

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

3SHAPE A/S and 3SHAPE INC.
Petitioner

v.

ALIGN TECHNOLOGY, INC.
Patent Owner

Case IPR2020-00173
Patent 8,102,538

PATENT OWNER PRELIMINARY RESPONSE

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TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	ARGUMENT.....	3
A.	The Board should deny institution because the petition fails to show a reasonable likelihood of prevailing on Grounds 1 and 2.....	4
1.	3Shape’s obviousness combinations relying on Okamoto and Xu are legally deficient and hindsight-driven.....	4
a.	Both Okamoto and Xu are non-analogous art.	5
b.	The alleged motivation to combine is deficient.	10
c.	The alleged expectation of success is deficient.....	13
2.	Ground 2 combines a hand-held intraoral scanner, a desktop microscope, and a lithography microscope.....	15
a.	The alleged motivation to combine is deficient.	15
b.	The alleged expectation of success if deficient.....	17
c.	The combination is the result of hindsight bias.....	22
3.	Dr. Dianat admitted that he lacks expertise in the relevant technology and his opinions should be given no weight.	23
B.	The Board should exercise its discretion and deny institution because the petition is deficient, misleading, and tactical.	25
1.	3Shape’s petition fails to identify how the challenged claims are to be construed with respect to three terms.	26
2.	The petition fails to address a necessary <i>Graham</i> factor under the construction 3Shape advanced before the ITC.	27
3.	Two out of the three references were cited during original prosecution, a fact that 3Shape’s petition entirely omits.....	30
4.	The ITC has conducted a trial on the ’538 patent and will soon make a determination based on the same references.	31

C. 3Shape has not justified multiple petitions against the '538 patent....34

III. RELIEF REQUESTED37

PATENT OWNER EXHIBIT LIST

Exhibit No.	Description
2001	Initial Determination on Violation of Section 337 and Recommended Determination on Remedy and Bond, In the Matter of Certain Color Intraoral Scanners and Related Hardware and Software, Inv. No. 337-TA-1091, issued March 1, 2019 (Redacted Public Version)
2002	Commission Opinion, In the Matter of Certain Color Intraoral Scanners and Related Hardware and Software, Inv. No. 337-TA-1091, issued December 19, 2019 (Redacted Public Version)
2003	U.S. Patent Publication No. 2016/0022389 A1 to Esbech <i>et al.</i> and assigned to 3SHAPE A/S
2004	Deposition Transcript of Sohail Dianat, Ph.D., IPR2019-00157, August, 9, 2019
2005	Deposition Transcript of David Schaafsma, Ph.D., IPR2019-00163, February 7, 2020
2006	Respondents 3Shape A/S, 3Shape Trios A/S, and 3Shape Inc.'s Pre-Hearing Brief, In the Matter of Certain Dental and Orthodontic Scanners and Software, Inv. No. 337-TA-1144 (Redacted Public Version)
2007	Initial Determination Extending the Target Date by 30 Business Days, In the Matter of Certain Dental and Orthodontic Scanners and Software, Inv. No. 337-TA-1144, issued on March 6, 2020
2008	Defendants' Memorandum in Support of its Unopposed Motion for Mandatory and Discretionary Stay Pending Proceedings at the International Trade Commission, <i>Align Tech., Inc., v. 3SHAPE A/S et al.</i> , No. 1:18-cv-01950 (D. Del.) (March 8, 2019)
2009	Information Disclosure Statement from the Prosecution History of U.S. Patent No. 7,724,378

I. INTRODUCTION

The '538 patent describes and claims a first-of-its-kind color scanning device for determining the surface topology and associated color of a three-dimensional structure, such as a patient's dentition. Depth data can be mapped to, or associated with, color data to provide for correct coloring of a 3D virtual model. Associating color information with a 3D model is not straightforward, particularly when the positional information is obtained using a 3D-scanning method while the color information is obtained using a two-dimensional scanning method. EX1001, 1:46-54. This difficulty is compounded when relative movement between the object and the device occurs between acquisition of the 3D-topological data and acquisition of the two-dimensional image data. *Id.*, 1:54-61. The invention claimed in the '538 patent addresses the problems created by such relative movement by requiring that "the device is configured for maintaining a spatial disposition with respect to the portion that is substantially fixed during operation of the optical scanner and the imaging means." *Id.*, claim 1. As a result of this requirement, changes in spatial disposition during scanning can be substantially ignored, and depth data and color data will accurately correspond to the same reference array.

Unable to find any prior art that reads on the claimed device, 3Shape resorts to combining disparate technologies: Babayoff, Okamoto, and Xu. Okamoto is a desktop microscope. Xu is a lithography tool for analyzing sub-micron-level defects in semiconductor wafers. Babayoff, Align's own art, is a *monochromatic*

hand-held intraoral scanner. Using the teachings of the '538 patent as a roadmap, 3Shape cobbles together features from these unlike references. But 3Shape's combinations lack rational underpinning and are pervaded by hindsight bias.¹

This hindsight bias is also reflected in the testimony of 3Shape's declarant, Sohail Dianat, who asserts that combining the elements of Babayoff, Okamoto, and Xu "would only have required routine and conventional methods" and "knowledge generally available in the art." EX1024, ¶¶127, 193. Dr. Dianat is not credible. Dr. Dianat admitted in other proceedings involving related patents that he has never worked with, or even used, a confocal microscope like that of Okamoto or Xu. Dr. Dianat also admitted that his expertise is in image processing, not optical systems. In terms of his experience with optical systems, Dr. Dianat could cite only *one* instance in which he helped design a sensor for a light source in a printer. During deposition, Dr. Dianat could not answer basic questions about optical systems or explain the impact of modifying the systems described in Babayoff and Okamoto.

¹ In the related investigation pending before the U.S. International Trade Commission (ITC), Align has established with compelling evidence that Babayoff, Okamoto, and Xu do not teach or suggest the requirements of the claims, alone or in combination. Align does not waive any such argument and expressly reserves the right to raise such arguments even if not set forth in this preliminary response.

There are also a host of reasons why the Board should exercise its discretion to deny institution. These reasons stem from the fact that 3Shape’s petition: fails to identify how the challenged claims are to be construed with respect to three terms; does not put forth a proper obviousness analysis under a material construction that 3Shape advanced before the ITC; presents misleading arguments about what was considered during prosecution; comes at the tail-end of a trial before the ITC that considered the same art; and is one of two petitions filed on the same date against the same patent. 3Shape’s now longstanding tactic of delaying until after an ITC investigation to petition for IPR and then filing multiple petitions against the same patent is wasteful inefficient gamesmanship that frustrates the purpose of the AIA.

II. ARGUMENT

In this petition, 3Shape challenges claims 1-4 and 17-19 of the ’538 patent:

Ground	References	Basis	Claims
1	Japanese Patent publication No. 2001-82935 (“Okamoto”) (EX1003) in view of U.S. Patent No. 5,912,735 (“Xu”) (EX1026)	§ 103	1-2
2	PCT Publication No. WO 00/08415 (“Babayoff”) (EX1004) in view of Okamoto and Xu	§ 103	1-4, 17-19

3Shape’s petition should be denied on the merits because neither ground has a reasonable likelihood of prevailing. *See infra* Section II.A. The Board is also justified in exercising its discretion to deny the petition. *See infra* Section II.B-C.

