

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

RECYCLED PLASTICS INDUSTRIES, LLC
Petitioner

v.

TANGENT TECHNOLOGIES LLC
Patent Owner

IPR 2024-00898
U.S. Patent No. 10,981,350

PATENT OWNER'S PRELIMINARY RESPONSE

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<i>No.</i>	<i>Description</i>
<i>Exhibits Listed in Petition</i>	
RPI1001	U.S. Patent No. 10,981,350
RPI1003	U.S. Provisional Patent Application No. 62/208,928
RPI1005	Declaration of Dr. Karl Englund
RPI1010	“SMB Extrusion Melt Blender,” StaMixCo (2007) (“StaMixCo”)
RPI1011	Korean Patent No KR 10-1338611 with certified translation (“Nam”)
RPI1012	Zumbrunnen, D.A., “Chaotic Advection and Its Application to Extruding Micro- and Nanostructured Plastic Materials,” <i>Applied Plastics Engineering Handbook</i> (2011), 401-415 (“Zumbrunnen”)
RPI1013	U.S. Patent No. 9,527,341 (“Rassi”)
RPI1038	“Principles of Operation,” StaMixCo (“Previously Presented StaMixCo”)
<i>Patent Owner's Additional Exhibits</i>	
T2001	U.S. Patent No. 11,173,643
T2002	U.S. Patent Application No. 18/630,723
T2003	U.S. Patent Application No. 17/505,091
T2004	Non-Final Office Action (Dec. 15, 2017)
T2005	Supplemental Amendment and Response to Office Action (May 21, 2018)
T2006	Non-Final Office Action (July 13, 2018)
T2007	U.S. Patent No. 7, 204, 944 (“Piedboeuf”)
T2008	U.S. Patent Application Publication 2011/0177291 (“Sudano”)
T2009	Final Office Action (Jan. 2, 2019)
T2010	Appeal Brief (Aug. 23, 2019)

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T2011	Decision on Appeal (Dec. 11, 2020)
T2012	Notice of Allowability (Mar. 22, 2021)
T2013	Response to Office Action (Sept. 13, 2018)
T2014	Examiner's Answer to Appeal Brief
T2015	Information Disclosure Statement (Feb. 27, 2018)
T2016	<i>Tangent Techs. LLC v. Recycled Plastics Indus., LLC</i> , No. 1:23-cv-00261-WCG, D.I. 65, Decision and Order on Counterclaims (July 24, 2024)
T2017	Examiner's Search Strategy and Results (July 7, 2018)
T2018	<i>Tangent Techs. LLC v. Recycled Plastics Indus., LLC</i> , No. 1:23-cv-00261-WCG, D.I. 66, Claim Construction Order (July 24, 2024)

Tangent Technologies, LLC (“Patent Owner”) submits this Preliminary Response to the Petition for *inter partes* review of U.S. Patent No. 10,981,350 (“the ‘350 patent” or “‘350,” Ex. RPI1001).

I. INTRODUCTION

The Petition should not be instituted for at least the following reasons:

First, the Petition should be denied under 35 U.S.C. § 325(d) because—for all proposed grounds—the same or substantially the same prior art and arguments were previously presented to the Office.

Second, Grounds 1-2 fail to make a *prima facie* case showing that Korean Patent No KR 10-1338611 with Certified translation (“Nam,” Ex. RPI1011), “SMB Extrusion Melt Blender,” StaMixCo (2007) (“StaMixCo,” Ex. RPI1010), and U.S. Patent No. 9,527, 341 (“Rassi,” Ex. RPI1013) (for Ground 2) satisfies at least one claim limitation found in independent Claim 1, which is “wherein a plurality of individual layers of the first and second sets of polymer layers alternate within the board and extend along a substantially uninterrupted curvilinear path originating proximate the first side of the board and terminating proximate to the second side of the board.”

Third, Grounds 3-4 fail to make a *prima facie* case showing that Non-Patent Literature Zumbrunnen, D.A., “Chaotic Advection and Its Application to Extruding Micro- and Nanostructured Plastic Materials,” *Applied Plastics Engineering*

Handbook (2011), 401–415 (“Zumbrunnen,” Ex. RPI1012) and Rassi (for Ground 4) satisfies at least one claim limitation found in independent Claim 1, which is “wherein a plurality of individual layers of the first and second sets of polymer layers alternate within the board and extend along a substantially uninterrupted curvilinear path originating proximate the first side of the board and terminating proximate to the second side of the board.”

Fourth, all of Petitioner’s proposed grounds are deficient because Petitioner failed to (i) address the construction they proposed in district court, (ii) show how the prior art satisfies their district court construction, or (iii) explain why Petitioner is justified in taking inconsistent positions in district court and this proceeding.

The foregoing sections begin with an overview of the ’350 patent, the technology it covers, and its file history in Section II. Next, the *First* deficiency—that the same or substantially the same prior art and arguments were previously before the Office, necessitating denial of the petition under § 325(d)—is explained in Section III. Within the § 325(d) framework, the *Second* deficiency, related to Grounds 1 and 2 is addressed in Section III.C, followed by the *Third* deficiency, related to Grounds 3 and 4 in Section III.D. Relying on the explanations in Section III, Section IV explains Petitioner’s failure to show a reasonable likelihood that any of the challenged claims are obvious. Then the *Fourth* deficiency, which centers on

Petitioner's failure to address claim construction by the district court, is discussed in Section V.

Considering the overwhelming deficiencies of the Petition, Petitioner has failed to establish a reasonable likelihood of success on the merits. Therefore, the Board should exercise its discretion to deny institution. *See SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018); *Deeper, UAB v. Vexilar, Inc.*, IPR2018-01310, Paper 7 at 41–43 (PTAB Jan. 24, 2019) (denying institution of all 23 claims and 4 grounds when there was a reasonable likelihood of success with respect to only two claims in one ground because it “would not be an efficient use of the Board’s time and resources”).

II. THE '350 PATENT AND ITS FILE HISTORY

A. The '350 Patent

The '350 patent is directed to a wood-grained polymer substrate with a plurality of layers of different colors, formed onto elongated boards and used in the production of various end products similar to natural woods. *See* Ex. RPI1001, '350 patent, at Abstract. The '350 patent describes the rising need for polymer composites that can be used as a natural wood substitute or replacement. The '350 patent explains that in the years leading up to its filing, the decking industry had adopted the use of composites and alternative plastic lumber decking products, typically comprising 50% wood fiber or particles and 50% polyethylene plastic to act as a

binder to hold the wood particles together. *Id.* at 1:19-24. However, the '350 patent describes that, because of the “undesirable qualities” of such composite products, “many companies have added a coextruded polymer cap layer around the exterior of the board,” which contains little or no wood fiber, to protect the wood fiber/plastic matrix in the core from exposure to the environmental conditions. *Id.* at 1:25-30.

