

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

COSTA DEL MAR, INC.,
Petitioner,

v.

HOPNIC LABORATORY CO., LTD.,
Patent Owner.

IPR2021-00838
Patent 7,506,977 B1

Before KEVIN F. TURNER, NEIL T. POWELL, and
STEVEN M. AMUNDSON, *Administrative Patent Judges*.

TURNER, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. *Background*

Costa del Mar, Inc. (“Petitioner”) filed a Petition (Paper 2, “Pet.”) requesting institution of *inter partes* review of claims 1–23 of U.S. Patent No. 7,506,977 B1 (Ex. 1001, “the ’977 Patent”). Hopnic Laboratory Co., Ltd. (“Patent Owner”) filed a Preliminary Response (Paper 8, “Prelim. Resp.”).

An *inter partes* review may be instituted only if “the information presented in the petition . . . and any [preliminary] response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a) (2018). For the reasons given below, Petitioner has established a reasonable likelihood that it would prevail in showing the unpatentability of at least one of the challenged claims of the ’977 Patent. Accordingly, we institute an *inter partes* review of claims 1–23 of the ’977 Patent on the grounds of unpatentability raised in the Petition.

B. *Related Proceedings*

Neither party identifies any judicial or administrative matter that would affect, or be affected by, a decision in this proceeding. Pet. 1; Paper 6, 1.

C. *The ’977 Patent*

The ’977 Patent is directed to the field of “a plastic spectacles lens containing an organic dye instead of a neodymium compound having optical absorbing performance.” Ex. 1001, 1:6–11. The ’977 Patent acknowledges that the field generally used a neodymium compound to “shade dazzling wavelength rays,” where “[i]n practice, a spectacles lens containing a

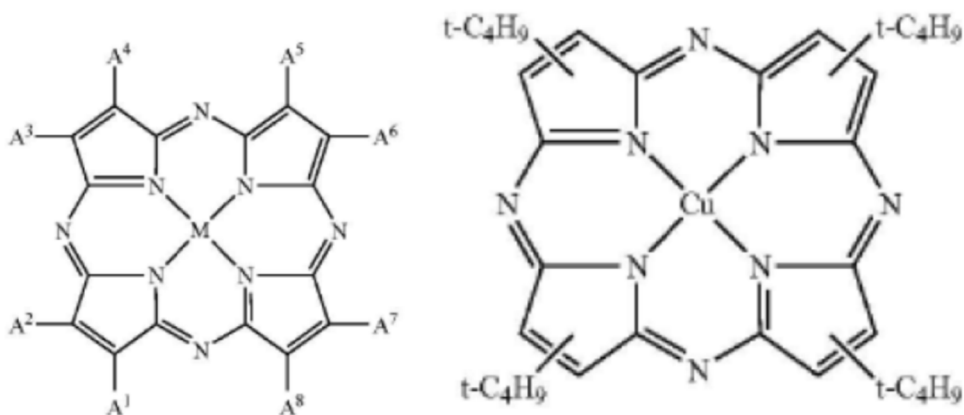
neodymium compound which can highly selectively absorb visible rays near a wavelength of 585 nm is used.” *Id.* at 1:13–21. Patent Owner stipulates that:

Dazzle is the glare that causes the feeling that one experiences “when he rapidly enters a light place from a dark place or, to the contrary, nothing is visible for a time when he enters a light place from a dark place. Further, the above phenomenon is also the reason why he feels very dazzled under strong sunlight such as outdoors in the daytime during fine weather, at the seashore or mountains in summer.”

Prelim. Resp. 3 n.1 (quoting Ex. 2005, 1:23–29). The ’977 Patent further provides that “incorporating an organic rare earth metal complex into a plastic lens material leaves many problems to be solved,” and that the use of a common organic rare earth metal complex in such lenses occurs “only with difficulty due to poor solubility and dispersibility in the resin, undesirable reactivity with the lens resin, and poor storage stability under ordinary conditions.” Ex. 1001, 1:54–64.

The ’977 Patent addressed these issues by incorporating an organic dye with specific spectral characteristics into a plastic lens wafer, or into a layer that is formed on one side of the lens wafer. Ex. 1001, 3:44–54. The ’977 Patent identified a specific tetraazaporphyrin compound that exhibited a sharp absorption peak at 585 nm, similar to that of neodymium. *Id.* at 6:26–32.

The ’977 Patent also discloses a generic structure and a species with Cu inserted into the M location as being its specific tetraazaporphyrin compound:



where the species is identified as being “available as ‘PD-311S’ manufactured by Mitsui Chemicals, Inc.” Ex. 1001, 17:1–56.

D. Challenged Claims

Claim 1 is the sole independent claim challenged in this proceeding, with each of challenged claims 2–23 dependent thereon, directly or indirectly, and is reproduced below:

1. [preamble] A plastic spectacle lens comprising [a] a plastic lens wafer formed from a thermosetting or thermoplastic resin or the plastic lens wafer and one, or two or more component layers formed on at least one side of the plastic lens wafer [b] either the plastic lens wafer or at least one of the component layers comprising an organic dye which exhibits a sharp absorption satisfying the following conditions (A), [c] whereby the plastic spectacles lens need not substantially contain a rare earth metal: and the conditions (A) are made up as follows:

[b(i)] the visible ray absorption spectrum measured in a chloroform or toluene solution of the organic dye has a [b(ii)] main absorption peak (P) between 565 nm and 605 nm [b(iii)] the coefficient of absorption index (ml/g·cm) of the apex (P_{max}: a point at which the coefficient of absorption is maximum) is 0.5x10⁵ or more [b(iv)] the peak width at ¼ of the absorption at the apex (P_{max}) of the peak (P) is 50 nm or less [b(v)] the peak width at ½ of the absorption at the apex (P_{max}) of the peak (P) is 30 nm or less, and [b(vi)] the peak width at ⅔ of the absorption at the apex (P_{max}) of the peak (P) is 20 nm or less.

Ex. 1001, 27:6–25 (with annotations provided by Petitioner, Pet. 17–18).