A. The Board should deny institution because the petition fails to show a reasonable likelihood of prevailing on Grounds 1 and 2.

Both Grounds 1 and 2 rely on Okamoto for its alleged disclosure of a device for determining both the surface topology and associated color of at least a portion of a three-dimensional structure. Pet., 67-68 (admitting that Babayoff does not disclose this). Both Grounds 1 and 2 rely on Xu for the requirement of claim 1 that “the device is configured for maintaining a spatial disposition with respect to the portion that is substantially fixed during operation of the optical scanner and the imaging means.” *Id.*, 35-38, 53 (denoted as element [1.3]). Both grounds fail.

1. 3Shape’s obviousness combinations relying on Okamoto and Xu are legally deficient and hindsight-driven.

In the context of establishing obviousness, “a clear, evidence-supported account of the contemplated workings of the combination is a prerequisite to adequately explaining and supporting a conclusion that a relevant skilled artisan would have been motivated to make the combination and reasonably expect success in doing so.” *Personal Web Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 994 (Fed. Cir. 2017). It is not sufficient that two references *could be* combined by a POSA, rather a petitioner must establish that “a skilled artisan ... *would have been motivated to make* the combinations or modifications of prior art to arrive at the claimed invention.” *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015) (emphasis in original). Neither Ground 1 nor Ground 2 provides a sufficient explanation of why or how a POSA would have combined Okamoto and Xu.

a. Both Okamoto and Xu are non-analogous art.

Grounds 1 and 2 fail because Okamoto and Xu are non-analogous art. A reference qualifies as prior art for an obviousness determination “only when it is analogous to the claimed invention.” *In re Klein*, 647 F.3d 1343, 1348 (Fed. Cir. 2011). Prior art is analogous if it (1) “is from the same field of endeavor, regardless of the problem addressed” or (2) “is reasonably pertinent to the particular problem with which the inventor is involved.” *Unwired Planet, LLC v. Google Inc.*, 841 F.3d 995, 1000–01 (Fed. Cir. 2016) (quoting *In re Clay*, 966 F.2d 656, 658–59 (Fed. Cir. 1992)). The analogous-art inquiry looks to “the purposes of both the invention and the prior art.” *Id.* If a reference disclosure and the claimed invention have the “same purpose,” then the reference relates to the same problem. *Id.*

Okamoto and Xu are not from the same field of endeavor as the claimed invention. The field of endeavor of the ’538 patent is “optical scanners, particularly for providing a digital representation of three-dimensional objects including color.” EX1001, 1:18-20. The ’538 patent goes on to specify that “[t]he invention finds particular application in the surveying of the intraoral cavity.” *Id.* By contrast, Okamoto and Xu are *microscopes* that rely on a controlled relationship between the microscope optics and the microscope stage. EX1003, Abstract; EX1026, 3:40-46. Such arrangements are not suitable for surveying areas like the intraoral cavity. Indeed, Okamoto is a desktop microscope for measuring a “sample.” EX1003, ¶15.

Xu is a microscope for analyzing subsurface defects in semiconductor wafers in a clean room environment away from people. EX1026, 1:15-18; 2:21-22, 10:3-6.

3Shape asserts that Okamoto and Xu are in the same field because “[b]oth Okamoto and Xu disclose devices that include two optical systems: a confocal system for obtaining surface topology and a non-confocal system for obtaining color associated with such surface topology” and because both allegedly “obtain depth and color image data and then display the same.” Pet., 39-40. Regardless of whether Okamoto and Xu disclose optical systems or obtain depth and color data, they cannot survey areas such as the intraoral cavity or generate a surface topology and associated color. Rather, both Okamoto and Xu utilize a microscope stage for placement of a sample (or wafer in Xu) for measurement or analysis. EX1003, ¶15; EX1026, 9:28-43.² The limitations to using microscopy to sample information are readily apparent, as 3Shape has admitted in its own patent filings and Dr. Dianat has admitted on cross-examination in related matters. EX2003, ¶7 (3Shape’s U.S. Publication No. 2016/0022389, referring to Okamoto’s “[c]olor-recording scanning confocal microscopes” as “not suitable for handheld use”); EX2004, Dianat Dep.

² 3Shape’s petition agrees. Pet., 35 (“Okamoto uses a sample stage 30 to maintain the position of sample w. Ex.1003, ¶¶[0039]-[0040], Fig. 5.”); *id.*, 40 (“Like Okamoto, Xu uses a stage control to hold the stage in a fixed position.”).

Tr., IPR2019-00157, 196:21-197:8 (“Q Would a dentist typically grab a confocal microscope and then use it to scan someone’s teeth? . . . A Obviously, no.”).

Okamoto and Xu are not reasonably pertinent to the problem the invention solves. The ’538 patent describes a specific problem in the optical scanning art relating to the difficulty of “[a]ssociating color information with three-dimensional objects . . . , particularly when the position information is obtained by using a three dimensional scanning method, while the color information is obtained by using a two dimensional scanning method.” EX1001, 1:46-50. The ’538 patent explains that “conformally mapping the two dimensional color information onto the three dimensional surface model is difficult and it is common for mismatching of the color with three-dimensional points to occur.” *Id.*, 1:50-54. Even more specifically, the ’538 patent solves a problem that arises uniquely “where two-dimensional color detectors are used for obtaining the color information,” which makes it “difficult to accurately associate color information from the detectors with the correct points on the three dimensional surface model, *particularly where relative movement between the object and the device occurs between the acquisition of the three-dimensional topological data and acquisition of the two-dimensional image data.*” *Id.*, 1:54-61 (emphasis added). This problem commonly arises in intraoral scanning, where there is often movement between the device and the object in the

patient's mouth. *Id.*, 4:61-5:3 (noting the specific objective of maintaining a spatial disposition with respect to said portion that is substantially fixed during operation).

No such problem exists in a microscope system that uses a controlled stage for examining a sample, including the microscope systems of Okamoto and Xu. In those systems, the stages are movable to control the distance of the sample relative to the optics. EX1003, ¶¶18, 19; EX1026, 7:3-7. As a result of this control, the stage moves in a predetermined manner and the position of the sample on the stage relative to the optics will be known prior to scanning. This movement is necessary to obtain information at different heights. Even if the stage were not moved during scanning, the arrangements described by Okamoto and Xu would still not address the problem addressed by the '538 patent because such systems would then require a fixed distance between the sample and the microscope. Okamoto and Xu do not contemplate—let alone solve—the challenges associated with relative movement during the acquisition of surface topology and associated color information.

The invention claimed in the '538 patent specifically addresses the problem of relative motion between the object and the device that arises in the context of intraoral scanning by requiring that “the device [be] configured for maintaining a spatial disposition with respect to the portion that is substantially fixed during operation of the optical scanner and the imaging means.” EX1001, claim 1. As a

result of this configuration, changes in spatial disposition during scanning can be substantially ignored and depth data and color data can be accurately associated.