The '350 patent recognizes that manufacturers have introduced several colors to the exterior coextruded layer to produce a surface comprising different color tones in hopes of emulating natural wood. However, the simulated wood grain appearance is at the surface level only. This means that cutting or planing of the wood composite removes the coextruded cap layer and undesirably exposes the standard fiber-filled, homogenous core. *See* Ex. RPI1001, '350, at 1:40-54. The industry had tried adapting by creating products with multiple color tones by utilizing color concentrates (“streaker colors”) that have carrier resins that melt at relatively high temperatures during the standard extrusion process. This approach causes the streaker color concentrates to release color randomly and produce a streak effect. However, the streakers only produce a line of color in a single direction, usually along the extrusion direction. So, cutting the composite board would **not** create a woodgrain appearance through a core of the board. *Id.*

The '350 patent also explains that other composite products such as streaker pellets swirled in an extruder to form a “two-dimensional” cap layer for co-extrusion

with a foam core (U.S. Pat. App. Pub. No. 2011/0177291) result in a thin cap layer, which does not extend into the core of the finished product. Additionally, polymer boards having wood-grained appearance through a core of the board (JP Pat. No. H07-214631) or being created by simultaneously extruding plastics of different colors to coalesce into a single product (FR Pat. No. 2,738, 768) comprise many inconsistencies arising from the turbulence created due to the turbulent flow of extrusion and can also comprise undesirable characteristics. Ex. RPI1001, '350, at 2:4-24.

To address these shortcomings, the '350 patent inventors created a high-density polyethylene wood-grained substrate which includes a plurality of layers of different colors. The substrate is formed into elongated boards including a first set of polymer layers formed that include a first colorant and a second set of polymer layers that include a second colorant different than the first colorant. The first and second layers alternate within the substrate to form a wood-grained appearance throughout the entire substrate. Referring to FIGS. 6 and 9 as well FIGS. 10 and 11 from the '350 patent represented below, sectional views (FIGS. 6 and 10) and top-down views (FIGS. 9 and 11) of two embodiments of the wood-grained substrate are presented, respectively.

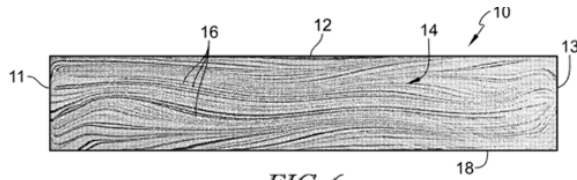


FIG. 6

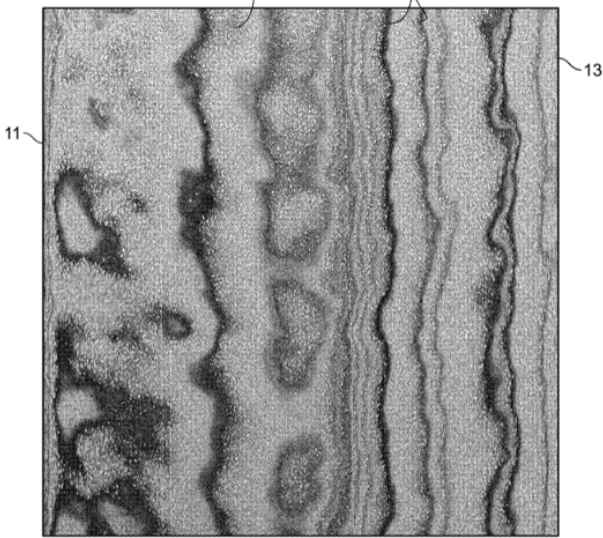


FIG. 9

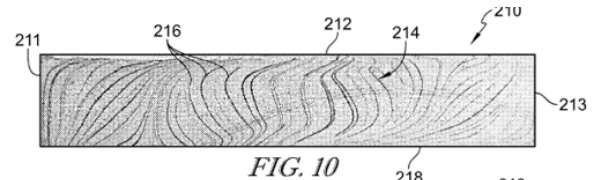


FIG. 10

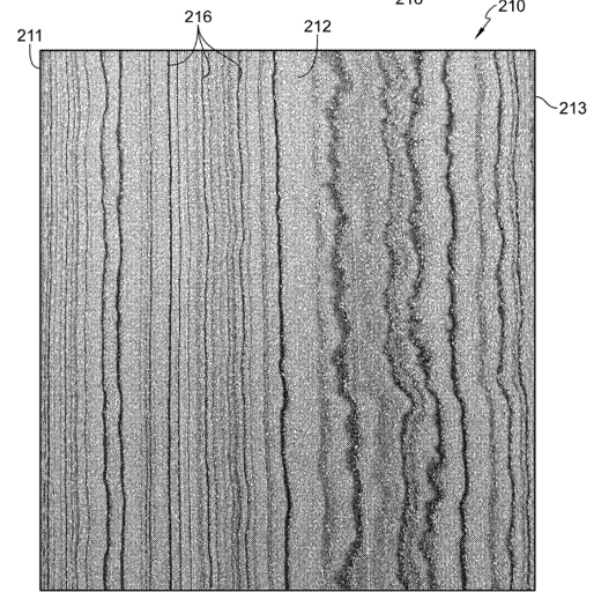


FIG. 11

Referring to the reproduced FIGS. 6, 9, 10, and 11 above from the '350 patent, the wood-grained polymer substrate **10, 210** includes a multi-tone, simulated natural woodgrain effect that runs throughout the entire substrate (cross section) as presented in FIGS. 6 and 10. The simulated wood grains **16, 216** also extend to an outer surface, for example top surface **12, 212**, of each substrate **10, 210** so that when removal of material occurs, such as through planing or cutting, the multi-tone woodgrain effect remains both on the surface **12, 212** as well as within an exposed core **14, 214** of the substrates as suggested in FIGS. 9 and 11. See Ex. RPI1001, '350, at 3:52-61.

