common assessment using a cellphone, despite the prior art of record undisputedly showing that it was also well-known to capture images on a cellphone for remote analysis during dental treatment. Under a proper assessment considering the teachings of the cited references as a whole, the challenged claims are irrefutably obvious.

II. LEVEL OF SKILL

PO proposes a different level of skill, but also asserts that its proposal is “not materially different.” POR, 3-5. Thus, PO’s proposal does not undermine the obviousness of the ’945 patent’s claims. EX1048, ¶¶5-9.

Nonetheless, PO proposes to dismiss Dr. Foroosh’s opinions because he did not consult a dental professional, suggesting that Dr. Foroosh misunderstood terms in the prior art. *Id.*; see EX2030, ¶57 (asserting references use “terms that would have had a specific meaning to dental professionals”). As an initial matter, PO’s definition does not require consultation with a dental professional and is instead satisfied by familiarity with, e.g., medical imaging. POR, 3-4. Dr. Foroosh has ample experience with medical and dental imaging. *E.g.*, EX1002, ¶¶6-9; EX1003, 14, 15, 21, 26, 32. Beyond that, PO made similar arguments in IPR2023-01369 that Dr. Foroosh lacked such understanding of a dental professional. Align responded by presenting testimony from a dental professional, Dr. Maureen Valley, demonstrating that PO’s criticisms relating to Dr. Foroosh’s understanding of dental concepts were unfounded. See IPR2023-01369, Paper 23 (citing Valley declaration as EX1035).

PO’s dental expert, Dr. Kusnoto, has now confirmed the deficiency of PO’s arguments, admitting that Dr. Foroosh correctly understood the terms used in each of the Kim, Invisalign, and Salah grounds references, as well as the Frey blog

reference, taking issue only with the interpretation of an image in Invisalign. *See* EX1052, 43:23-44:12 (no terms misunderstood in Kim), 44:16-45:11 (“Are there any terms from the Invisalign reference, Exhibit 1006, that you believe Dr. Foroosh interpreted differently than a dental professional would have? ... I think with the exception of the illustration of poor fit, okay, for the most part he’s getting the terminology correct.”), 45:18-24 (regarding Salah, “I think for the most part he also get it correct”), 46:3-47:25 (“no disagreement in term of terminology” for Frey). Indeed, Dr. Kusnoto admitted that a person with qualifications like Dr. Foroosh, such as “a researcher, imaging scientist, who has work[ed] a lot in this field...can certainly know the relevant of the aligner’s treatment.” EX1052, 27:7-28:6; *see* EX1002, ¶6-13 (extensive research experience in imaging science, including medical and dental imaging); EX1003; EX2048, 12:23-15:5, 16:19-10 (dental and medical imaging experience); EX2054, 32:20-33:3 (same).¹

PO also asserts that the relevant field is “aligner treatment,” despite the claims being directed to image analysis of dental arch images, reciting steps of

¹ Further undercutting PO’s position, PO’s non-dental expert, Dr. Mongan, conceded that he had formed his opinions regarding the Kim reference before even consulting Dr. Kusnoto. EX1051, 29:15-31:15.

acquiring images, determining outlines in the images, and comparing the outlines to determine a score. POR, 4; *see* EX1001, claim 1; *see also id.*, claims 2, 4-6 (steps including measuring distances in pixels, and comparing to thresholds). PO's argument in this case is the same as in the parallel IPR of the '248 patent (IPR2024-00052), which PO treats as analogous to this IPR. *See* POR, 41-42; IPR2024-00052, Paper 20 at 3-5. Yet PO's description of the relevant field disagrees with the '248 patent's specification, which states that the relevant field was "dental arch image analysis." EX2061, 1:6-7; EX2054, 123:13-24. Dr. Kusnoto did not dispute this disclosure in his deposition. EX1052, 22:20-23:3. Dr. Kusnoto conceded that his opinion regarding relevant field was limited to the "clinical application" of what was claimed, and that "there are many other nuance here of the invention that not directly related to the aligners, even though at the end it relates to it." EX1052, 21:4-22:18. By focusing on a context where the claimed invention may be applied, rather than on the "embodiments, function, and structure of the claimed invention," PO distorts the relevant field to inject a seeming requirement of orthodontic expertise. *In re Bigio*, 381 F.3d 1320 (Fed. Cir. 2004); *see also In re Wood*, 599 F.2d 1032, 1036 (C.C.P.A. 1979) (refusing to credit Applicant's assertions of relevant field contrary to "statements made in their own specification").