By contrast, Okamoto is directed to improving the display of the relationship between a site of measurement and a site in a three-dimensional display of a shape to avoid use of “artificial coloring,” which Okamoto states is not “easy on [the] eyes.” EX1003, ¶¶6-8. Xu is directed to a microscope that uses a laser/white light system for sub-micron particle detection in semiconductor wafers. EX1026, 1:15-18. The solution proposed in Xu, using a laser imaging system for semiconductor wafer analysis, aims to reduce the risk of contamination associated with traditional microscopy, “since a (relatively dirty) human is in close proximity to the wafer surface and because the presence of the microscope causes turbulent flow near the wafer which tends to pull in nearby contaminants to the wafer.” *Id.*, 1:67-2:6.

Looking, as the law requires, to “the purposes of both the invention and the prior art,” the systems of Okamoto and Xu do not have the “same purpose” as the invention claimed in the ’538 patent. *Unwired Planet*, 841 F.3d at 1000–01. The specific problem confronting the inventor of the ’538 patent was how to accurately associate color information received from a 2D image detector with points on a 3D surface model *where relative movement between the object and the device occurs* between the acquisition of the 3D-topological data and acquisition of the 2D image data. This is far removed from Okamoto’s concern with improving the appearance

of color information and Xu's concern with avoiding contamination. Furthermore, the purposes of Okamoto and Xu could not be the same as the '538 patent because both references describe microscope systems in which a *stage* is used to control the position of the sample relative to the device such that the problems associated with relative motion between the object and the device would not exist in the first place.

b. The alleged motivation to combine is deficient.

As discussed in detail below in Section II.B.2, 3Shape's petition does not address the differences between claim 1 and the asserted art under the construction 3Shape advanced before the ITC with respect to element [1.3]. The petition does admit, however, that "Okamoto does not expressly disclose that the 'operation by the optical scanner and the imaging means is at least substantially or effectively simultaneous such that movement (i.e., a change in spatial disposition) can be ignored' as construed by the ALJ and Patent Owner (partly) (§V.C.)." Pet., 36.

For this requirement, 3Shape's petition asserts that "Xu discloses '[a] laser imaging system [that] provides *contemporaneous, or substantially simultaneous* laser/white light viewing.'" *Id.*, 37 (emphasis in original). The alleged motivation to modify Okamoto to incorporate this aspect of Xu is "to reduce positional shifts when collecting scanned data" allegedly caused by "mechanical vibrations in the scanning device itself and/or movement of the object to be scanned" *Id.*, 40. 3Shape's rationale for combining Okamoto and Xu fails for multiple reasons.

First, 3Shape generically points to the use of optical system elements and scanning capabilities (e.g., obtaining color and depth data) as a reason to combine Okamoto and Xu to arrive at the claims. *Id.*, 39-40. At best, this indicates that a POSA *could have* incorporated some elements. It does not establish that “a skilled artisan . . . *would have*” done so. *Belden*, 805 F.3d at 1073 (emphasis in original).

Second, the petition fails to explain why Xu’s alleged simultaneous *viewing* would suggest a modification to Okamoto’s *scanning and imaging* operation. The portion of Xu cited in the petition pertains to “viewing,” not scanning and imaging. EX1026, 5:51-57; *see also id.*, 10:7-11 (“[T]he microscope image is displayed on a computer display (simultaneously with the laser image, if desired), either in a separate window on computer display (not shown), using appropriate software, or on a separate video monitor display (not shown).”). This teaching in Xu does not inform scanning and imaging because Xu does not simultaneously obtain depth and color image data, as explained in detail below. *See infra* Section II.A.1.c.

Third, 3Shape does not dispute that there is no teaching or suggestion in either Okamoto or Xu that “positional shifts when collecting scanned data” were a problem with Okamoto or desktop microscopes generally. Pet., 40. Rather, 3Shape relies on a string of extraneous references as alleged support for this proposition. *Id.*, 40-41; EX1024, ¶¶123-24. But unlike the extraneous references 3Shape cites for the alleged concern about mechanical vibration, Okamoto does not move its

stage during scanning so mechanical vibrations would not be an issue. EX1003, Fig. 5, ¶¶38-40. And 3Shape does not assert, let alone explain, how Okamoto could be used for (or even adapted to) map the topology and color of a moving object.

Nor do the extraneous references 3Shape relies on support the contention that mechanical vibration would have been a problem for Okamoto or Xu, as 3Shape alleges. Pet., 40-41; EX1024, ¶¶123-24 (citing EX1030, 49; EX1056, 79-80; EX1057, 629-630, Fig. 1, Suppl.2). EX1030 (Cogswell) at 49 merely discusses challenges to imaging biological samples. It does not address mechanical vibration. EX1056 (Jovanovski) at 79-80 does not describe a microscope system, nor does it describe mechanical vibrations. Jovanovski merely discusses a specific coordinate measuring machine having a granite worktable—a Merlin Mk II 750 Coordinate Measuring Machine (International Metrology Systems Ltd., Livingstone, UK). EX1057 (Sekar) at 629-630 just describes benefits and challenges associated with fluorescence resonance energy transfer (FRET) microscopy. It does not discuss whether mechanical vibrations are a problem or whether FRET is a solution.

3Shape and its declarant, Dr. Dianat, also fail to explain how incorporating anything from Xu into Okamoto would reduce positional shifts which, as noted, were not a concern for Okamoto. 3Shape and Dr. Dianat again cite *other* references that employ *other* techniques for reducing positional shifts in *other* systems. None of the cited techniques are, or relate to, simultaneous viewing or maintaining a

spatial disposition that is substantially fixed. EX1024, ¶124 (citing use of “solid granite and other vibration-damping optical worktables,” “3D profilometry . . . in conjunction with translational confocal microscopes,” adjusting “shutter speed and/or flash illumination,” “obtaining color data (alongside depth data) quickly”). 3Shape does not explain how or why these various extraneous references relate to incorporating Xu’s simultaneous viewing into Okamoto, or in what sense they are analogous to Okamoto and Xu. As a result, the combination fundamentally lacks rational underpinning. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 417-18 (2007).

Compounding these deficiencies, 3Shape’s petition cites to the ’538 patent itself as alleged support for why a POSA would have been motivated to combine Okamoto and Xu. *See, e.g.*, Pet., 40; EX1024, ¶123 (both citing EX1001, 4:61-5:3 as support for the alleged motivation to combine). This among other tell-tale signs, including 3Shape’s cobbling together of features from two *microscopes*, shows that 3Shape’s obviousness theory is tainted by hindsight bias. *Millennium Pharm., Inc. v. Sandoz Inc.*, 862 F.3d 1356, 1367 (Fed. Cir. 2017) (noting that an “inventor’s own path itself never leads to a conclusion of obviousness; that is hindsight.”).

c. The alleged expectation of success is deficient.

The petition asserts that “[m]odifying Okamoto’s device such that it maintained a spatial disposition between the portion that is substantially fixed during operation of the optical scanner and the imaging means would only have

required routine and conventional methods.” Pet., 42. 3Shape’s theory rests on the premise that Xu “simultaneously obtain[s] depth and color image data.” *Id.*, 43.