Regarding the figures of the '350 patent reproduced above, the patent explains, “a width direction of the substrate **10** is oriented such that wood grains **16** extend between lateral sides **11, 13** of substrate **10** as suggested in FIG. 6. The layers of first and second polymers **120, 124** are stacked from a bottom surface **18** of substrate **10** toward the top surface **12.**” See Ex. RPI1001, '350, at 7:21:27. Contrastingly, “a width direction of the substrate **10** is oriented such that wood grains **216** extend between top surface **212** and a bottom surface **218** of substrate **210** as shown in FIG. 10. The layers of first and second polymers **120, 124** are stacked from a lateral surface **211** toward a lateral surface **213** of substrate **210.**” *Id.* at 7:28-33. “***Generally, the width direction is perpendicular to the length direction and rotationally oriented around the length direction.***” *Id.* at 7:33-35 (emphasis added).

Referring to the figures from the '350 patent reproduced above, “the grains **16, 216** extend along ***curvilinear paths*** across the width of the substrates **10, 210**” (described above). *Id.* at 7:43-45 (emphasis added). As shown in FIGS. 6 and 10, “a majority of the grains **16, 216** extend ***substantially uninterrupted*** across the board, i.e., with minimal or no gaps in the visible grain **16, 216.**” *Id.* at 7:45-48 (emphasis added).

The wood-grained polymer substrate claimed in the '350 patent is an improvement over the prior art because it can be better used for decking and other

wood projects. Among other things, the wood-grained polymer substrate of the '350 patent having alternating layers of differently colored polymer material allows the wood-grained appearance to run through the core of the substrate such that the simulated wood grains is exposed when the substrate is cut. Examples of this benefit are shown, for example, in FIGS. 12 and 13 of the '350 patent which show arm rests for an Adirondack chair.

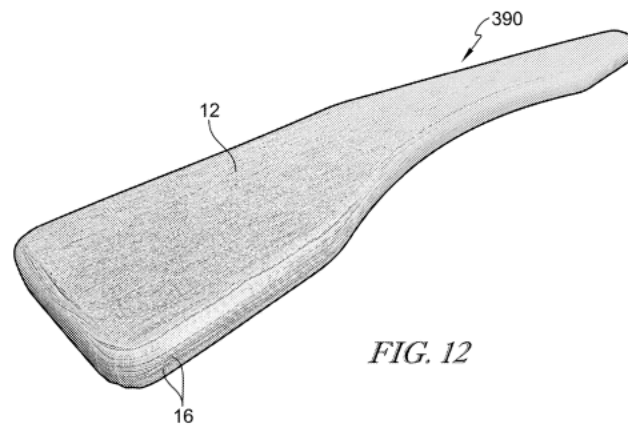


FIG. 12

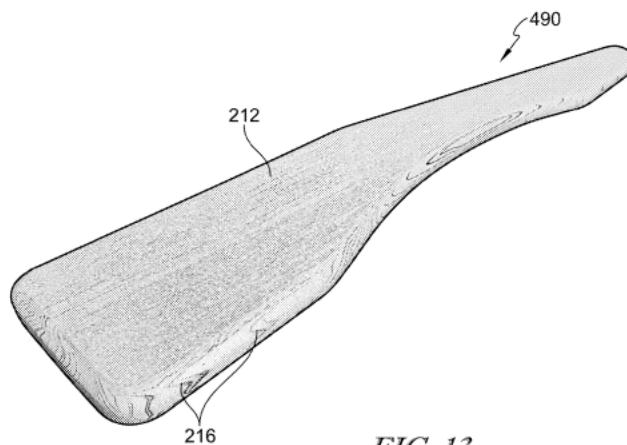


FIG. 13

The woodgrain polymer board is also useful in the production of other types of end products, such as furniture and decking.

B. The '350 Patent's File History

The '350 patent issued from U.S. Patent Application No. 15/245,948 (the "'948 Application"). *See* Ex. RPI1001, '350, at cover. The '948 Application claims priority from the U.S. Provisional Patent Application No. 62/208,928 (the "'928 Application," Ex. RPI1003). *Id.* The Patent Office examined all patents and patent applications in this family during the underlying prosecution. *See* Ex. RPI1001 ('350), Ex. T2001 ('643), Ex. T2002 ('723 Application), and Ex. T2003 ('091 Application).

The '948 Application was originally filed with three independent claims—Claim 1 reciting a natural wood-grained polymer board, Claim 10 reciting a simulated natural wood-grained polymer substrate and Claim 16 reciting a polymer lumber end product. On December 15, 2017, the Examiner rejected the claims under § 103 over various prior art references. Claims 1, 10 and 16 were rejected under § 103 over U.S. Patent Application Publication 2003/0021915 ("Rohatgi"). *See* Ex. T2004, Non-Final Office Action (Dec. 15, 2017), at 3. Among other reasons, the Examiner noted that "the board [of Rohatgi] has a first end, a second end, a first, and a second side such that the sides, as defined by the examiner, define the width of the board and the ends define the length of the board with the core in between," and further noted that "the layers alternate in the width direction of the board and the board may be imparted with curves ('curvilinear') as pointed out in the figure above

along with the curve being *uninterrupted* at the curve.” *See id.* at 4 (emphasis original).

On March 21, 2018, the Patent Owner filed a Supplemental Amendment and Response to Office Action (following a Response to the Office Action dated March 13, 2018 and an Applicant-Initiated Interview on 20 April, 2018), where newly added Claim 25 and Claims 1, 10 and 21 (Claims 17-24 were newly added and Claim 16 was cancelled in the Response to the Office Action dated March 13, 2018) were amended to recite “a plurality of individual layers of the first and second sets of polymer layers alternate within the board and extend along a substantially uninterrupted curvilinear path originating proximate the first side of the board and terminating proximate the second side of the board.” *See* Ex. T2005, Supplemental Amendment and Response to Office Action (May 21, 2018) at “Amendments to the Claims.”

On July 13, 2018, the Examiner conceded that the Patent Owner’s proposed amendments in the Supplemental Amendment and Response to Office Action dated March 21, 2018 overcame the rejection under § 103 over Rohatgi which “only shows one continuous line extending from one side of the board to the second side and does not teach a plurality of these layers extending from side to side.” *See* Ex. T2006, Non-Final Office Action (July 13, 2018), at 28. The Examiner presented new rejections under § 103 over U.S. Patent No. 7,204,944 (“Piedboeuf,” Ex. T2007) and

U.S. Patent Application Publication 2011/0177291 (“Sudano,” Ex. T2008). The rejections under § 103 over Piedboeuf and Sudano were held and presented in the Final Office Action dated January 2, 2019. *See* Ex. T2009, Final Office Action (Jan. 2, 2019).