E. Asserted Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability (Pet. 17–65), supported by the declaration of Peter C. Wade, Ph.D. (Ex. 1003):

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–10, 13–19	103(a) ¹	Noda, ² Ozawa, ³ Maslyukov ⁴
11, 12, 20–22	103(a)	Noda, Ozawa, Maslyukov, Kanemura ⁵
23	103(a)	Noda, Ozawa, Maslyukov, Colton ⁶

II. ANALYSIS

A. Level of Ordinary Skill in the Art

Petitioner, supported by Dr. Wade’s testimony, proposes that a person of ordinary skill in the art at the time of the invention would have had “at least a bachelor’s degree in Chemistry, Organic Chemistry, Chemical

¹ The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 285–88 (2011), revised 35 U.S.C. § 103 effective March 16, 2013. Because the challenged patent claims priority to an application filed before March 16, 2013, we refer to the pre-AIA version of § 103.

² Japanese Unexamined Patent Application Publication No. 2005-23999, published September 8, 2005 (Ex. 1005, “Noda”) (Certified English translation provided as part of exhibit).

³ Japanese Unexamined Patent Application Publication No. 2003-36033, published February 7, 2003 (Ex. 1006, “Ozawa”) (Certified English translation provided as part of exhibit).

⁴ Soviet Patent No. 765281, published September 23, 1980 (Ex. 1007, “Maslyukov”) (Certified English translation provided as part of exhibit).

⁵ U.S. Patent No. 5,191,055, issued March 2, 1993 (Ex. 1010, “Kanemura”).

⁶ European Patent Specification No. EP 1 144 486 B1, published November 3, 2004 (Ex. 1012, “Colton”).

Engineering, or an equivalent discipline, and at least three years of experience working with organic dyes in light-filtering applications.” Pet. 8 (citing Ex. 1003 ¶ 22). Patent Owner argues that the Petition should be denied under this level of skill in the art and reserves its right to challenge the same if this proceeding continues. Prelim. Resp. 8.

At this stage of the proceeding, we find Petitioner’s proposal consistent with the level of ordinary skill in the art reflected by the prior art of record, *see Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995); *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978), and, therefore, we adopt Petitioner’s unopposed position as to the level of ordinary skill in the art for purposes of this decision.

B. Claim Construction

In this *inter partes* review, claims are construed using the same claim construction standard that would be used to construe the claims in a civil action under 35 U.S.C. § 282(b). *See* 37 C.F.R. § 42.100(b) (2020). The claim construction standard includes construing claims in accordance with the ordinary and customary meaning of such claims as understood by one of ordinary skill in the art at the time of the invention. *See id.*; *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–14 (Fed. Cir. 2005) (en banc). In construing claims in accordance with their ordinary and customary meaning, we take into account the specification and prosecution history. *Phillips*, 415 F.3d at 1315–17.

Petitioner identifies two claim elements for which it puts forward explicit constructions. Pet. 8–12. Patent Owner argues that the Petition

should be denied under constructions proposed by Petitioner and reserves its right to challenge the same if this proceeding continues. Prelim. Resp. 8.

We consider each of Petitioner's proposed, explicit constructions below.

1. *“whereby the plastic spectacles lens need not substantially contain a rare earth metal”*

With respect to the limitation “whereby the plastic spectacles lens need not substantially contain a rare earth metal” of claim 1, Petitioner asserts that this phrase “means that a substantial amount of a rare earth metal is not needed to achieve the ‘sharp absorption satisfying the following conditions (A).’” Pet. 8. Petitioner further asserts that “because the plastic spectacles lens has an organic dye that achieves the desired optical properties, “the lens does not need to have a ‘rare earth metal’ in any substantial amount.” *Id.* at 9 (citing Ex. 1003 ¶ 36). Petitioner additionally asserts that this would have been the reasonable and normal understanding of persons of ordinary skill in the art in considering the claim limitation in the context of the specification. *Id.* at 10. As discussed above, Patent Owner does not traverse the constructions proffered by Petitioner at this stage of the proceeding. Prelim. Resp. 8.

At this stage of the proceeding, we find that Petitioner's proposed construction is supported by the '977 Patent specification, and adopt Petitioner's proposed meaning of “whereby the plastic spectacles lens need not substantially contain a rare earth metal” for purposes of institution. We further note that, given the construction of the claim limitation as a “negative limitation,” and the stipulation “need not,” it is unclear whether the claim would exclude plastic spectacle lenses with no rare earth metal or composed

of a large amount of rare earth metal. Given the disclosures of the references cited by Petitioner, we need not consider these alternative interpretations of the claim limitation.

2. “*the organic dye is previously incorporated in the plastic lens wafer*”

Claim 7 recites, in part, that “the organic dye is previously incorporated in the plastic lens wafer,” and Petitioner asserts that “incorporated” is not a technical term of art and cites to that term’s standard dictionary definition: “to unite with or introduce into something already existent usually so as to form an indistinguishable whole that cannot be restored to the previously separate elements without damage.” Pet. 10–11 (citing Ex. 1017; Ex. 1003 ¶ 40). Based on this, Petitioner asserts that claim 7 encompasses “any manner of uniting the organic dye with the plastic lens wafer such that they cannot easily be separated.” *Id.* at 11–12. As discussed above, Patent Owner does not traverse the constructions proffered by Petitioner at this stage of the proceeding. Prelim. Resp. 8.

At this stage of the proceeding, we find that Petitioner’s proposed construction is supported by the ’977 Patent specification, and adopt Petitioner’s proposed meaning of “the organic dye is previously incorporated in the plastic lens wafer” for purposes of institution.

We determine that it is not necessary to provide an express interpretation of any other claim terms. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017); *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.”).

C. Legal Standards – Obviousness

The U.S. Supreme Court sets forth the framework for applying the statutory language of 35 U.S.C. § 103 in *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17–18 (1966):

Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.

As explained by the Supreme Court in *KSR International Co. v. Teleflex Inc.*,

Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis should be made explicit.

550 U.S. 398, 418 (2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.”)).

“Whether an ordinarily skilled artisan would have been motivated to modify the teachings of a reference is a question of fact.” *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1327 (Fed. Cir. 2016) (citations omitted).

“[W]here a party argues a skilled artisan would have been motivated to

combine references, it must show the artisan ‘would have had a reasonable expectation of success from doing so.’” *Arctic Cat Inc. v. Bombardier Recreational Prods. Inc.*, 876 F.3d 1350, 1360–61 (Fed. Cir. 2017) (quoting *In re Cyclobenzaprine Hydrochloride Extended-Release Capsule Patent Litig.*, 676 F.3d 1063, 1068–69 (Fed. Cir. 2012)).