But Xu does not simultaneously obtain depth and color image data. Xu’s system provides simultaneous laser and white light illumination to analyze defects on a semiconductor wafer. EX1026, 1:15-18. The white light image provides color information to facilitate locating and identifying the defect. *Id.*, 2:50-56. The laser imaging system generates “a complete X-Y scanned laser image, *in a single plane of focus*, at video rates.” *Id.*, 6:7-9 (emphasis added). Xu displays the resulting images on a computer or video monitor. *Id.*, 6:11-12 (“Thus, the operator can scan through different levels of focus in real time, as with a conventional microscope.”). In this manner, Xu’s system allows an operator to view micron-level defects on a wafer by viewing *one plane at a time*. Xu does not scan through multiple planes in a single scanning operation to generate a model like Okamoto. EX1003, ¶¶23-24.

Capturing a laser image by performing an X-Y scan *one plane at a time* does not equate to “simultaneously obtain[ing] depth and color image data,” as 3Shape alleges. Pet., 43. 3Shape’s explanation of how a POSA would have incorporated Xu’s teaching into Okamoto is premised on this misunderstanding of Xu. Without assuming that Xu operates in the manner 3Shape alleges, there is no evidence in the petition to support that modifying Okamoto to maintain a spatial disposition

with respect to the portion that is substantially fixed *during operation* would have required only routine and conventional methods. Thus, the combination fails.

2. Ground 2 combines a hand-held intraoral scanner, a desktop microscope, and a lithography microscope.

Ground 2 of the petition is substantially the same as Ground 1 except that the base reference is Babayoff. Babayoff describes a monochromatic hand-held intraoral probe that admittedly does not teach or suggest a device for determining the surface topology and associated color of at least a portion of a 3D structure, as required by claim 1. Pet., 67-68. Ground 2 relies on Okamoto for this aspect and Xu, as in Ground 1, for the requirement that the device be configured to maintain a spatial disposition with respect to the portion that is substantially fixed during operation of the optical scanner and the imaging means. *Id.*, 35-38, 53. Ground 2 fails for the same reasons as Ground 1, *see supra* Section II.A.1, with the added problem that the combination with Babayoff is deficient and hindsight-driven.

a. The alleged motivation to combine is deficient.

3Shape alleges that a POSA would have incorporated Okamoto's color scanning system into Babayoff's monochromatic hand-held scanning system based on a general desire to obtain "the best color match of the dental prosthesis with the patient's teeth." Pet., 68. 3Shape does not point to anything in Babayoff, Okamoto, or Xu suggesting that such a desire existed, or that there was any known solution available in the art during the relevant timeframe. As with its Ground 1, 3Shape

resorts to extraneous references to support the alleged motivation. *Id.* But 3Shape fails to explain the relevance of these extraneous references to the combination, leaving significant logical gaps in the alleged motivation. *KSR*, 550 U.S. at 417-18. For example, the petition does not explain the relevance of EX1007, EX1008, and EX1016 to Babayoff's system, or why a POSA would have looked to these other sources for a motivation to combine the teachings of Babayoff, Okamoto, and Xu.

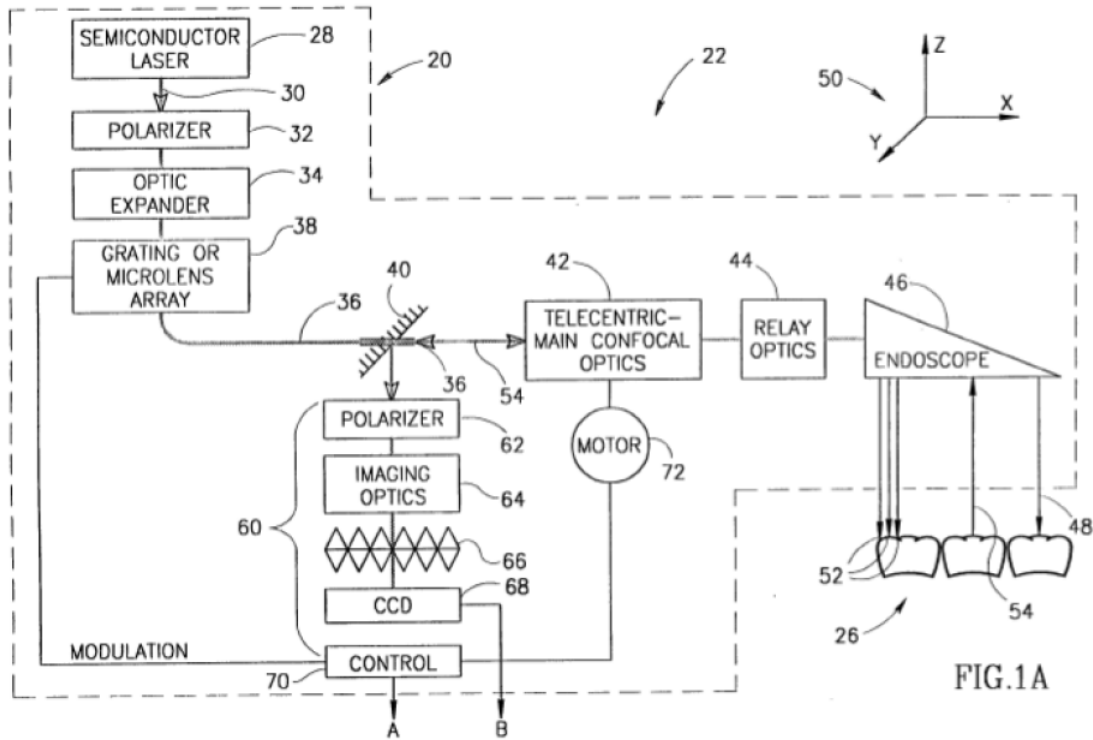
And regardless of what these extraneous references say, the desirability of tooth-prosthesis color matching is not related to any problem or issue encountered by Babayoff. There is no logical connection between Babayoff, Okamoto, Xu, and the alleged desirability of tooth-prosthesis color matching. Babayoff is directed to a *monochromatic* intraoral scanner for determining the three-dimensional structure of a tooth segment. EX1004, 8:12-17, 8:23-9:20. Okamoto's desktop microscope is directed to scanning objects placed on a microscope stage and is not intended to scan teeth. EX2004, Dianat Dep. Tr., IPR2019-00157, 196:21-197:8 ("Q Would a dentist typically grab a confocal microscope and then use it to scan someone's teeth? . . . A Obviously, no."). Xu is a lithography/metrology tool for examining sub-micron level defects on a semiconductor wafer. EX1026, 1:15-18. 3Shape's alleged motivation—a desire for tooth-prosthesis color matching—is generic and untethered to the specifics of the combination. It is thus insufficient to show why a POSA would have combined the references. *ActiveVideo Networks, Inc. v. Verizon*

Commc'ns, Inc., 694 F.3d 1312, 1328 (Fed. Cir. 2012) (holding that a rationale that is “generic and bears no relation to any specific combination of prior art elements . . . fails to explain why a person of ordinary skill in the art would have combined elements from specific references in the way the claimed invention does”).

b. The alleged expectation of success if deficient.