Further, as discussed below in more detail, the errors PO purports to identify involving dental knowledge fail to withstand scrutiny. *Infra* §§IV.A-B.

Accordingly, PO's arguments attacking Dr. Foroosh's expertise fail.

III. CLAIM CONSTRUCTION

PO proposes constructions for two terms. Regarding "shape of an orthodontic aligner," PO does not argue that this term is limiting, and in any event makes no arguments relying on its construction. POR, 15-16. The claims are thus unpatentable regardless of this construction. *See Real Time Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) ("The Board is required to construe 'only those terms...that are in controversy, and only to the extent necessary to resolve the controversy.'" (alteration in original) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

Regarding the recited "interior and exterior tooth" determinations, PO's only proposal is that outlines must be detected for each of plurality of teeth and the corresponding parts of the aligner. POR, 16-19. As one example, PO points to Fig. 8 of the '945 patent, for which a single, continuous outline extending across a plurality of teeth and an aligner spanning the same teeth is determined, with each tooth corresponding to at least part of the outline. POR, 19. This proposal also makes no difference to the case presented in the petition, as the petition expressly

proposed detecting outlines of the free ends of each tooth (and the corresponding parts of the aligner). Pet., 31-34; *infra* §IV.B.2.

IV. THE CHALLENGED CLAIMS ARE UNPATENTABLE AS OBVIOUS OVER KIM, INVISALIGN, AND SALAH

The POR addresses only independent claim 1. As discussed below, PO fails to rebut the petition's showing of obviousness.

A. POSAs had Reason to Combine Kim, Invisalign, and Salah

PO raises several arguments against POSAs' rationale to combine Kim, Invisalign, and Salah, but each fails, as discussed below.

1. PO's Arguments Regarding Prior Art Interpretation Fail

Rather than address the motivation presented in the petition (*e.g.*, Pet., 17-23), the POR attacks caricatures of those arguments and Dr. Foroosh's understanding of terms taught in Kim, Invisalign, and Salah. POR, 20-35, 47-57. First, PO misconstrues the references themselves. Second, PO mischaracterizes the petition's arguments. Third, PO baselessly attacks Dr. Foroosh's focus on aspects relevant to remote assessment (the purpose of the proposed combination), rather than steps that would require in-office treatment. And finally, PO advances mistaken and unsupported attacks on the feasibility of the combination. These arguments neither undermine the rationale advanced in the petition nor Dr. Foroosh's testimony.

To begin with, PO misconstrues Kim. PO argues that there is no motivation to combine Kim with Invisalign because, in PO's view, Kim's teaching to obtain and check "a photo or a video of the clear aligner ***currently worn by the orthodontic patient***" does not disclose an image of the clear aligner on the patient's teeth. EX1005, ¶66; POR, 37. This contradicts Kim's plain statement, based only on *ipse dixit* from PO's experts. Despite PO's arguments, Kim does not limit the dentist's assessment of the image to whether the aligner is damaged or worn out of sequence. POR, 24; EX2030, ¶74. Moreover, the other prior art of record, including Invisalign, confirms that assessments of whether an aligner is (in Petitioner's words) "in a working condition" are naturally made when the aligner is worn on the teeth. POR, 20; EX1006. In contrast, PO points to no evidence supporting the assertion that photos of aligners on their own provided dental practitioners with meaningful information during treatment.

Nor can PO demonstrate that aligner fit is not a relevant consideration in Kim. Indeed, while Dr. Kusnoto, to support this conclusion, emphasizes that "[a]ssessing aligner fit is different from assessing teeth alignment" (EX2030, ¶76), he admitted that these two assessments were usually done together, with aligner fit being routinely assessed to track progress. EX2030, ¶¶46-48; EX1052, 29:10-30:15, 31:16-32:16. Likewise PO's assertion that dental practitioner input is essential to understanding Kim's disclosure doesn't hold water: Dr. Mongan

admitted reaching his conclusions regarding this teaching in Kim without even consulting Dr. Kusnoto. *See* EX1051, 29:15-31:15.