On August 23, 2019, the Patent Owner filed an Appeal Brief in response to the Final Office Action dated January 2, 2019. In the Appeal Brief, the Patent Owner argued that

Piedboeuf, however, does not teach each and every element of these claims. While the Office Action relies on supposed similarities in the processes of Piedboeuf and the present application as evidence that the resulting structures formed by the cited processes would be the same as the claimed structure, it is noted, however, that the present application does not currently claim any process. Instead, the present claims are directed to “simulated natural wood-grained polymer” boards and substrates of a particular structure. It is clear that the presently claimed “simulated natural wood-grained polymer” boards and substrates include particular arrangements and structures not expressly taught by Piedboeuf.

See Ex. T2010, Appeal Brief (Aug. 23, 2019), at 8.

On December 11, 2020, the Patent Trial and Appeal Board reversed the Examiner’s rejections, finding that “the Examiner does not establish that Piedboeuf’s products, merely due to having multiple bands with color variation, are equivalent to the Appellant’s simulated natural wood grained products.” *See* Ex. T2011, Decision on Appeal (Dec. 11, 2020), at 4. The Board reasoned that, despite

Piedboeuf and Sudano teaching co-extrusion processes and layered products with various colors, the Examiner failed to address key differences in the processes described by Piedboeuf and the secondary reference, Sudano. Nor did the Examiner “explain how, regardless of those differences, Sudano would have led one of ordinary skill in the art to use Piedboeuf’s process to make [sic] a simulated natural wood product.” *Id.* at 5. Further, The Decision on Appeal ultimately concluded that, on the record, the Examiner’s rejections were “based upon impermissible hindsight in view of the Appellant’s disclosure.” *Id.*

On March 22, 2021, in the Notice of Allowability that followed the Decision on Appeal, the Examiner conceded that “in response to the decision from the Patent Trial and Appeal Board (PTAB) dated 12/11/2020, Piedboeuf fails to teach the simulated natural wood-grained polymer boards of claims 1, 10, 21 and 25 in that the examiner failed to establish that Piedboeuf’s products are equivalent to those described in the instant claims.” *See* Ex. T2012, Notice of Allowability (Mar. 22, 2021), at 2. More specifically, “the rejection failed to indicate that the products being formed from the streams of viscous material would have the same pattern as those described in the claims.” *Id.* Claims 1, 10, 21 and 25 were therefore allowed over Piedboeuf. *Id.*

III. THE BOARD SHOULD DENY INSTITUTION UNDER 35 U.S.C. § 325(d)

The Board should deny institution under § 325(d) because Petitioner's references and arguments are the same as, or cumulative to, what the Board and Examiner considered during prosecution, and Petitioner has failed to demonstrate that either the Board or the Examiner erred in any material way.

A. Legal Standards

Under 35 U.S.C. § 325(d), the Board applies a two-part test. If either question is ***not*** answered in the affirmative, then the Board may reject the *inter partes* review petition:

(1) [a] whether the same or substantially the same art previously was presented to the Office or [b] whether the same or substantially the same arguments previously were presented to the Office; and

(2) if either condition of [the] first part of the framework is satisfied, whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.”

Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH, IPR2019-01469, Paper 6 at 8 (P.T.A.B. Feb 13, 2020). “Previously presented art includes art made of record by the Examiner, and art provided to the Office by an applicant, such as on an Information Disclosure Statement (IDS), in the prosecution history of the challenged patent.” *Id.* at 7–8.

In a later decision, the Board set forth the following non-exhaustive list of factors to assist in further considering the two-part § 325(d) framework:

- (a) the similarities and material differences between the asserted art and the prior art involved during examination;
- (b) the cumulative nature of the asserted art and the prior art evaluated during examination;
- (c) the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection;
- (d) the extent of the overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art;
- (e) whether Petitioner has pointed out sufficiently how the Examiner erred in its evaluation of the asserted prior art; and
- (f) the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments.

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).

Becton, Dickinson factors (a), (b), and (d) relate to the first part of the *Advanced Bionics* framework (i.e., whether the art or arguments presented in the Petition are the same or substantially the same as those previously presented to the Office), and factors (c), (e), and (f) relate to the second part of the *Advanced Bionics* framework (i.e., whether petitioner has shown the Office made a material error in its earlier consideration of the prior art or arguments). *Advanced Bionics*, Paper 6

at 10. “If a condition in the first part of the framework is satisfied and the petitioner fails to make a showing of material error, the Director generally will exercise discretion not to institute *inter partes* review.” *Id.* at 8–9. “[T]his framework reflects a commitment to defer to previous Office evaluations of the evidence of record unless material error is shown.” *Id.* at 9.

B. Discretionary Denial is Appropriate

As set forth in more detail below, discretionary denial is appropriate here on all grounds because Petitioner’s asserted art and arguments have already been considered and overcome during examination. *NHK Spring Co., Ltd. v. Intri-Plex Techs., Inc.*, IPR2018-00752, Paper 8, at 11–12 (PTAB Sept. 12, 2018) (denying institution).

All Grounds in the Petition are based on primary references Nam or Zumbrunnen, which are identical or substantially the same as, and cumulative of, references that were considered during prosecution of the ’350 patent and related applications. Petitioner’s art and arguments, including secondary references, are also the same and/or cumulative of the Examiner’s arguments made during prosecution. For this reason, Petitioner’s challenge should fail based on the first prong of the *Advanced Bionics* framework.

Furthermore, Petitioner's arguments regarding these references fail to make the requisite *prima facie* showing that the references Petitioner raises satisfy each element of Claim 1. This, too, is grounds for denial.

Even when reaching the second prong of the *Advanced Bionics*—which is not necessary given that Petitioner's art and arguments are at best cumulative—Petitioner's challenge likewise fails. Despite the overlap between art and arguments raised by Petitioner here and those considered by the Patent Office during the prosecution, Petitioner makes no attempt to establish that the Examiner “erred in evaluating the art or arguments” already presented to the Office, as has “generally [been] required” for such cumulative petitions to be instituted under § 325(d). *Advanced Bionics*, Paper 6 at 8.