D. Obviousness over Noda, Ozawa, and Maslyukov

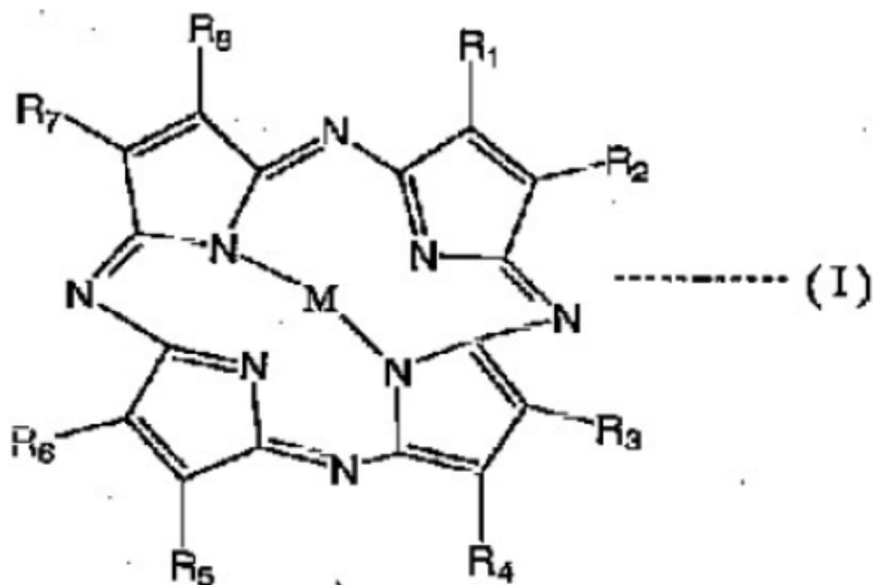
Petitioner asserts that the combination of Noda, Ozawa, and Maslyukov would have rendered the subject matter of claims 1–10 and 13–19 obvious to one of ordinary skill in the art at the time of the invention. Pet. 17–60. Patent Owner argues that the asserted prior art references fail to disclose all elements of claims 1 and 14, and that Petitioner has provided inadequate motivation for ordinarily skilled artisans to have combined the teachings of Noda, Ozawa, and Maslyukov as suggested by Petitioner. Prelim. Resp. 14–41. We begin with brief discussions of the cited references, and then consider Petitioner’s arguments with respect to the references’ teachings applied to the instant claims as well as Patent Owner’s arguments asserting deficiencies in this ground of unpatentability.

1. Noda

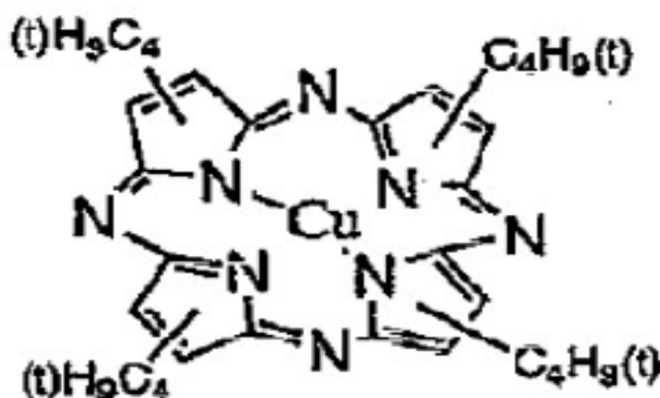
Noda discloses forming a thermoplastic or thermosetting resin layer with a tetraazaporphyrin dye on a plastic substrate for absorbing light, especially for reducing transmission of light of a specific wavelength. Ex. 1005 ¶¶ 1, 15, 70, 75. Noda further discloses that the resin composition may be used on “sunglasses, regular glasses, protective goggles, or contact lenses.” *Id.* ¶ 77. Noda teaches that an exemplary pigment is the cyanine pigments described in Ozawa, specifically “the tetraazaporphyrin pigment shown by the general formula (I).” *Id.* ¶ 15.

2. Ozawa

Ozawa is directed to filters for displays which provide excellent color adjustment filter having sharp absorption in the wavelength ranges of 480–520 nm and 550–610 nm. Ex. 1006 ¶¶ 1, 7. Ozawa describes light filters having multiple pigments including having a tetraazaporphyrin dye indicated by the following general formula:



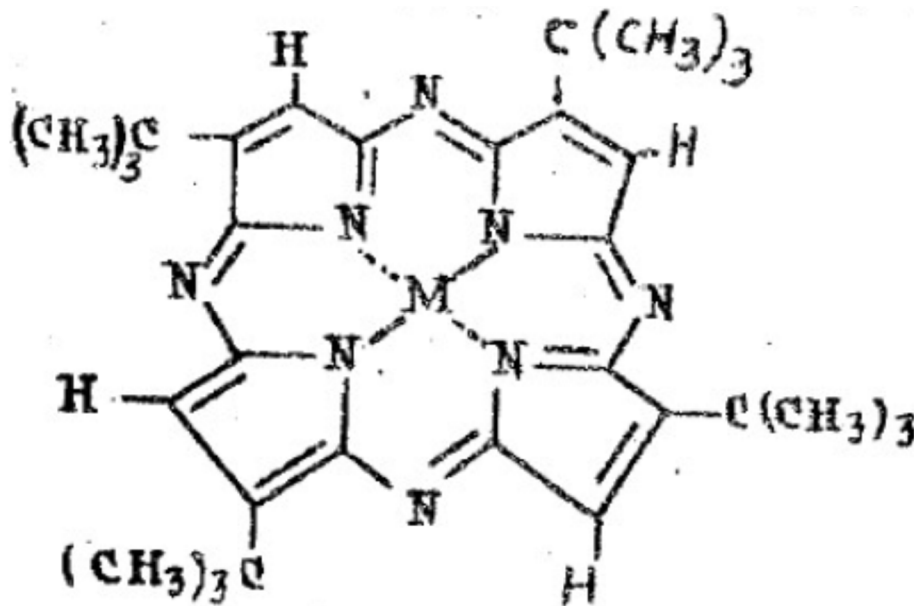
Chemical formula for tetraazaporphyrin dye disclosed in Ozawa Ex. 1006 ¶ 9. R₁ to R₈ independently represent multiple compounds and “M represents two hydrogens, a divalent metal atom, a trivalent monosubstituted metal atom, a tetravalent disubstituted metal atom, or an oxy-metal atom.”
Id. ¶ 10. Example I-2 of Ozawa has copper substituted for M and is reproduced below:



Chemical formula for Example I-2 disclosed in Ozawa
 Ex. 1006 ¶ 20.