In any event, the case advanced in the petition does not depend solely on Kim's disclosure of capturing images of aligners in a service position. PO ignores the petition's argument that, regardless of whether Kim is interpreted to expressly disclose this, doing so would have been "readily apparent in view of Invisalign's teachings" showing how properties useful in assessing aligner fit are visible in images of teeth with aligners in a service position, to apply known evaluation methods for aligner fit to analyze a photo or video of the aligner worn by the patient. Pet., 17-19.

PO further misconstrues the motivation to combine Kim with Salah. PO asserts that the petition presented **no** reason to combine Kim and Salah other than an assertion that Kim teaches computer image analysis, which PO contends is inaccurate. POR, 38. This is wrong for multiple reasons. First, PO has selectively omitted the full statement in the petition materials, which was "Like Kim, Salah teaches application of computer image analysis to dental images for orthodontic treatment purposes." Pet., 21; EX1002, ¶61. It is undisputed that Salah teaches such computer image analysis. Kim also teaches analysis of images on computers: a "photo or video" is transmitted to an "orthodontist terminal" (computer, *see* EX1005, Fig. 1) where a doctor can analyze it ("the orthodontist checks [the] photo

or video”). EX1005, ¶¶66. While Kim does not detail all methods for such analysis, the petition explained that POSAs would have known how to perform assessments suggested by Kim and Invisalign using image processing software such as that taught by Salah for edge detection. Pet., 20-21; EX1002, ¶¶59-61. PO fails to address, much less rebut, this rationale.

PO also fails in its attempt to attack Dr. Foroosh’s understanding of the references. PO asserts that Dr. Foroosh misunderstood various dental teachings of Kim, Invisalign, and Salah, but as noted above, Dr. Kusnoto conceded that Dr. Foroosh correctly understood the terms used in each of these references. *See* EX1052, 43:23-47:25; *supra* §II. For example, PO relies on Dr. Kusnoto’s testimony that Dr. Foroosh misunderstood Salah’s teaching to acquire cellphone images of teeth, including teeth fitted with orthodontic appliances. EX2030, ¶83 (quoting a sentence in EX1002, ¶73); *see* POR, 33-34, 47-48. But in cross-examination, Dr. Kusnoto admitted that Dr. Foroosh was correct in his statement. 54:20-55:19 (“Q: And the sentence reads ‘Salah similarly teaches acquiring dental images with a cellphone, including of teeth fitted with orthodontic appliances.’ That sentence is accurate, correct? A: Yes.”). PO also highlights various terms in Invisalign that Dr. Foroosh allegedly ought to have considered, but PO does not argue that any of these terms would have a bearing on the proposed combination. POR, 38-41.

PO's attack on Dr. Foroosh's focus on aspects relevant to image analysis reflects a broader problem with PO's case: it ignores the fact that the combination is directed to remote image analysis of dental images. By suggesting Dr. Foroosh ought to have focused on physical in-office treatment actions (POR, 39-40), rather than aspects quantifiable in images, PO ignores the perspective of a POSA looking to improve and implement **remote treatment** techniques like those taught in Kim and Salah by focusing on measurements that can be performed remotely on images, such as Invisalign's aligner fit measurements.

PO also argues (POR, 40-43) that the example used by Invisalign to show poor aligner fit was not representative, and that, according to Dr. Kusnoto, in more representative images "the [tooth-aligner] separation cannot be assessed with precision." EX2030, ¶¶61-63. First, this argument seeks to rewrite the Invisalign reference by ignoring its plain illustration of such an assessable separation. Further, PO's assertion is unsupported: Dr. Kusnoto provides no analysis of any of the images he calls more representative. *See id.* It is also wrong. As Dr. Foroosh explains and shows, detecting relevant edges in those images would have been straightforward, even with techniques much less advanced than the image processing techniques taught by Salah. EX1048, ¶¶10-14.