Therefore, the Board should deny institution under § 325(d), because (1) the art and arguments now raised by Petitioner are the same as, or substantially similar to, art and arguments that the Examiner previously considered, and (2) Petitioner has not at all demonstrated that the Office materially erred as to the patentability of the challenged claims of the '350 patent.

C. Grounds 1-2 Rely on the Same or Substantially the Same Art and Arguments that were Considered by the Patent Office without Error

In Grounds 1-2, Petitioner relies on Nam (Ex. RPI1011), StaMixCo (Ex. RPI1010), and Rassi (Ex. RPI1013).

Ground	Basis	Claims	Reference(s)
1	§ 103	1-4, 6, 9-12, 15, 17, 19-22, and 24	Nam alone or in combination with StaMixCo
2	§ 103	5, 7-8, 13-14, 16, 18, and 23	Nam alone or in combination with StaMixCo and Rassi

Nam discloses a “manufacturing apparatus and method of synthetic wood having striped grain and synthetic wood manufactured from the same” having a striped grain on both the surface and interior. *See* Ex. RPI1011, Nam, at Abstract and [0001]. StaMixCo discloses several static mixer designs for use in the extrusion of viscous resins and polymers. *See* Ex. RPI1010, StaMixCo, at 2, 8. Rassi discloses “an extruded board” having a “realistic look similar to...natural wood.” *See* Ex. RPI1013, Rassi, at Abstract, 1:57-58.

As explained in more detail below, prior art identical and/or similar to Nam, StaMixCo, and Rassi, such as Piedboeuf, Sudano, and Rohatgi, were considered by the Examiner and Board during the underlying prosecution. The Board should therefore exercise its discretion and deny institution on Grounds 1 and 2.

1. Part 1 (*Becton, Dickinson* Factors (a), (b), (d)): the Examiner considered substantially the same art and/or arguments during prosecution

Grounds 1 and 2 rely on primary reference Nam, alone or in combination with StaMixCo or Rassi. Each of these references is identical to or cumulative of references that were considered by the Examiner and Board during the underlying

prosecution. Therefore, Petitioner's arguments with respect to these references fail the first prong of the § 325(d) test, as informed by *Becton, Dickinson*.

a. Petitioner's obviousness arguments based on Nam are cumulative of arguments considered during prosecution

The Board has explained that where a petitioner's prior art challenges, even if based on art not previously presented to the Office, "are similar" to the arguments "raised by the Examiner" during prosecution, discretionary denial is appropriate under § 325(d). *See Xilinx, Inc. v. Analog Devices, Inc.*, IPR2021-00294, Paper 9 at 27 (PTAB June 10, 2021) ("[I]n the context of the first part of the *Advanced Bionics* framework, we find that Petitioner's prior art challenges based on Dabbagh-Sadeghipour and Fetterman in this proceeding are the same or substantially the same art or arguments previously presented to the Office."). Petitioner's arguments based on Nam are cumulative of, and overlap with, references that the Examiner relied upon and discussed during prosecution of the '350 patent.

Specifically, during prosecution of the '350 patent, the Examiner cited Piedboeuf (Ex. T2007) in connection with the limitation "wherein a plurality of individual layers of the first and second sets of polymer layers alternate within the board and extend along a substantially uninterrupted curvilinear path originating proximate the first side of the board and terminating proximate to the second side of

the board” as recited in Claim 1. *See* Ex. T2006, Non-Final Office Action dated July 13, 2018 at 6. Specifically, the Examiner asserted this limitation was met because it was obvious that the system taught by Piedboeuf would result in the claimed structure. *Id.* at 6.

In response, Patent Owner argued that Piedboeuf—alone or in combination with the second reference, Sudano (Ex. T2008)—does not “teach all of the elements” of Claim 1. *See* Ex. T2013, Response to Office Action filed on September 13, 2018, at 8–9. Patent Owner explained that simply describing a process is insufficient to show a particular structure would result from the process:

[the Office Action] “makes a blanket conclusion, without support in the cited references or otherwise, that the result of the process described in Piedboeuf “would ultimately result” in the claimed structures of the present application. Yet, the Office Action admits that the cited references fail to show these specific structures. ***The Office Action also fails to describe how one skilled in the art could arrive at the claimed structures simply by reviewing the processes of the cited references without undue experimentation or the benefit of hindsight bias from the disclosure of the present application.***”

Id. at 9 (emphasis added).

The Examiner maintained the rejection and Patent Owner appealed to the Board. The Board reversed, agreeing with Patent Owner that the rejection was improper. In its decision, the Board explained “the Examiner does not establish that Piedboeuf’s products, merely due to having multiple bands with color variation, are

equivalent to the Appellant’s simulated natural wood grained products” and that “[t]he Examiner does not address the differences between Piedboeuf’s and Sudano’s processes and explain how, regardless of those differences, Sudano would have led one of ordinary skill in the art to use Piedboeuf’s process to made [sic] a simulated natural wood product.” *See* Ex. T2011, Decision on Appeal at 4–5. The Decision found that the Examiner’s rejections were impermissibly based on hindsight. *Id.* at 5.

On remand from the Board, the Examiner conceded that “in response to the decision from the Patent Trial and Appeal Board (PTAB) dated 12/11/2020, Piedboeuf fails to teach the simulated natural wood-grained polymer boards of claims 1, 10, 21 and 25 in that the examiner failed to establish that Piedboeuf’s products are equivalent to those described in the instant claims.” *See* Ex. T2012, Notice of Allowability (Mar. 22, 2021), at 2.

Piedbouef and Nam are substantially similar as references, and the arguments Petitioner raised with respect to Nam are substantially similar to arguments raised regarding Piedbouef during prosecution of the ’350 patent.

First, Piedbouef’s system, cited by the Examiner during the ’350 patent prosecution, is similar to the system taught by Nam, cited by the Petitioner. Two figures from Piedbouef and one from Nam are illustrative:

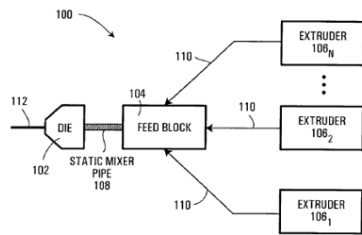
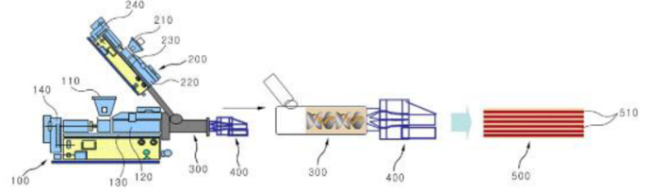


FIG. 1



FIG. 3

Piedboeuf



Nam

The Petitioner presents FIG. 3 of Nam (reproduced above; *see also* Ex. RPI1011) to show that “Nam discloses a ‘manufacturing apparatus and method of synthetic wood having striped grain, and synthetic wood manufactured from the same’” and that Nam “teaches separately melting polymer mixtures of two different colors and extruding each into a static mixer.” *See* Petition at 24–25. Referring to FIG. 3 of Nam, the system disclosed by Nam includes multiple extruders (**100, 200**), a static mixer (**300**), a feed block (not shown in FIG. 3) for feeding the polymers before mixing via the static mixer (**300**), and a die (**400**, i.e., mold) disposed at the outlet of the static mixer (**300**).