3. Maslyukov

Maslyukov is directed to the field of polymeric light filters, based on inorganic substances and consisting of optically transparent polymers and light-filtering additives, which may be utilized in various optical devices. Ex. 1007, 1:21–26. Maslyukov discloses a polymer composition with absorption in the 560–620 nm region with the general formula of:



General chemical formula for a polymer disclosed in Ozawa

“where M is HH, Co, Cu, VO, Mg, Ni or Pd, in an amount of $5.7 \cdot 10^{-4}$ – $9.2 \cdot 10^{-2}$ % of the weight of the composition.” Ex. 1007, 3:6–14. Maslyukov expressly discloses the spectral properties of its copper-based and vanadium-based dyes as illustrated in Figures 1 and 2 of Maslyukov. *Id.* at 3:15–22, Figs. 1, 2.

4. *Claim 1*

a. *Preamble: A plastic spectacle lens*

With respect to the preamble of claim 1,⁷ Petitioner asserts that Noda discloses a resin compound used for forming a layer for absorbing light that may be used for “sunglasses, regular glasses, [or] protective goggles.” Pet. 18 (citing Ex. 1005 ¶¶ 1, 70, 77). Petitioner asserts that one of ordinary skill in the art would have understood that a thermoplastic layer formed on a transparent plastic substrate for sunglasses or other spectacles is a plastic spectacle lens, as recited in the preamble. *Id.* at 19.

Patent Owner does not raise any argument specifically addressing the preamble of claim 1 in the Preliminary Response. We find that at this stage of the proceeding, on the present record, Petitioner sufficiently establishes that Noda meets the limitations, if any, of the preamble of claim 1 for the reasons explained by Petitioner.

⁷ The parties do not express an explicit position on whether the preamble is limiting. Petitioner, however, addresses the preamble in its analysis of the claim, and stipulates its analysis with “[i]f the preamble is a claim limitation.” *See, e.g.*, Pet. 18. Although we express no determination on whether the preamble is limiting, for the reasons noted herein, we find that Petitioner sufficiently establishes that the preamble is met by Noda.

b. “plastic lens wafer”

With respect to the “plastic lens wafer” limitation of claim 1, Petitioner asserts that this limitation may be met by any one of the alternatives laid out in the claim, namely formed from a thermosetting resin, thermoplastic resin or a wafer and component layers formed on at least one side of the wafer. Pet. 19. Petitioner asserts that Noda discloses all three claimed alternatives, including its disclosure of a resin composition for forming a layer used to absorb light onto a transparent substrate, such as “a polyethylene terephthalate (PET) film.” *Id.* at 20 (citing Ex. 1005 ¶¶ 1, 3, 75, 77). Petitioner also asserts that Noda discloses other thermoplastic and thermosetting plastics as transparent substrates. *Id.* (citing Ex. 1005 ¶¶ 3, 74). Based on this disclosure, Petitioner asserts that persons of ordinary skill in the art would have understood that Noda discloses a plastic lens wafer formed from a thermoplastic resin or a thermosetting resin. *Id.* at 21–22.

Patent Owner argues the asserted references do not teach or suggest the “plastic lens wafer” limitation of claim 1. Prelim. Resp. 36. Patent Owner argues that Noda is directed toward an application in plasma display filters and the single mention in Noda of sunglasses, regular glasses, or protective goggles would be insufficient to suggest a *plastic* lens wafer, where other applications suggest the use of a glass or ceramic material. *Id.* at 37. Patent Owner also argues that Petitioner’s “selectively quoting out-of-context pieces of Noda,” i.e., portions detailing the use of a transparent substrate, do not teach that the transparent substrate can be a spectacles lens, where the substrate is entirely optional and not present in Noda’s claims. *Id.* at 37–38.

We do not agree with Patent Owner's arguments with respect to this limitation of claim 1. We look to Noda for all that it would have taught or suggested to one of ordinary skill in the art. That Noda's claims fail to recite the transparent substrate does not negate Noda's overall disclosure. Given that Noda discloses regular glasses, as pointed out by Petitioner, and that the '977 Patent acknowledges that "plastic lens material" was generally known (*see* Ex. 1001, 1:54–65), albeit with specific problems addressed therein, we are persuaded that it would have obvious to one of ordinary skill in the art that the recitations "sunglasses, regular glasses, protective goggles, or contact lenses" (Ex. 1005 ¶ 77), would have rendered uses of Noda's pigments to plastic lens wafers obvious.

We find that at this stage of the proceeding, on the present record, Petitioner sufficiently establishes that Noda meets this limitation of claim 1 for the reasons explained by Petitioner.

c. "organic dye exhibiting sharp absorption satisfying specified conditions (A)"

Claim 1 recites, in part, that "either the plastic lens wafer or at least one of the component layers comprising an organic dye which exhibits a sharp absorption satisfying the following conditions (A)." Petitioner asserts that the combination of Noda, Ozawa, and Maslyukov discloses or makes obvious this limitation. Pet. 22. Petitioner asserts that Noda expressly discloses several dyes including the tetraazaporphyrin pigment disclosed in Ozawa. Petitioner further asserts that Maslyukov also discloses a tetraazaporphyrin dye with the same structure as one of the isomers disclosed in Ozawa, and also discloses "additional details such as

concentration ranges of the dye in compositions and the spectral properties of those compositions.” *Id.* at 22–23.

Based on those disclosures, Petitioner asserts that a person of ordinary skill in the art would have been motivated to utilize variants of the tetraazaporphyrin dye disclosed in Ozawa in the plastic spectacles of Noda. Pet. 23. Alternatively and additionally, Petitioner asserts that a person of ordinary skill in the art would have been motivated to use any of the variants of the tetraazaporphyrin dye disclosed in Maslyukov because those variants are structurally the same as isomers of Ozawa’s dye variants and Maslyukov discloses additional details, such as concentration ranges and spectral properties, that would further motivate their use. *Id.* (citing Ex. 1003 ¶ 56). Petitioner also asserts that “[e]ach of the disclosed tetraazaporphyrin dye variants referenced by Noda and disclosed in detail by Ozawa and Maslyukov is an ‘organic dye’ as required by claim 1.” *Id.* at 25. Additionally, Petitioner asserts that given the spectral properties disclosed by Maslyukov, a person of ordinary skill in the art would have understood that the combination would have exhibited a sharp absorption with specific conditions. *Id.* at 25–33. At this stage of the proceeding, we are persuaded that the modifications put forward by Petitioner in the Petition are sufficient to meet this element of claim 1.