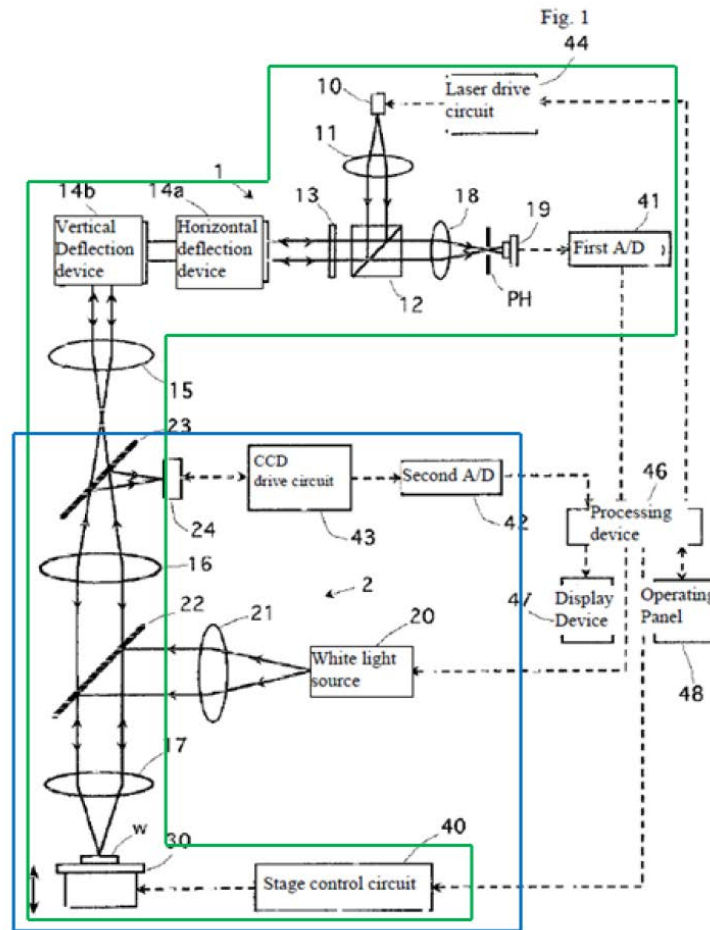
When it comes to demonstrating that a POSA would have had a reasonable expectation of success in incorporating Okamoto's color scanning system into Babayoff, 3Shape disregards significant structural and functional differences in how Babayoff's and Okamoto's systems operate. 3Shape also seeks to minimize the technical difficulties associated with adapting and miniaturizing Okamoto's two optical systems to fit the physical constraints of Babayoff's hand-held probe.

As illustrated below, Babayoff is directed to an intraoral scanner containing a single optical system 22 that includes: (1) a light source, semiconductor laser 28; (2) a polarizer 32; (3) an optical expander 34; (4) a grating or micro lens array 38; (5) a partially transparent mirror 40; (6) confocal optics 42; (7) relay optics 44; and (8) an endoscopic probing member 46. EX1004, 8:23-9:20. All these components can fit within the physical constraints of a hand-held scanning device. *Id.*, 4:15-17. Babayoff's system generates a monochromatic model using arrayed illumination, creating *numerous spots* on the object via an array of light beams. *Id.*, 10:5-11:5.



EX1004, Fig. 1A.

Okamoto is a desktop microscope that includes two optical systems: (1) a confocal optical system; and (2) a non-confocal optical system. EX1003, ¶¶16, 28. The confocal optical system includes the components highlighted in green below. *Id.*, ¶16, Fig. 1. The non-confocal system includes the components highlighted in blue below. *Id.*, ¶28, Fig. 1. Okamoto uses a *single spot* to scan the sample using galvanometers rotating in perpendicular directions. *Id.*, ¶18. Okamoto uses a “CCD 24 [] provided at a position that is conjugate or nearly conjugate to the pinhole of the pinhole plate PH of the confocal optical system” to image the sample. *Id.*, ¶30. Okamoto relies on a controlled-stage environment for its operation. *Id.*, ¶¶39, 40.



EX1003, Fig. 1 (annotated).

3Shape's combination of Babayoff, Okamoto, and Xu is premised on the incorporation of the color scanning system taught by Okamoto into Babayoff's intraoral scanner. Pet., 70-71. Okamoto teaches a specific configuration of optical components for its color scanning system, and there is no explanation by 3Shape with respect to how a POSA would have integrated the color scanning system as taught by Okamoto into Babayoff's hand-held intraoral scanner. For example, 3Shape does not explain which components would be shared between the two systems, which components would need to be replaced, whether components

would need to be removed, how a POSA would reconfigure the lenses and mirrors to account for the characteristics of these distinct optical systems (e.g., with respect to aberration, polarization, alignment, max intensity, field of view, etc.), or how to employ the two different detectors in a combined system. The petition does not explain how Okamoto's *single-spot* scanning system would be adapted for use in Babayoff's *arrayed* illumination system. Nor does the petition show how a POSA would go about successfully miniaturizing all of the elements of the color scanning system taught by Okamoto (e.g., white light source 20, second collimating lens 21, first half mirror 22, second half mirror 23, and color CCD 24). As a result, the petition fails to set forth the requisite "clear, evidence-supported account of the contemplated workings of the combination." *Personal Web*, 848 F.3d at 994.

Having two optical systems, as Okamoto teaches, also creates problems with respect to miniaturizing all the elements to fit the constraints of Babayoff. 3Shape does not dispute that miniaturization would be necessary. Pet., 72-73. Rather, Dr. Dianat asserts that dealing with these numerous, multi-faceted technical problems would not have been "unsolvable" for a POSA. EX1024, ¶206. But the length and circuitry of Dr. Dianat's explanations only reinforce that the modifications are far more significant than 3Shape suggests. Pet., 70 (asserting that Okamoto's color scanning system and processor "could be readily deployed in Babayoff's probe"). For example, miniaturizing all the elements of the two optical systems taught by

Okamoto to fit within the constraints of Babayoff's hand-held scanner would require a POSA to address technical problems including aberration errors (e.g., chromatic aberration, spherical aberration, coma, astigmatism, field curvature, distortion), focusing errors, scattering errors, and changes in light transmission.

3Shape does not deny that challenges would arise when attempting to incorporate Okamoto's CCD 24 into the monochromatic, hand-held intraoral scanner of Babayoff which employs CCD 68. Misalignment of the CCDs due to differences in magnification, orientation, and rotation would result in inaccurate color imaging of an object. 3Shape also does not deny that misalignment issues would occur due to differences in magnification, orientation, and rotation. Rather, Dr. Dianat summarily asserts that this would not be a problem "because the '538 Patent expressly discloses an optical system employing two such CCDs" and these problems "could have been easily corrected by a POSITA." EX1024, ¶¶208-209.

In alleging that the color scanning system taught by Okamoto could be deployed in Babayoff's hand-held monochromatic intraoral scanner, 3Shape and Dr. Dianat again rely on numerous extraneous references. Pet., 71-72; EX1024, ¶¶195-209. Again they fail to explain the relationship between these extraneous references and the asserted art, either with respect to how the teachings apply or why a POSA would have looked to them. The degree to which 3Shape resorts to these sources underscores that the combination is riddled with technical challenges.

c. The combination is the result of hindsight bias.

3Shape and Dr. Dianat also improperly rely on the '538 patent as support for why a POSA would have had a reasonable expectation of success in combining Babayoff and Okamoto. Pet., 72 (asserting that “the '538 Patent does not discuss, let alone resolve, these purported problems”); EX1024, ¶202 (“I note that these references purportedly present technical issues that the challenged patents do not themselves discuss or resolve.”). 3Shape and Dr. Dianat have therefore *admittedly* relied on the “inventor’s own path” to allege obviousness, which the law prohibits. *Millennium Pharm., Inc. v. Sandoz Inc.*, 862 F.3d 1356, 1367 (Fed. Cir. 2017).