PO lastly asserts that images of aligners worn on teeth would be low-contrast, and that Salah teaches away from such imaging. POR, 48-49. PO is

wrong. Salah's disclosure merely observes that higher-contrast areas can produce higher-contrast contours, not that maximal contrast is essential. *See* EX1008, 60:17-61:3; EX1048, ¶¶15-17. This falls far short of a teaching away. Under cross-examination, Dr. Mongan conceded he had done no tests or analysis to support his claim that aligners would have unacceptably low contrast, and he admitted that he merely meant they would have lower contrast than teeth alone. EX1051, 60:6-14, 62:3-13. Indeed, Dr. Foroosh confirms and demonstrates that images of aligners worn on teeth have sufficient contrast to reliably detect edges. *See* EX1002, ¶¶102-03; EX1048, ¶¶13-14, 17.

2. PO Fails to Undercut Frey's Relevance

PO argues that the Frey exhibit should be disregarded as non-prior art under 35 U.S.C. § 102(b)(1). POR, 58-60. This argument fails.

First, Frey is not a grounds reference. References are relevant to show many aspects, including level of skill and motivations of POSAs regardless of their prior art status. *See, e.g., Yeda Res. v. Mylan Pharms., Inc.*, 906 F.3d 1031, 1041-42 (Fed. Cir. 2018); Pet., 20-21 (Frey confirms motivation).

Section 102(b)(1) allows elimination of prior art disclosures by another if it was "obtained...directly or indirectly from the inventor[s]" or if the inventors had previously disclosed the subject matter publicly. PO asserts that Dr. Frey had met with unspecified parties from Dental Monitoring and seen unspecified Dental

Monitoring marketing materials. POR, 58-59. Dental Monitoring is not an inventor. PO presents no evidence regarding whether any of these unspecified disclosures were obtained directly or indirectly from the inventors of the '945 patent. PO argues the '945 patent “confirms” the exception applies (POR, 59), but PO offers no inventor testimony or other evidence as to which, if any, claim elements derived from the inventors as opposed to other sources or being well known in the art. Thus, PO fails to establish the applicability of either 102(b)(1) exception to the Frey publication.

Further, PO’s claims are undermined by its own evidence. In the earlier blog post PO points to, Dr. Frey describes Dental Monitoring’s photo monitoring plan, which includes remote patient-acquired intra-oral images, with Invisalign patients taking photos “with aligners in place.” EX2053, 6. Far from identifying these offerings as new, Dr. Frey states regarding Dental Monitoring’s various photo monitoring plans that “[w]e routinely do this for international and out-of-state patients already.” EX2053, 7.

B. The Prior Art Discloses the Claimed Analysis Step

PO advances several arguments against the proposed combination of references, but each argument fails.

1. PO's Hindsight Arguments Fail

PO accuses Dr. Foroosh of hindsight because he opined on the obviousness of deep learning as claimed in the '248 patent, but not for the '945 patent, which does not claim deep learning. POR, 41-44. This argument is implausible on its face, as PO itself proposed different levels of skill for the different patents, with the '248 requiring familiarity with “machine learning or artificial intelligence” and the '945 substituting familiarity with “image analysis techniques or algorithms.” POR, 3-4; IPR2024-00110, Paper 20 at 3.

Moreover, PO mischaracterizes the testimony. Dr. Foroosh made it clear that he was not guided by whether the claims recited deep learning; rather, similar motivations would lead POSAs, at their preference, to either use deep learning (rendering the '248 patent obvious) or use the other image processing techniques taught by Salah (rendering the '945 patent obvious). *See* EX2054, 157:21-160:1 (“I mean I don’t care whether they’re in the claims or not....” A POSA could say “I don't want to do deep learning. I want to go a different route. I'm going to use other disclosures of image analysis, methods of Salah....[T]here is motivation for that, and...that combination would also work.”). Salah clearly teaches deep learning and other image processing algorithms are options to determine contours and other discriminant information, including detecting objects. EX1008, 34:5-36:14.

Motivations to use known options are non-exclusive, and PO cannot impart patentability to obvious claims by reciting them individually.

2. Kim, Invisalign, and Salah Render Obvious the Claimed Evaluation of Interior and Exterior Tooth Outlines

PO raises several arguments (POR, 50-58) against the proposed combination, but these arguments fail.