This is strikingly similar to Piedboeuf (Ex. T2007), which as noted above, was considered by the Examiner and the Board during prosecution of the '350 patent. Prior to the Board's reversal, the Examiner explained the system taught by

Piedboeuf, as illustrated by FIGS 1. and 3 (reproduced above; *see also* Ex. T2007), as one that “includes a die [i.e mold], a feed block, and at least two extruders as shown below with the static mixer (Col. 1, Lines 64-66; Fig. 1)” and teaches the process of “providing a first and a second stream of viscous materials of different colors and combining those streams feeding them into a helical static mixer, shown in Fig. 3 (Col. 1, Lines 49-63).” *See* Ex. T2014, Examiner’s Answer to Appeal Brief at 7. Thus, the system of Nam—raised by Petitioner—is substantially similar to the system of Piedboeuf—already considered during prosecution of the ’350 patent.

Second, Petitioner’s arguments about Nam’s system are no different than the Examiner’s argument about Piedboeuf’s system that were already rejected by the Board. Just like the Examiner, Petitioner argues that the system taught by Nam produces “grain patterns [that] are depicted using seemingly straight lines” and without providing additional disclosure to the specifically recited claim limitation “wherein a plurality of individual layers of the first and second sets of polymer layers alternate within the board and extend along a substantially uninterrupted curvilinear path originating proximate the first side of the board and terminating proximate to the second side of the board.” *See* Petition, at 41. And like the Examiner, Petitioner simply states that “[a] POSITA would have expected a helical static mixer to create curved, not straight patterns” and “would have therefore understood the polymer layers of Nam to ‘extend along a substantially *curvilinear* path.’” *See id.* at 41–44,

42 (emphasis original). The Board has already found that this type of conclusory assertion from the Examiner was insufficient to establish Piedboeuf's system teaches the recited claim limitation. The Board should find Petitioner's same conclusory statement is similarly insufficient.

b. Petitioner's arguments regarding Nam fail to make a prima facie showing related to Claim 1

Appearing to acknowledge the deficiencies discussed above, Petitioner also states that “[i]f PO were to argue that Nam does not disclose the alternating polymer layers forming a ‘*natural wood-grained appearance*’ or not extending along a ‘*curvilinear*’ path, these elements would have been obvious in view of StaMixCo” and that a “POSITA would have been motivated and able to combine the static mixer disclosed in StaMixCo with Nam's extrusion apparatus as previously discussed.” See Petition at 41–42 (emphasis original).

Petitioner's conclusory argument fails because it has not sufficiently shown how one skilled in the art could arrive at the claimed structure by simply reviewing the process described in these references. Petitioner provides no additional disclosure as to how Nam's apparatus could be combined with the static mixer of StaMixCo to produce a substrate with a “natural wood-grained appearance” and polymer layers that “extended along a substantially uninterrupted curvilinear path” as taught by Claim 1 of the '350 patent. Just like the Examiner's rejections that were

reversed by the Board, Petitioner's combination of Nam and StaMixCo is "based upon impermissible hindsight." *See* Ex. T2011, Decision on Appeal, at 5.

Not only are Petitioner's arguments regarding Nam cumulative, but they reveal that Petitioner has failed to show how Nam satisfies Claim 1.

c. StaMixCo is cumulative of art and arguments considered during prosecution

Like Nam, StaMixCo (Ex. RPI1010) is also cumulative of the prior art and arguments considered by the Examiner during prosecution. Petitioner relies on StaMixCo for its alleged teaching of "static mixer designs" used in the extrusion of "molten polymer[s]," including a helical static mixer in which two differently colored "viscous resin[s]" are pumped through six static mixing elements, with "cross sectional cuts...made at the outlet of each mixing element" to show the resulting mix following each element. *See* Petition at 23–24, referencing StaMixCo (Ex. RPI1010), at 10 and at FIG. 2.

A reference identical in relevant aspects to StaMixCo and titled "StaMixCo, Principles of Operation" (hereinafter, "Previously Presented StaMixCo," Ex. RPI1038) was cited by the Patent Owner during the prosecution of the '350 patent:

Patent Owner Preliminary Response

IPR 2024-00898

Patent No. 10,981,350

OTHER - NON PATENT LITERATURE DOCUMENTS				
Examiner Initials	Doc. No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number (s), publisher, city and/or country where published.	Translation	
			Yes	No**
	CT	StaMixCo, "Principles of Operation of Static Mixers," Static Mixer Products & Technology, accessed on the Internet at: https://web.archive.org/web/20081209081624/http://www.stamixco-usa.com:80/principles-of-operation/default.html (9 Dec. 2008).		

IMS 11707170v1

EXAMINER	/DANIEL P DILLON/	DATE CONSIDERED	07/07/2018
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* A concise statement of relevance is being submitted in lieu of a translation. 37 CFR 1.60(c)(2)

See Ex. T2015, Information Disclosure Statement (Feb. 27, 2018), at 1. The Examiner signed this IDS as considered on July 7, 2018. *Id.*

For purposes of § 325(d), prior art cited in an IDS is deemed previously presented to, and considered by, the Patent Office. *See Advanced Bionics*, Paper 6 at 7–8 (stating that previously presented art includes art cited in an IDS); *Microsoft Corp. v. Koninklijke Philips N.V.*, IPR2018-00279, Paper 11 at 12, 14–15 (PTAB June 8, 2018); *Fellowes, Inc. v. Treefrog Devs., Inc.*, IPR2020-01509, Paper 11 at 7–8, 17 (PTAB Feb. 22, 2021) (denying institution based on § 325(d) because the prior art reference was considered by the Examiner as it was cited in an IDS and listed on the face of the patent); *Ocado Grp. PLC v. Autostore Tech. AS*, IPR2021-00412, Paper 9 at 34–35 (PTAB July 21, 2021) (reference listed in IDS “was previously before the Office”); *Eyenovia, Inc. v. Sydnexis*, IPR2022-00963, Paper 7 at 10–11 (PTAB Nov. 8, 2022) (references listed in IDS were ““previously

presented’ for purposes of’ § 325(d)) (denying institution); *Palo Alto Networks, Inc. v. Centripetal Networks, Inc.*, IPR2021-01155, Paper 12 at 14 (PTAB Jan. 20, 2022).