Independent of 3Shape’s and Dr. Dianat’s improper reliance on the '538 patent in their obviousness analysis, the combination itself “manifests hindsight reasoning” because it is “neither suggested by the prior art, nor supported by the background knowledge possessed by a person having ordinary skill in the art.” *Intel Corp. v. Hera Wireless S.A.*, IPR2018-01686, Paper 8 at 19 (P.T.A.B. Apr. 11, 2019) (citing *W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1553 (Fed. Cir. 1983)). Here, it is apparent that 3Shape and Dr. Dianat have improperly utilized the “invention as a roadmap to find its prior art components.” *Princeton Biochemicals, Inc. v. Beckman Coulter, Inc.*, 411 F.3d 1332, 1337 (Fed. Cir. 2005).

This is consistent with the findings of the ALJ in *In the Matter of Certain Color Intraoral Scanners and Related Hardware and Software*, Inv. No. 337-TA-

1091, which involved similar arguments against a related patent (U.S. Patent No. 8,363,228). There, the ALJ held that 3Shape’s “case for obviousness based on [Babayoff] and [Okamoto] appears to be based on hindsight.” EX2001, at 96.³

While 3Shape attempts to use the history of litigation between the parties to fill gaps in its obviousness case, the problem is not with the degree of explanation required but rather with how far afield these references are from one another.

3. Dr. Dianat admitted that he lacks expertise in the relevant technology and his opinions should be given no weight.

3Shape’s petition does not demonstrate a reasonable likelihood of prevailing because it relies on the testimony of Dr. Dianat. EX1024. Dr. Dianat has offered testimony in other proceedings involving related patents. IPR2019-00157 (U.S. Patent No. 8,363,228); IPR2019-00159 (U.S. Patent No. 8,451,456); IPR2019-00160 (U.S. Patent No. 8,675,207); IPR2019-00163 (U.S. Patent No. 9,101,433). In these related proceedings, Dr. Dianat has offered testimony about Babayoff and Okamoto with respect to claim language that is similar to that of the ’538 patent.

³ EX2001, U.S. ITC Investigation No. 337-TA-1091, Initial Determination, at 96 (referring to Babayoff as “Babayoff WIPO” and referring to Okamoto as “Yoichi,” *see id.*, 86) (subsequently affirmed in relevant part by the Commission (EX2002, Investigation No. 337-TA-1091, Commission Review Decision)).

Dr. Dianat was cross-examined on that testimony. That cross-examination revealed that Dr. Dianat lacks a sufficient understanding of the technology at issue and his opinions should be given no weight. Specifically, Dr. Dianat admitted that he has never worked with or used a confocal microscope. EX2004, 58:13-16 (“Q Okay. During the course of your experience and work, have you worked with confocal microscopes? A No. Directly, no.”), 69:18-20 (“Q Have you personally worked with an optical confocal microscope? A I personally, no.”). Dr. Dianat was not aware of the physical size of confocal microscopes like that of Okamoto. *Id.*, 69:8-17. Dr. Dianat was unable to answer several basic questions about optical systems and the impact of modifying an optical system generally. *Id.*, 60:22-61:11, 121:5-124:11, 138:20-139:10, 144:19-145:3, 148:8-16. Dr. Dianat was unable to answer basic questions about the impact of modifying Okamoto’s optical system for incorporation into Babayoff’s system. *Id.*, 121:5-124:11, 194:14-195:14.

Consistent with Dr. Dianat’s lack of familiarity with the optical systems and microscopes discussed in his declarations, he testified that his expertise is actually in the field of image processing. *Id.*, 44:18-45:19. Dr. Dianat was able to cite only one instance in which he helped design something in the optical space. *Id.*, 47:5-48:6, 50:6-20, 51:7-12, 59:4-9. In that instance, it was a sensor for a light source in a printer during his work with Xerox. *Id.* It did not involve the design of lenses, beam splitters, or polarizers (optical components in Babayoff and Okamoto). *Id.*

3Shape effectively admitted in these related proceedings that Dr. Dianat’s qualifications were deficient by abandoning him as a declarant for their petitioner replies. In those related proceedings, 3Shape put forth reply testimony from a new declarant, Dr. Schaafsma, who raised new arguments based on new evidence. Dr. Schaafsma later admitted on cross-examination, however, that he failed to consider the findings of the ALJ in Inv. No. 337-TA-1091 discussed above—that 3Shape’s asserted obviousness grounds based on Babayoff and Okamoto were the result of impermissible hindsight. EX2005, 43:2-20. 3Shape’s advancement of one set of opinions for purposes of institution and another set of opinions during trial in these related proceedings undermines its challenge here and Dr. Dianat’s credibility.

B. The Board should exercise its discretion and deny institution because the petition is deficient, misleading, and tactical.

The Director has broad discretion to deny a petition. 35 U.S.C. § 314(a) (stating “[t]he Director may not authorize an inter partes review to be instituted unless . . .”); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2140 (“[T]he agency’s decision to deny a petition is a matter committed to the Patent Office’s discretion.”). This discretion is informed by 35 U.S.C. § 316(b), which requires the Office to “consider the effect of any such regulation on the economy, the integrity of the patent system, the efficient administration of the Office, and the ability of the Office to timely complete proceedings instituted under this chapter.” In its precedential decision, *General Plastic Co., Ltd. v. Canon Kabushiki Kaisha*, the

Board “recognize[d] the potential for abuse of the review process by repeated attacks on patents.” IPR2016-01357, Paper 19 at 16–17 (P.T.A.B. Sept. 6, 2017) (precedential). Here, there are multiple reasons why the Board should exercise its discretion to deny institution, in addition to those reasons addressed in Paper 9.

1. 3Shape’s petition fails to identify how the challenged claims are to be construed with respect to three terms.

A petition must “[p]rovide a statement of the precise relief requested for each claim challenged,” which “statement must identify . . . [h]ow the challenged claim *is to be construed*.” 37 C.F.R. § 42.104(b)(3) (emphasis added). In *Hologic, Inc., v. Enzo Life Sciences, Inc.*, IPR2018-00019, Paper 17 (P.T.A.B. Apr. 18, 2018), the Board articulated the basic principle that, “[a]t the Patent Trial and Appeal Board, petitioners should bring petitions for inter partes review asserting unpatentability based on constructions *that their petitions seek*.” *Id.* at 9 (emphasis added). Here, 3Shape’s petition does not identify how the challenged claims are to be construed with respect to three terms: (1) “imaging means” (Pet., 12-13); (2) “wherein the device is configured for maintaining a spatial disposition with respect to the portion that is substantially fixed during operation of the optical scanner and the imaging means” (*id.*, 14); and (3) “confocal imaging techniques” (*id.*, 15).

Rather than indicate how the challenged claims are to be construed with respect to these terms, 3Shape’s petition identifies three *potential* constructions: the construction Align proposed in the ITC investigation; the construction 3Shape

proposed in the ITC investigation; and the ALJ's construction. The petition fails to identify which of the three, if any, 3Shape submits is the correct construction. This ambiguity violates 37 C.F.R. § 104(b)(3), in particular because it forces Align and the Board to guess which construction—if any—3Shape seeks for these terms.