PO repeatedly attacks the references individually, rather than addressing the proposed combination. For example, PO admits that Salah discloses analyzing images of teeth, including teeth fitted with appliances, but attacks its failure to expressly describe imaging teeth with the precise type of appliance recited in the claims. POR, 51-52. This fails to address the petition's argument that a POSA would be motivated to analyze such images based on the combined teachings of the prior art. *E.g.*, Pet., 17-24, 32-34, 38-39. PO also mischaracterizes Salah, saying "Salah never discloses recognizing which detected contours correspond to teeth as opposed to something else." POR, 52. In fact, Salah detects contours of various objects in the mouth, and expressly discusses detecting a "contour of the gums." EX1008, 56:5; *see also id.*, Fig. 11 (illustrating similar discriminating information—reflectivity—in arch image showing appliance as well as other oral structures such as tongue and gums); POR, 54; Pet., 30 (noting this disclosure).

PO also suggests that POSAs would have ignored Invisalign's image of teeth because it was not literally taken by a cellphone. PO, 55-56. Of course, this argument ignores that Invisalign published in 2003—at a time when cellphone cameras were rare and low quality, and well before the 2017 date relevant to the '945 patent, at which time cell phone cameras capable of obtaining high quality images were commonplace. Moreover, PO's argument again attacks the references individually, as both Salah and Kim teach obtaining and using dental images taken by cell phones.

PO also argues that the proposed combination does not meet the requirement of determining outlines of each of a plurality of teeth (and the corresponding aligner). However, the petition expressly argued that a POSA would use image processing software, as taught by Salah, to detect “edges delineating the occlusal ends of each of a plurality of depicted teeth and edges delineating the tooth-shaped surfaces of the aligner corresponding to each tooth.” Pet., 31; *see also id.*, 33-34 (“measuring a distance between an outline of each tooth and the corresponding outline for the aligner, using the image processing software of Salah to detect each outline via contour detection”); EX1002, ¶¶83-87. The petition also expressly pointed out that Invisalign itself included arrows pointing to *multiple* teeth's separation from the aligner, further motivating the detection of edges of each of a plurality of teeth and the corresponding edges of the aligner. *See* Pet., 31-32.

PO argues that Canny edge detection alone does not identify which edges correspond to which teeth (POR, 52-53); however, this does not answer the argument advanced in the petition. Dr. Foroosh used Canny edge detection as an example of how one simple type of image processing taught by Salah can detect outlines. EX1002, ¶83. PO asserts “Petitioner does rely on any other image processing software or any other way of identifying the contours.” POR, 53. This is false. The petition never limited its proposal to the example shown by Dr. Foroosh; it expressly proposed to use “image processing software” as taught by Salah to detect outlines for each tooth and aligner part. Pet., 31; EX1002, ¶82.

Indeed, Dr. Foroosh explained that “it was also known that more advanced options for contour detection could go beyond mere detection of edges, and also provide *specific identification of the objects* found in different regions defined by the detected edges,” and that POSAs could use “computer vision techniques like Salah’s *various image processing software options* for detecting objects and the contours defining the objects’ edges.” EX1002, ¶83; *see also id.*, ¶¶33-34, 102 (“Salah, for example, teaches determining outlines for a plurality of objects, including teeth. (citing EX1008, 23:4-8 (using detected gingival margins to delimit teeth and “determine which parts of the initial reference model correspond to which teeth”), 34:6-7, Figs. 6a-b); Pet., 4-5, 31-33, 38-39. PO neither disputes nor rebuts this evidence and argument, nor does it identify any teaching in the ’945

patent of new image processing techniques to produce the claimed operations.²

PO's attempt to reconstrue the petition to avoid the teachings of the prior art should not be credited.

PO finally argues that the references fail to disclose comparison of outlines to determine a score, asserting that Kim does not relate to assessing aligner fit and that "Invisalign never suggests making a measure of separation." POR, 57-58. PO is mistaken regarding Kim, as explained above and in the petition. *Supra*, §IV.A.1; Pet., 25-26, 33-34. And regarding Invisalign, it expressly teaches that when worn, aligner separation of ">1 mm" indicates poor seating, whereas "<1 mm" is

² Indeed, even PO's criticism of Dr. Foroosh's manual labeling of the example image produced by using the Canny algorithm for edge detection (POR, 52-53) is unfounded. The claims are open-ended, and while image processing software must be used when performing the recited determination, they do not exclude use of other inputs, including manual inputs, in conjunction with image processing software. *Cf.* EX1051, 48:10-49:8 (admitting human using image processing software can identify edges), 116:25-117:22 (interpreting claims to require determination performed *entirely* by image processing software, without using *any* knowledge based on human input).

acceptable. EX1006, 1. To say such disclosure *never suggests making a measure of separation* is nonsense.