Patent Owner raises multiple arguments in asserting that the Petition fails to articulate the required reasoning with rational underpinning for why one of ordinary skill in the art would have made the choices and modifications proffered by the Petition. Prelim. Resp. 14. We address all of the Patent Owner’s arguments in turn, but we do not find them to be persuasive at this stage of the proceeding.

First, Patent Owner argues that a person of ordinary skill in the art would not have turned to Noda when seeking to solve the problems addressed by the '977 Patent. Prelim. Resp. 16–26. Patent Owner argues that Noda is directed to resins used for plasma displays, which are intended to absorb broad regions of the electromagnetic spectrum, which does not address the problems of shading dazzle asserted in the '977 Patent. *Id.* at 16–18. Patent Owner also argues that neither the Petition nor Dr. Wade's declaration "provides any citation or explanation" as to Noda being in the same field of endeavor as the '977 Patent. *Id.* at 18–22 (citing *Wang Labs., Inc. v. Toshiba Corp.*, 993 F.2d 858, 864 (Fed. Cir. 1993); *Airbus S.A.S. v. Firepass Corp.*, 941 F.3d 1374, 1380 (Fed. Cir. 2019); *Polygroup Ltd. MCO v. Willis Elec. Co.*, 759 F. App'x 934, 938 (Fed. Cir. 2019)). We do not agree with Patent Owner's arguments.

As discussed with respect to earlier elements of claim 1, Noda discloses its use in "sunglasses, regular glasses, protective goggles, or contact lenses." Ex. 1005 ¶ 77. As such, Noda is not directed solely to use with plasma displays, as argued by Patent Owner. Although Patent Owner emphasizes that Noda's broad absorption "is intended to serve important functions in plasma display screens by avoiding interference with remote control function due to near infrared rays and to facilitate color reproducibility" (Prelim. Resp. 21 (citing Ex. 1005 ¶¶ 2, 77)), Noda also specifies that its resin composition is used to "reduce[] transmission of light having a specific wavelength." Ex. 1005 ¶ 1. That particular use would have more relevance in the myriad of other applications specified by Noda, such as train or automobile windows, greenhouse glass, freezer or refrigerator showcase, or optical disks (Ex. 1005 ¶ 77), where interference

avoidance and color reproducibility would have less relevance. Given the disclosure of Noda, we are not persuaded that the field of endeavor of Noda is as narrow as Patent Owner asserts. Even if the fields of endeavor between Noda and the '977 Patent were different, Noda may be applicable to the claims of the '977 Patent if it is reasonably pertinent to the particular problem to be solved, acknowledged by Patent Owner and discussed below.

Patent Owner also argues that Noda is not reasonably pertinent to the particular problem solved by the '977 Patent. Prelim. Resp. 23–26. Patent Owner argues that “the specification of the '977 Patent describes a specific problem to be solved: ‘shad[ing] dazzling wave length rays as selectively as possible’ in spectacles lenses by ‘selectively absorb[ing] visible rays near a wavelength of 585 nm.’” *Id.* at 24 (quoting Ex. 1001, 1:17–20). Given that, Patent Owner argues that Noda “gives no suggestion that it could be used to solve the problem identified in the '977 Patent,” where the broad absorption of the pigment in Noda is neither selective nor sharp. *Id.* at 25. We do not agree with Patent Owner’s arguments.

“A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor’s endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor’s attention in considering his problem.” *In re Clay*, 966 F.2d 656, 659 (Fed. Cir. 1992). We are persuaded that Noda’s pigments, used to block specific wavelengths, would be reasonably pertinent to the issues addressed by the '977 Patent. Patent Owner takes issue with Petitioner’s definition of the problem to be solved, namely “modulating transmission properties of optical devices using organic dye compounds” (Prelim. Resp. 23 (quoting Pet. 13)), but we are not persuaded that such a definition is

overly broad. We take this view especially considering Noda's application to regular eyeglasses and other personal vision accompaniments, which fall squarely under the focus of the '977 Patent, namely plastic spectacles lenses.

Next, Patent Owner argues that Petitioner has failed to establish that a person of ordinary skill in the art would have modified the prior art, which discloses hundreds of dyes and combinations thereof, to arrive at the dye claimed in the '977 Patent. Prelim. Resp. 26–36. Patent Owner points out that Noda's citation to Ozawa occurs in a “list of dozens of options for pigments,” and cites classes of compounds encompassing hundreds of different compounds and Noda provides no rationale to select any particular compound. *Id.* at 27–29. Patent Owner also argues that Ozawa is directed to a combination of three pigments and numerous combinations, but the Petition presents a modification that uses only one pigment, which would have changed the principles under which Ozawa operates. *Id.* at 29–35. Lastly, Patent Owner argues that the Petition is espousing an obvious-to-try theory, advocating the selection of a single compound from a reference directed to at least 936 three-dye combinations. *Id.* at 35–36. We do not agree with Patent Owner's arguments at this stage of the proceeding.

First, we note that the plastic spectacles lens of claim 1 utilizes comprising language and is directed to “an organic dye which exhibits a sharp absorption satisfying the following conditions (A),” where the presence of additional dyes is not precluded. We do not take the Petition's discussion of a single dye from the combination of Noda, Ozawa, and Maslyukov as precluding the presence of additional dyes and/or layers; having an organic dye with the claimed characteristics is all that is necessary to render independent claim 1 obvious. Patent Owner has supplied no

argument or evidence that the extra dyes or layers would interfere with or negate the desired properties. Second, although Noda lists many options for pigments, Ozawa is specifically cited, and we are persuaded that this would have provided a strong rationale for one of ordinary skill in the art to seek out and examine the pigments disclosed in Ozawa. Lastly, Patent Owner is addressing Maslyukov as merely providing optical characteristics of a dye, as opposed to the other aspects of Maslyukov that would have narrowed the choices provided by Ozawa based on Maslyukov's specific and desirable characteristics. The Petition provides that:

because Maslyukov's tetraazaporphyrin dye variants are structurally the same as isomers of Ozawa's dye variants and Maslyukov discloses additional details, such as concentration ranges and spectral properties, that would further motivate and aid a POSITA in incorporating the dye variants into a specific useful composition.