By contrast, 3Shape's petition *does* identify how the challenged claims are to be construed with respect to “optical scanner.” *Id.*, 10. There, 3Shape proposes a construction under 35 U.S.C. § 112, ¶6, stating: “Petitioners advocated for this construction in the ITC investigation *and believe this is the correct construction here.*” *Id.* (emphasis added). The petition provides no such statement for the three terms listed above, rendering the petition's stance unclear as to those terms.

This lack of clarity runs afoul of the policy that the petition should address “unpatentability based on constructions that their petitions seek.” *Hologic, Inc., v. Enzo Life Sciences, Inc.*, IPR2018-00019, Paper 17 at 9 (P.T.A.B. April 18, 2018). Taking a position on claim construction in the petition is a necessary predicate to satisfying that policy and the text of Rule 104(b)(3). Because the petition fails to identify how the challenged claims *are to be construed*, it should be denied.

2. The petition fails to address a necessary *Graham* factor under the construction 3Shape advanced before the ITC.

Assuming the Board finds 3Shape's claim construction section compliant with Rule 104(b)(3), 3Shape has still failed to put forth a legally sufficient case of obviousness under the construction it advanced at the ITC with respect to the term

“wherein the device is configured for maintaining a spatial disposition with respect to the portion that is substantially fixed during operation of the optical scanner and the imaging means.” This is because 3Shape’s petition does not identify what is missing from Okamoto under the construction it advanced before the ITC. Pet., 39.

A petitioner bears the burden of proof to establish that it is entitled to the requested relief. 37 C.F.R. § 42.20(c). Differences between the claimed invention and the prior art are a critically important underlying inquiry for any obviousness analysis. *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17 (1966). “A petitioner who does not state the differences between a challenged claim and the prior art, and relies instead on the Patent Owner and the Board to determine those differences based on the rest of the submission in the petition risks having the corresponding ground of obviousness not included for trial for failing to adequately state a claim for relief.” *Liberty Mutual Insurance Co. v. Progressive Casualty Insurance Co.*, CBM2012-00003, Paper 7 at 2-3 (P.T.A.B. Oct. 25, 2012).

Where 3Shape’s petition addresses “[d]ifferences between the claimed invention and the prior art” (Pet., 39), the petition does not apply the construction 3Shape advanced before the ITC with respect to “wherein the device is configured for maintaining a spatial disposition with respect to the portion that is substantially fixed during operation of the optical scanner and the imaging means.” *See also* Pet., 35-36. Rather, the petition addresses only Align’s and the ALJ’s construction,

stating: “Okamoto does not expressly disclose that the ‘operation by the optical scanner and the imaging means is at least substantially or effectively simultaneous such that movement (i.e., a change in spatial disposition) can be ignored’ as that feature of element [1.3] is construed by the Patent Owner and the ALJ” *Id.*

As a result of 3Shape’s failure to address this *Graham* factor (i.e., what is missing from Okamoto that Xu is being relied upon to cure) with respect to the construction it advanced before the ITC, the petition does not set forth a proper obviousness analysis under that construction. *Graham*, 383 U.S. 1, 17; *Liberty Mutual Insurance Co. v. Progressive Casualty Insurance Co.*, CBM2012-00003, Paper 7 at 2-3 (P.T.A.B. Oct. 25, 2012). This is in all likelihood because 3Shape has taken the position in the ITC investigation that Okamoto alone renders the ’583 patent invalid. EX2006, 0129. But 3Shape cannot have it both ways and comply with the Board’s requirement in *Hologic* that a petitioner “advocate unpatentability under a claim construction it considered to be correct.” *Hologic, Inc., v. Enzo Life Sciences, Inc.*, IPR2018-00019, Paper 17 at 9 (P.T.A.B. Apr. 18, 2018). Thus, to the extent the Board deems 3Shape’s reproduction of the position it took before the ITC to be the “claim construction it considered to be correct,” 3Shape has failed to put forth a legally sufficient case of obviousness under that construction. *Id.* As a result, 3Shape’s petition is like the petition in *Hologic* and should be denied.

3. Two out of the three references were cited during original prosecution, a fact that 3Shape's petition entirely omits.

Section 325(d) gives the Board discretion to deny a petition when “the same or substantially the same prior art or arguments previously were presented to the Office.” 35 U.S.C. § 325(d). In making this assessment, the Board applies the factors set forth in *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 at 17–18 (PTAB Dec. 15, 2017) (precedential as to § III.C.5, first paragraph) (“the *Becton Dickinson* factors”). *Becton Dickinson* factors (a) and (b) relate to whether the Examiner considered the prior art asserted in the petition.

Here, the petition falsely asserts that “[n]one of the references asserted in Grounds 1-2 were considered during prosecution of the ’538 Patent, let alone applied in a rejection.” Pet., 75. This is incorrect. Okamoto and Babayoff were cited in an Information Disclosure Statement (IDS) and marked as considered by the Examiner. EX1002, 92, 164, 198 (initialing Babayoff and Okamoto, listed one next to the other, as considered). Both references appear on the face of the ’538 patent and are therefore presumed to have been considered by the Examiner. 37 C.F.R. §§ 1.97, 1.98; M.P.E.P. § 609. Babayoff is even cited and discussed in the background section of the specification. EX1001, 1:40-42.⁴ There can be no doubt

⁴ The Examiner who examined the application resulting in the ’538 patent also examined the application resulting in U.S. Patent No. 7,724,378. During

that the Examiner was aware of Babayoff and Okamoto. It is reasonable to infer that the Examiner did not apply one or both because such a rejection would not have been legally or factually sound, at least for all the reasons discussed above.

Whatever weight the Board is inclined to give the Examiner's consideration of references cited in an IDS and discussed in the background section of the patent, 3Shape's petition omits to mention these facts. As a result, 3Shape's arguments seeking to avoid discretionary denial under 35 U.S.C. § 325(d) are misleading.

While Xu was not cited or applied during prosecution, "merely adding additional references to prior art previously presented to the Office may implicate § 325(d) in some cases." *Comcast Cable Communications, LLC, v. Rovi Guides, Inc.*, IPR2019-01434, Paper 14 at 15 (P.T.A.B. Feb. 12, 2020). That is the case here because Xu, a lithography microscope, is non-analogous art to the '538 patent and was understandably not identified by the Examiner. *See supra* Section II.A.1.a.

4. The ITC has conducted a trial on the '538 patent and will soon make a determination based on the same references.

The '538 patent is the subject of a nearly-completed investigation before the ITC in which 3Shape is a respondent and an initial determination by the ALJ is expected by April 17, 2020. EX2007, Inv. No. 337-TA-1144 (Notice from ALJ

prosecution of the '378 patent, the applicant filed a single-reference IDS citing Okamoto. EX2009. The Examiner initialed Okamoto as considered. *Id.*, 1.

Regarding Expected Target Date) at 1. In that investigation, 3Shape has alleged unpatentability based on, among other references, Babayoff, Okamoto, and Xu.