Accordingly, PO's arguments against the proposed combination fail.

V. CONCLUSION

For the reasons set forth above, claims 1-2 and 4-6 of the '945 patent are unpatentable and should be canceled.

Respectfully submitted,

Dated: October 4, 2024

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VI. CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. §42.24(d), the undersigned certifies that this Reply complies with the type-volume limitation of 37 C.F.R. §42.24(c). The word count application of the word processing program used to prepare this Reply indicates that the Reply contains 3,787 words, excluding the parts of the brief exempted by 37 C.F.R. §42.24(c).

Dated: October 4, 2024

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VII. APPENDIX – PETITIONER’S UPDATED EXHIBIT LIST

Exhibit No.	Description
1001	U.S. Patent No. 11,109,945 to Salah et al.
1002	Declaration of Dr. Hassan Foroosh
1003	Curriculum Vitae of Hassan Foroosh, Ph.D.
1004	U.S. Patent Application No. 16/001,049 File History
1005	U.S. Patent Pub. No. 2017/0281313 to Taewon Kim
1006	Align Technology, Invisalign Clinical Monitoring Guide (2003) (archived September 26, 2003, at http://web.archive.org/web/20030926024959/http://www.invisaligncec.com:80/consistent/pdfs/ICMG_Final.pdf)
1007	Maninis et al., “Convolutional Oriented Boundaries: From Image Segmentation to High-Level Tasks,” <i>arXiv.org</i> (Apr. 28, 2017)
1008	Translation of PCT Pub. No. WO 2016066651 to Salah et al.
1009	Scott Frey, Blog – The Ortho Cosmos, (archived May 4, 2017, at http://web.archive.org/web/20170504155213/http://theorthocosmos.com:80/blog)
1010	Declaration of Nathaniel E. Frank-Wright
1011	Declaration of Mitra Derakhshan
1012	PCT Pub. No. WO 2016066651 to Salah et al.
1013	Joint Stipulation and Order of Voluntary Dismissal Without Prejudice (Dkt. No. 90), <i>Dental Monitoring SAS v. Align Technology, Inc.</i> , No. 3-22-cv-07335-WHA (N.D. Cal.)
1014	Criminisi et al., “Single View Metrology,” <i>International Journal of Computer Vision</i> 40(2) (2000)

1015	Krizhevsky et al., “ImageNet Classification with Deep Convolutional Neural Networks,” <i>Advances in Neural Information Processing Systems</i> 25 (2012)
1016	Patrick Cavanaugh, “Visual Cognition” <i>Vision Research</i> 51 (2011)
1017	Prasad et al., “Learning Class-specific Edges for Object Detection and Segmentation,” <i>Computer Vision, Graphics and Image Processing: 5th Indian Conference, ICVGIP 2006</i> (2006)
1018	Second Declaration of Dr. Hassan Foroosh (Served, not filed)
1019	Second Affidavit of Nathaniel E Frank-White (Served, not filed)
1020-36	Intentionally Left Blank
1037	Deposition Transcript of Dr. John Mongan (July 23, 2024)
1038	Deposition Transcript of Dr. Budi Kusnoto (Aug. 9, 2024)
1039-47	Intentionally Left Blank
1048	Reply Declaration of Dr. Hassan Foroosh
1049-50	Intentionally Left Blank
1051	Deposition Transcript of Dr. John Mongan (Aug. 28, 2024)
1052	Deposition Transcript of Dr. Budi Kusnoto (Sep. 6, 2024)

CERTIFICATE OF SERVICE

The undersigned certifies that the foregoing Petitioner's Reply to Patent Owner's Response and Exhibits 1037-1038, 1048, and 1051-1052 were served on October 4, 2024, at the following electronic service addresses:

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