StaMixCo and the Previously Presented StaMixCo are identical references in aspects relevant to the Petition. StaMixCo is a brochure that describes static and other mixers available from StaMixCo. The Previously Presented StaMixCo is a webpage printout describing the same static mixers. Both references disclose the same relevant information and use nearly identical figures to explain the principles of operation of the static mixers, with the only difference being slightly different words used in labels to describe the same operation of feeding material to the mixing element. For instance, as shown below, FIG. 20 of StaMixCo, on which the Petitioner relies (*see* Petition at 23) to formulate the argument, is nearly identical to FIG. 3 of Previously Presented StaMixCo.¹ As an additional example, FIG. 17 of StaMixCo is identical to FIG. 2 of Previously Presented StaMixCo.

¹ FIG. 20 of StaMixCo and FIG. 3 of Previously Presented StaMixCo only differ in the symbol/drawing for the “mixing element” and “feed to mixing element” presented in the top left corner of both figures.

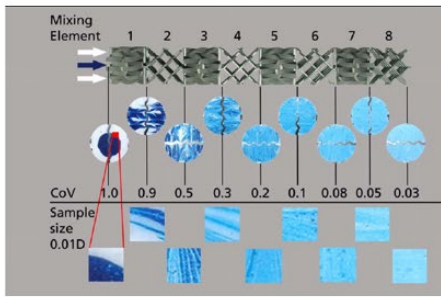


FIG. 17

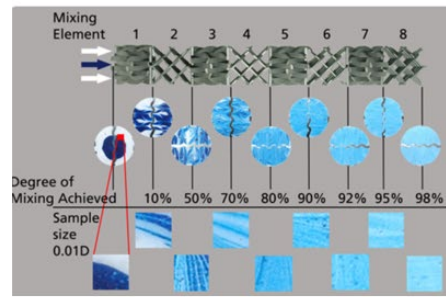


FIG. 2

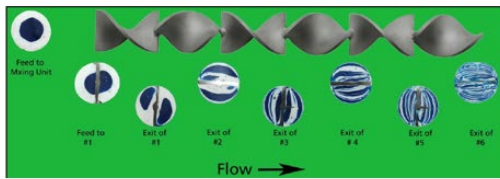


FIG. 20 (StaMixCo)

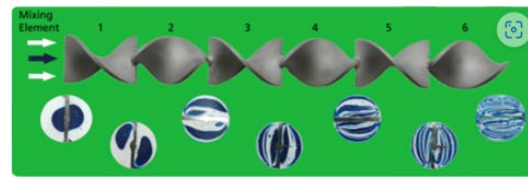


FIG. 3

StaMixCo

Previously Presented StaMixCo

Petitioner has not identified any relevant differences between these references.

The identical nature of these two StaMixCo references was confirmed during the parties' co-pending district court litigation. During the litigation, the district court denied Petitioner's motion for leave to add an inequitable conduct counterclaim against Patent Owner based on failure to disclosed StaMixCo, finding that because "Defendant [Petitioner] has failed to adequately allege that the StaMixCo marketing materials [StaMixCo, Ex. RPI1010] are non-cumulative of other information already disclosed to the USPTO [Previously Presented StaMixCo, Ex. RPI1038], it fails to state a counterclaim for unenforceability of the '350, '234,

and '235 Patents due to inequitable conduct on this basis.” See Ex. T2016, *Tangent Techs. LLC v. Recycled Plastics Indus., LLC*, No. 1:23-cv-00261-WCG, D.I. 65 (July 24, 2024), at 12. This further demonstrates that the StaMixCo reference cited by the Petitioner is entirely cumulative of the Previously Presented StaMixCo reference, which was already considered by the Examiner during prosecution of the ‘350 patent.

d. Rassi is cumulative of art and arguments considered during prosecution

Petitioner makes an additional argument related to Nam (Ex. RPI1011), bringing in a third alleged prior art reference, arguing that claims 5, 7-8, 13-14, 16, 18, and 23 are obvious over Nam, in view of Rassi (Ex. RPI1013). Petitioner alleges that Rassi teaches “plastic lumber created through an extrusion process,” “creating plastic lumber ‘exhibiting a “natural” look like the look of grains in wood boards,’” and “creating plastic lumber where ‘the graining pattern extends into the core.’” See Petition at 53–54.

The Examiner, however, already considered Rassi during prosecution of the ‘350 patent. Specifically, the Examiner recorded the Prior Art search he conducted, which included searching for U.S. Patent No. 9,527,341, which is Rassi.

S92	2	"9527341".pn. or "20080093763".pn.	US-PGPUB; USPAT	OR	OFF	2018/07/06 12:12
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See Ex. T2017, Examiner's Search Strategy and Results (July 7, 2018), at 6. The Examiner was aware of Rassi when examining the claims of the '350 patent, and Petitioner's arguments with respect to Rassi are cumulative.² See, e.g. *Molins PLC v. Textron, Inc.*, 48 F.3d 1172, 1185 (Fed. Cir. 1995) ("When a reference was before the examiner, whether *through the examiner's search* or the applicant's disclosure, it cannot be deemed to have been withheld from the examiner.") (emphasis added; quoting *Scripps Clinic & Rsch. Found. v. Genentech, Inc.*, 927 F.2d 1565, 1582 (Fed. Cir. 1991) (overruled on other grounds)).

Petitioner has failed to establish that the references it raised (Nam, alone or in combination with StaMixCo or Rassi) or its related arguments are not cumulative. As such, Petitioner has not satisfied the first prong of the § 325(d) framework.