Before the ITC, 3Shape already attempted to prove invalidity based on Okamoto, Xu, and Babyoff. In its petition, 3Shape advances essentially the same theories of unpatentability after receiving the benefit of previewing all of Align's rebuttal arguments and its expert's testimony. By strategically waiting until this late stage to file its petition, 3Shape has obtained an unfair tactical advantage. A decision in the ITC investigation is expected *within one month of this filing* and thus well before the Board is required to determine whether to institute trial.

When deciding whether to institute, the Board should consider "events in other proceedings related to the same patent," whether the proceedings are those "at the Office, in district courts, *or the ITC*." Trial Practice Guide Update at 10 (Aug. 13, 2018) (emphasis added). Here, the ITC has already conducted a six-day evidential hearing, during which it heard arguments and testimony on 3Shape's invalidity contentions based on Babyoff, Okamoto, and Xu. EX2006, 0129-0152. Briefing in the ITC action is complete and the parties are just awaiting a decision.

The related ITC investigation is at a very advanced stage and has significant overlap in terms of the asserted art, evidence, and claim language at issue. Where there is such overlap with a co-pending validity challenge before a district court, the Board has exercised its discretion under 35 U.S.C. § 314(a) to deny institution.

See, e.g., NHK Spring Co. Ltd. v. Intri-Plex Tech., Inc., IPR2018-00752, Paper 8 (P.T.A.B. Sept. 12, 2018) (precedential) (denying institution where prior art was previously considered in related district court action that was nearing completion). The Board has extended the logic of *NHK* to petitions filed at a late stage of an ITC investigation. *Bio-Rad Laboratories, Inc. v. 10X Genomics, Inc.*, IPR2019-00567, Paper 23 at 28 (P.T.A.B. Aug. 8, 2019) (denying institution where the same prior art was previously considered in related ITC action that was nearing completion).

While the ITC itself lacks authority to invalidate a patent, once the ITC’s decision is affirmed by the Federal Circuit, an ITC invalidity determination can carry dispositive weight. *See Texas Instruments, Inc. v. Cypress Semiconductor Corp.*, 90 F.3d 1558, 1569 (Fed. Cir. 1996) (explaining that “courts are not free to ignore holdings of th[at] court that bear on cases before them,” nor may subsequent Federal Circuit panels “deviate from [a prior holding], short of thoroughly justified grounds.” *Id.* For all practical purposes, the Federal Circuit’s affirmance of an ITC decision on invalidity—which will inevitably issue prior to any Federal Circuit decision based on this petition—will have the same effect as an affirmance of the Board’s decision. 3Shape has all but conceded as much in the related district court action, where it moved for—and obtained—a stay pending review by the ITC by arguing that the ITC’s investigation “will narrow and simplify the issues” before the court “[d]ue to the significant interconnection of the patents at issue in this

action and ITC Inv. No. 337-TA-1144.” EX2008, 4 (*Align Technology, Inc. v. 3Shape A/S et al.*, No. 1:18-cv-01950 (D. Del.), ECF No. 15 (Mar. 8, 2019)).

Not only does equity weigh in favor of denying institution, but it would save significant resources for the Board at a time when many things are uncertain. Paper 9. For this reason, the Board should exercise its discretion and deny institution.

C. 3Shape has not justified multiple petitions against the ’538 patent.

The ’538 patent contains 21 claims. 3Shape filed a parallel petition against claims 1 and 2. 3Shape has not adequately explained why two petitions are needed or why 3Shape could not have raised all grounds in one petition. Neither petition demonstrates a reasonable likelihood of prevailing and both should be denied.

Two *General Plastic* factors are particularly applicable here: (a) there are multiple petitions directed to the same claims that were filed by the same petitioner (factor 1); and (b) institution would not preserve the finite resources of the Board (factor 6). *General Plastic*, IPR2016-01357, Paper 19 at 16. The Board has refused to institute review when a party has filed multiple, parallel petitions and has not met its burden to distinguish the petitions or explain why it is entitled to multiple trials. *See, e.g., LG Elecs., Inc. v. ATI Techs. ULC*, IPR2015-00327, Paper 13 at 8-12 (P.T.A.B. July 10, 2015) (denying institution of a concurrently filed petition).

The facts here are comparable to those in *LG Electronics*. Here, 3Shape has concurrently filed two petitions against the ’538 patent. This places the significant

and unfair burden on Align to respond to, and the Board to adjudicate, two related challenges. *Comcast Cable Commc'n., LLC, v. Rovi Guides, Inc.*, IPR2019-00224 et al., Paper 10 at 2-3 (P.T.A.B. Apr. 3, 2019) (finding that “when there are other related patents also each challenged by multiple petitions at the same time, ... this can undermine the Office’s ability to complete proceedings in a timely manner”).

3Shape has also failed to distinguish its multiple petitions. The Board has held that it is incumbent upon the petitioner to distinguish both “horizontally” and “vertically” redundant alternative grounds. *Liberty Mutual Ins. Co. v. Progressive Cas. Ins. Co.*, CBM2012-00003, Paper 7 at 3, 12 (P.T.A.B. Oct. 25, 2012). Where multiple petitions are filed, each petition must explain “why [one reference] is more preferred for satisfying some elements, while [another reference] is more preferred for satisfying some other elements.” *Oracle Corp. v. Clouding IP, LLC*, IPR2013-00088, Paper 13 at 3 (P.T.A.B. June 13, 2013). Without the required explanation, redundant grounds are “not all entitled to consideration” because they are “contrary to the regulatory and statutory mandates” for “just, speedy, and inexpensive” resolution. *Liberty Mutual Ins. Co.*, CBM2012-00003, Paper 7 at 2.

The Board has routinely held that merely pointing out differences between references is insufficient for institution of redundant grounds. *Id.*; *ScentAir Techs., Inc. v. Prolitec, Inc.*, IPR2013-00179, Paper 18 at 3 (P.T.A.B. Aug. 23, 2013) (“To avoid a determination that a requested ground of review is redundant of another

requested ground, a petitioner must articulate a meaningful distinction in terms of relative strengths and weaknesses with respect to application of the prior art reference disclosures to one or more claim limitations.”). Here, 3Shape notes that its two petitions against the ’538 patent present different art, and therefore are not cumulative. But the mere fact that petitions are not entirely cumulative does not mean that the petitions are not redundant. Nor does this justify two trials on the same patent based on two petitions (and therefore double the word count). 3Shape has not explained why it could not have presented all grounds in a single petition.

For these reasons, the Board should exercise its discretion and decline to institute review of the ’538 patent entirely. But if the Board is inclined to institute review of the ’538 patent, then it should use its discretion to deny at least one of the petitions as an unnecessary waste of the Office’s and the parties’ resources.

III. RELIEF REQUESTED

For the foregoing reasons, the Board should deny institution.

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**CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME LIMITATION,
TYPEFACE REQUIREMENTS, AND TYPE STYLE REQUIREMENTS**

1. This Patent Owner's Preliminary Response complies with the type-volume limitation of 14,000 words, comprising 8,330 words, excluding the parts exempted by 37 C.F.R. § 42.24(a)(1).

2. This Patent Owner's Preliminary Response complies with the general format requirements of 37 C.F.R. § 42.6(a) and has been prepared using Microsoft® Word 2010 in 14 point Times New Roman.

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that on March 17, 2020, the foregoing
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