Pet. 23 (citing Ex. 1003 ¶ 56). Dr. Wade also testifies that given the known drawback noted in the '977 Patent (Ex. 1001, 2:9–67), this drawback:

would have motivated a POSITA to search for an organic dye with a sharper absorption band to overcome those known shortcomings, and a POSITA would have understood, based on Maslyukov's disclosure of specific optical properties, that the dye variants of Ozawa and Maslyukov would achieve the desired sharper absorption band and resulting optical properties for plastic spectacles.

Ex. 1003 ¶ 56. As such, we agree with Petitioner that the disclosure of Maslyukov would have acted as a filter for the numerous compounds disclosed in Ozawa, and allowed for the selection of one of a series of compounds with the desired optical characteristics.

As such, we find that at this stage of the proceeding, on the present record, Petitioner sufficiently establishes that the combination of Noda,

Ozawa, and Maslyukov discloses or makes obvious this limitation of claim 1 for the reasons explained by Petitioner.

d. “measured in a chloroform or toluene solution”

With respect to “the visible ray absorption spectrum measured in a chloroform or toluene solution of the organic dye,” Petitioner asserts that a person of ordinary skill in the art would have understood that the claim recites the spectral properties of the organic dye when measured in a chloroform or toluene solution, not when incorporated into the plastic spectacles. Pet. 33. Petitioner also asserts that such a person would also have understood that this limitation does not require actual measurements so long as measurements of the spectral properties of the organic dye in a different material, along with other evidence, establish that an organic dye would meet the claimed spectral properties if measured in a chloroform or toluene solution. *Id.* (citing Ex. 1003 ¶ 69). Petitioner asserts that Maslyukov discloses the spectral properties of organic dyes measured in polymethylmethacrylate (“PMMA”), and that persons of ordinary skill in the art would have recognized that the type of solution or material in which a visible ray absorption spectrum of a dye is measured would not materially affect the spectral measurements of the dye, based on certain conditions, as disclosed in Reichardt (Ex. 1008). *Id.* at 34–35. Based on this, Petitioner asserts that the peak wavelength and bandwidth of the dye in Maslyukov would be expected to be substantially similar for chloroform, toluene, or methyl methacrylate (or its polymerized form, PMMA). *Id.* at 35 (citing Ex. 1003 ¶ 70).

In the Preliminary Response, Patent Owner does not raise any argument specifically addressing this limitation of claim 1 or Petitioner’s

analysis. Based on the evidence and testimony presented by Petitioner, we are persuaded that the spectral properties of the subject dyes would be substantially the same whether measured in chloroform or toluene solution or measured in PMMA. We find that at this stage of the proceeding, on the present record, Petitioner sufficiently establishes that the combination of Noda, Ozawa, and Maslyukov discloses or makes obvious this limitation of claim 1 for the reasons explained by Petitioner.

e. Optical properties or “specified conditions”

Claim 1 recites multiple specified conditions, referred to by Petitioner as elements [b(ii)] – [b(vi)], namely with the main absorption peak (P) between 565 nm and 605 nm, the coefficient of absorption index (ml/g·cm) of the apex (P_{max}: a point at which the coefficient of absorption is maximum) is 0.5×10^5 or more, the peak width at $\frac{1}{4}$ of the absorption at the apex (P_{max}) of the peak (P) is 50 nm or less, the peak width at $\frac{1}{2}$ of the absorption at the apex (P_{max}) of the peak (P) is 30 nm or less, and the peak width at $\frac{2}{3}$ of the absorption at the apex (P_{max}) of the peak (P) is 20 nm or less. With respect to these properties, Petitioner relies on the disclosures of Maslyukov and Ozawa, for the former’s disclosed optical properties of specific compounds, and Ozawa’s disclosure of a dye identical to PD-311S and its optical properties disclosed therein. Pet. 36–41 (citing Ex. 1007, 5, Figs. 1, 2; Ex. 1006 ¶ 7; Ex. 1003 ¶¶ 74–88; Ex. 1015). We find that at this stage of the proceeding, on the present record, Petitioner sufficiently establishes that the combination of Noda, Maslyukov, and Ozawa meets these limitations of claim 1 for the reasons explained by Petitioner. With respect to most of the specified conditions, Patent Owner does not raise any

argument specifically addressing these limitations of claim 1 in the Preliminary Response.

In addition, with respect to the “coefficient of absorption index,” Petitioner asserts that Maslyukov discloses that its tetraazaporphyrin dye has an “[e]xtinction coefficient” of 1.0×10^5 L/mol cm, and that a person of ordinary skill in the art would have understood that the “extinction coefficient” may be readily converted to the “coefficient of absorption index (ml/g cm) of the apex (Pmax: a point at which the coefficient of absorption is maximum),” per claim 1. Pet. 38.

Patent Owner acknowledges the relationship between an extinction coefficient and the coefficient of absorption index, but argues that the extinction coefficient as measured in Maslyukov was measured in PMMA, in contrast to claim 1 which requires that the spectral characteristics of the organic dye be measured in “chloroform or toluene.” Prelim. Resp. 39. Patent Owner further argues that Reichardt, discussed above with respect to the constancy of spectral characteristics from solvent to solvent, “actually suggests that the extinction coefficient *can* differ from solvent to solvent.” *Id.* at 40 (citing Ex. 1008, 2333).

With respect to Patent Owner’s argument, for purposes of institution, we are not persuaded. As determined by Dr. Wade, Maslyukov’s extinction coefficient of 1.0×10^5 L/mol cm results in 1.67×10^5 ml/g cm for the coefficient of absorption index of the apex. Ex. 1003 ¶ 77 (citing Ex. 1007, 5 (example 1)). Dr. Wade applies a similar conversion of Maslyukov’s extinction coefficient of 1.1×10^5 L/mol cm for its vanadium oxide variant to come up with a value of 1.83×10^5 ml/g cm. Based on these values, he testifies that Maslyukov discloses a Pmax of “ 0.5×10^5 or more,” per

claim 1. Patent Owner cites to Reichardt for the proposition that “the extinction coefficient can differ from solvent to solvent” (Prelim. Resp. 40 (citing Ex. 1008, 2333)), but it is not clear that such a difference would result in the coefficient of absorption index of the apex being less than the claimed “ 0.5×10^5 or more.” Based on a mere presumption, and without more evidence, we are not persuaded that Dr. Wade was mistaken in his testimony regarding the spectral properties of the subject dyes in Maslyukov.

f. “the plastic spectacle lens need not substantially contain a rare earth metal”

With respect to “the plastic spectacle lens need not substantially contain a rare earth metal,” Petitioner asserts that persons of ordinary skill in the art would have understood from the disclosures of Noda, Ozawa, and Maslyukov that none of these references relies on a substantial amount of rare earth metal to achieve its spectral properties. Pet. 42. Petitioner further asserts that such skilled artisans would have understood that the cited references, as patent documents, would have expressly disclosed the use of rare earth metals if they were required to achieve the spectral properties of the compounds. *Id.*

We find that at this stage of the proceeding, on the present record, Petitioner sufficiently establishes that this limitation of claim 1 would have been met by the disclosures of Noda, Ozawa, and Maslyukov for the reasons explained by Petitioner.

g. Conclusion

Neither party presents evidence of objective considerations of nonobviousness at this stage of the proceeding. *See* Pet. 65; Prelim. Resp. We have reviewed the arguments and evidence and find that at this stage of

the proceeding, on the present record, Petitioner sufficiently establishes that the combination of Noda, Ozawa, and Maslyukov teaches or suggests all of the limitations of independent claim 1 for the reasons explained by Petitioner.

5. *Dependent Claims 2–10 and 13–19*

a. *Claims 2 and 3*

Claims 2 and 3 further recite further spectral conditions for the organic dye that comprises the plastic spectacles lens. With respect to claim 2, Petitioner asserts that Maslyukov discloses that the copper variant of its tetraazaporphyrin dye has a main absorption peak of 582 nm. Pet. 44 (citing Ex. 1007, 5; Ex. 1003 ¶ 92). With respect to claim 3, Petitioner asserts that one of ordinary skill in the art would have understood that the wavelength position of the minimal rate of transmission is the same as the apex of the main absorption peak, and that both Ozawa and Maslyukov disclose or make obvious this limitation. Pet. 45–48 (citing Ex. 1006, 7; Ex. 1007, 5, Figs. 1, 2; Ex. 1003 ¶¶ 92–98).

We find that at this stage of the proceeding, on the present record, Petitioner sufficiently establishes that Noda, Ozawa, and Maslyukov meet the limitations of claims 2 and 3 for the reasons explained by Petitioner.

b. *Claims 4–6*

Claim 4 further recites that the organic dye is a tetraazaporphyrin compound defined by a specific formula (1) in that claim. Claim 5 details that the “M” element is a “divalent copper atom,” and claim 6 details that the tetraazaporphyrin compound is a tetra-*t*-butyletraazaporphyrin copper complex defined by a specific formula (2) in that claim. With respect to claim 4, Petitioner asserts that Ozawa and Maslyukov disclose the

limitations of that claim because they disclose the formula recited in claim 6, i.e., formula (2), which is a species within the genus of claim 4. Pet. 48–50. Petitioner’s assertions regarding claim 5 follow along the same lines, relying on a compound in Maslyukov with a “structure identical to one of the isomers of claim 6.” *Id.* at 50–51 (citing Ex. 1007, 3; Ex. 1003 ¶ 104). With respect to claim 6, Petitioner asserts that both Ozawa and Maslyukov disclose a tetraazaporphyrin dye with a structure identical to at least one of the isomers of claim 6. *Id.* at 51–52 (citing Ex. 1003 ¶ 106).

We find that at this stage of the proceeding, on the present record, Petitioner sufficiently establishes that Noda, Ozawa, and Maslyukov meet the limitations of claims 4–6 for the reasons explained by Petitioner.

c. Claims 7–10

Claim 7 recites that the organic dye is previously incorporated into the plastic lens wafer, and claim 8 provides that the dye is substantially the entire area of the wafer at a specific concentration. Claim 9 provides that the dye is localized to depth of 500 µm or less from one surface of the wafer, and claim 10 specifies the concentration of the dye in at least one of the component layers. With respect to claim 7, Petitioner asserts that Noda discloses an organic dye blended in the resin composition, as well as multiple methods for coating. Pet. 52–53 (citing Ex. 1005 ¶¶ 4, 76–77; Ex. 1003 ¶ 107). Also with respect to claim 7, Petitioner asserts that Ozawa discloses a method of “melting and kneading the pigment and a binder resin” to form a film or sheet and incorporate the film or sheet in a transparent layer or substrate. *Id.* at 53 (citing Ex. 1006 ¶ 43; Ex. 1003 ¶ 107).

With respect to claim 8, Petitioner asserts that dispersing the dye “in substantially the entire area of the plastic lens wafer” would have been

obvious to a person of ordinary skill in the art in view of Noda's teaching to use the organic dye to filter light in "sunglasses, regular glasses, [or] protective goggles," with such dispersal being conventional and obvious for sunglasses and other spectacles at the relevant time because such dispersal would cause the dye to cover the entire lens, thereby advantageously blocking as much undesirable light as possible from passing through the lens. Pet. 54 (citing Ex. 1005 ¶ 77; Ex. 1003 ¶ 111). Petitioner also asserts that Maslyukov discloses a concentration by "additive % weight" of 9.2×10^{-4} , which falls within the claimed range. *Id.* (citing Ex. 1007, 5; Ex. 1003 ¶ 112).

With respect to claim 9, Petitioner asserts that "previously incorporating" the organic dye would result in the organic dye being localized at a depth bound by the thickness of the coating film or sheet, and that Ozawa discloses incorporating the organic dye in the plastic lens wafer using a process that includes forming "a film or a sheet." Pet. 55–56 (citing Ex. 1006 ¶ 43). With respect to claim 10, Petitioner asserts that Noda makes obvious a component layer containing the organic dye and the previously cited concentration of Maslyukov falls within the range of claim 10. *Id.* at 56 (citing Ex. 1007, 5; Ex. 1003 ¶¶ 117–119).

We find that at this stage of the proceeding, on the present record, Petitioner sufficiently establishes that Noda, Ozawa, and Maslyukov meet the limitations of claims 7–10 for the reasons explained by Petitioner.

d. Claims 13–16

Claim 13 recites that the thermoplastic resin is a polycarbonate resin or a polyamide resin, and claim 14 recites that the thermoplastic resin is composed of both types of resins in certain proportions. Claim 15 recites

that the at least one component layer is formed from an organic resin coating agent, and claim 16 stipulates the types of resin coating agent. Petitioner asserts that, with respect to claim 13, both Noda and Ozawa disclose a transparent substrate made of “a polycarbonate resin.” Pet. 57 (citing Ex. 1005 ¶ 74; Ex. 1006 ¶ 45). With respect to claim 15, Petitioner asserts that Noda discloses both a “hard coating agent” and a “low refractive index coating agent,” and that a person of ordinary skill in the art would have understood that each disclosed “coating agent” is a “component layer” both “formed from an organic resin” and used to coat an organic resin. *Id.* at 59 (citing Ex. 1005 ¶¶ 110–112; Ex. 1003 ¶ 126). With respect to claim 16, Petitioner asserts that “[b]ecause all plastics are either thermoplastic or thermosetting, a POSITA would understand that Noda’s coating agents, discussed above with respect to claim 15, are either thermoplastic or thermosetting.” *Id.* (citing Ex. 1003 ¶ 127).

With respect to claim 14, Petitioner asserts that Noda and Ozawa disclose making the transparent substrate from a polycarbonate resin, and Ozawa discloses using a polyamide resin. Pet. 57 (citing Ex. 1005 ¶ 74; Ex. 1006 ¶¶ 45, 47; Ex. 1003 ¶ 123). Petitioner further asserts that one of ordinary skill in the art would have known about blending the polycarbonate and polyamide resins of Noda and Ozawa to create a copolymer resin, and that such skilled artisans would have understood how different relative amounts of polycarbonate resin and polyamide resin would affect the characteristics of the copolymer and would have been motivated to select a specific ratio within the claimed range. *Id.* at 57–58.

Patent Owner argues that Petitioner’s arguments regarding the subject matter of claim 14 include “misleading[] quotes” from Sugimura (Ex. 1011),

such that “Sugimura simply does not teach that polycarbonate and polyamide should be combined to form a copolymer.” Prelim. Resp. 41. Patent Owner also argues that the Petition provides no support for the assertion that skilled artisans would have been motivated to select a specific ratio within the claimed range that would result in a copolymer with desired characteristics. *Id.*

With respect to Patent Owner’s arguments regarding claim 14, for purposes of institution, we are not persuaded. Even without considering the citations to Sugimura, we are persuaded that persons of ordinary skill in the art would have been motivated to blend the polycarbonate and polyamide resins of Noda and Ozawa to create a copolymer resin. We further agree with Petitioner that skilled artisans would have selected the ratios of each to achieve the desired characteristics, with the ratio of each being within the broad range recited in claim 14.

We find that at this stage of the proceeding, on the present record, Petitioner sufficiently establishes that Noda, Ozawa, and Maslyukov meet the limitations of claims 13–16 for the reasons explained by Petitioner.

e. Claims 17 and 18

Claim 17 provides that the at least one component layer is a hard coat layer, and claim 18 provides that the component layer also includes a primer layer. Petitioner asserts that Noda discloses a hard coat layer, and that it would have been obvious to have added a primer layer to that layer because Ozawa discloses a primer and it would have aided in adhesion of the hard coat layer. Pet. 59–60 (citing Ex. 1005 ¶¶ 110, 112; Ex. 1006 ¶ 47). We find that at this stage of the proceeding, on the present record, Petitioner

sufficiently establishes that Noda, Ozawa, and Maslyukov meet the limitations of claims 17 and 18 for the reasons explained by Petitioner.

f. Claim 19

Claim 19 recites that the lens is dyed with one or more organic dyes other than the one satisfying the conditions (A). Petitioner asserts that Ozawa discloses its tetraazaporphyrin dye may be combined with a dipyrzoyl methine dye and a dipyrzoyl squarylium dye. Pet. 60 (citing Ex. 1006 ¶ 81). We find that at this stage of the proceeding, on the present record, Petitioner sufficiently establishes that Noda, Ozawa, and Maslyukov meet the limitations of claim 19 for the reasons explained by Petitioner.

E. Obviousness over Noda, Ozawa, Maslyukov, and Kanemura

Petitioner asserts that the combination of Noda, Ozawa, Maslyukov, and Kanemura would have rendered the subject matter of claims 11, 12, and 20–22 obvious to one of ordinary skill in the art at the time of the invention. Pet. 61–64. Patent Owner does not raise any argument specifically addressing this ground in the Preliminary Response. We find that at this stage of the proceeding, on the present record, Petitioner sufficiently establishes that the combination of Noda, Ozawa, Maslyukov, and Kanemura meets the limitations of claims 11, 12, and 20–22 for the reasons explained by Petitioner.

F. Obviousness over Noda, Ozawa, Maslyukov, and Colton

Petitioner asserts that the combination of Noda, Ozawa, Maslyukov, and Colton would have rendered the subject matter of claim 23 obvious to one of ordinary skill in the art at the time of the invention. Pet. 64–65. Patent Owner does not raise any argument specifically addressing this ground in the Preliminary Response. We find that at this stage of the

proceeding, on the present record, Petitioner sufficiently establishes that the combination of Noda, Ozawa, Maslyukov, and Colton meets the limitations of claim 23 for the reasons explained by Petitioner.

III. CONCLUSION

For the foregoing reasons, Petitioner has demonstrated a reasonable likelihood that it would prevail in showing that at least one claim of the '977 Patent is unpatentable.

IV. ORDER

Accordingly, it is:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review is hereby instituted as to claims 1–23 of the '977 Patent on the following asserted grounds:

Claims 1–10 and 13–19 under 35 U.S.C. § 103(a) as unpatentable over Noda, Ozawa, and Maslyukov;

Claims 11, 12, and 20–22 under 35 U.S.C. § 103(a) as unpatentable over Noda, Ozawa, Maslyukov, and Kanemura; and

Claim 23 under 35 U.S.C. § 103(a) as unpatentable over Noda, Ozawa, Maslyukov, and Colton.

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial, the trial commencing on the entry date of this Decision.

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