2. Part 2 (*Becton, Dickinson* Factors (c), (e), (f)): Petitioner has not established that the Office materially erred

As it relates to Grounds 1-2, Petitioner has also not met its burden of showing that the Office erred in a manner material to patentability in concluding the non-obviousness of the claims. See *Advanced Bionics*, Paper 6 at 8. "An example of a

² That Rassi was not cited by the Examiner in a rejection of the claims during prosecution of the '350 patent does not help Petitioner here. As the Board has explained, "a rejection applying a reference that is later relied upon by a petitioner is not a prerequisite to a finding that such reference was already presented to the Office under § 325(d)." *Boragen, Inc. v. Syngenta Participations AG*, IPR2020-00124, Paper 16 at 21-22 (PTAB May 5, 2020).

material error may include misapprehending or overlooking specific teachings of the relevant prior art *where those teachings impact patentability of the challenged claims.*” *Id.* at 8 n.9 (emphasis added). “If reasonable minds can disagree regarding the purported treatment of the art or arguments, it cannot be said that the Office erred in a manner material to patentability.” *Id.* at 9. Thus, to be *material* to patentability, the reference not considered during prosecution must “*impact patentability*”—in other words, had the reference been cited, the patent’s outcome may have been different.

a. No material error when the references were disclosed or substantially similar to references disclosed during prosecution

Where, as here, the same or substantially overlapping disclosures were before the Patent Office, it is incumbent on the petitioner to offer a particularized explanation of how the Office erred. *See Google LLC v. Uniloc 2017 LLC*, IPR2019-01584, Paper 7 at 15 (PTAB Mar. 24, 2020) (“[T]here is an overlap in authorship/inventorship between the references here and the references in the two prior petitions, which makes even more important an explanation by Petitioner here of the distinction between references.”) (denying institution); *see also In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016) (affirming requirement for articulation of “specific reasoning, based on evidence of record”). Here, Petitioner has failed to carry its burden because it presents only conclusory

arguments regarding non-cumulativeness of the references As explained below, Petitioner's arguments are both incorrect and inadequate to carry its burden of showing material error.

Petitioner is wrong that Rassi was not “ever identified during prosecution” is incorrect for the reasons discussed above. *See* Petition at 83; *see also supra* § III.C.1.d. Further, a reference weighs in favor of denying institution under § 325(d) if it was “considered” by the Examiner any time during prosecution, including, for example, when disclosed via IDS. *See, e.g., Advanced Bionics*, Paper 6 at 7–8 (stating that previously presented art includes art cited in an IDS); *Fellowes*, Paper 11 at 7–8; *Ocado*, Paper 9 at 34–35. Because Rassi was before the Examiner, there can be no claim that the Office erred in a material manner by not considering Rassi.

As to Nam and StaMixCo, Petitioner's argument ignores *Advanced Bionics'* requirement to address whether art in the Petition is ***substantially similar to*** art and arguments that were before the Examiner. Such is the case here. As described above, Nam and StaMixCo are substantially similar to the art and arguments that were before the Examiner. *See supra* §§ III.C.1.a, III.C.1.c.

In short, Rassi was before the PTO, as was prior art substantially similar to Nam and StaMixCo, and Petitioner has failed to show an error on the part of Examiner in evaluating the asserted prior art. These *Becton*, *Dickinson* factors ((c) and (e)) weigh against a finding that Petitioner has shown the Office material erred.

b. Petitioner failed to present additional evidence warranting reconsideration of previously considered prior art or arguments

Petitioner has not presented any new evidence that warrants reconsideration of the same prior art, as contemplated by *Becton, Dickinson* factor (f). Petitioner's expert declaration is not enough; the declaration parrots arguments in the Petition and the expert fails to support his testimony with objective evidence. *See* Ex. RPI1005 (Declaration of Dr. Karl Englund); *see also NHK*, Paper 8 at 16–17 (“Although Dr. Bogy’s declaration was not before the Examiner, the declaration does not persuade us that we should reconsider Braunheim, the AAPA, or Petitioner’s arguments because the declaration is substantially similar to the Petition (i.e., contains the same arguments that we find substantially overlap the Examiner’s findings) and Dr. Bogy fails to support his testimony with objective evidence.” (footnote omitted)). Here, Petitioner has not alleged any material error and has therefore failed to meet its burden. Petitioner is also foreclosed from raising new arguments concerning this failure in a reply. *Koa Corp. v. Vishay Dale Elecs., LLC*, IPR2019-00201, Paper 30 at 77 (PTAB May 7, 2020) (“A reply that raises a new issue or belatedly presents evidence may not be considered.”).

The Board should therefore deny institution on Ground 1-2 because these Grounds are cumulative of prior art and arguments considered during the underlying

examination, and Petitioner has failed to show any material error on the part of the Office regarding such references.

D. Grounds 3-4 Rely on the Same or Substantially the Same Art and Arguments that were Considered by the Patent Office without Error

In Grounds 3-4, Petitioner relies on Non-Patent Literature, Zumbrunnen (Ex. RPI1012)—specifically, Zumbrunnen, D.A., “Chaotic Advection and Its Application to Extruding Micro- and Nanostructured Plastic Materials,” *Applied Plastics Engineering Handbook* (2011), 401–15—and Rassi (Ex. RPI1013).

Ground	Basis	Claims	Reference(s)
3	§ 103	1-4, 6, 9-12, and 15-24	Zumbrunnen
4	§ 103	5, 7-8, and 13-14	Zumbrunnen alone or in combination with Rassi

Zumbrunnen discloses “chaotic advection-based processing of plastics” which can be “used with existing polymer resins and is well suited to melt processing of shear-sensitive materials.” *See* Ex. RPI1012, Zumbrunnen, at 1. Zumbrunnen also mentions that “[p]lastics have also been produced with the appearance of realistic wood grains both inside and on surfaces of extrusions” *Id.* Rassi discloses “an extruded board” having a “realistic look similar to...natural wood.” *See* Ex. RPI1013, Rassi, at Abstract, 1:57-58. As detailed further below, prior art identical and/or similar to Zumbrunnen and Rassi, such as Piedboeuf, Sudano, and Rohatgi, were considered by the Examiner and Board during the

underlying prosecution. The Board should therefore exercise its discretion and deny institution on Grounds 3 and 4, as substantially similar arguments and references were considered by the Examiner, which Petitioner has not shown was in error.

1. Part 1 (*Becton, Dickinson* Factors (a), (b), (d)): the Examiner considered substantially the same art and/or arguments during prosecution

Grounds 3 and 4 rely on primary reference Zumbrunnen, alone or in combination with Rassi. As explained below, both of these references are identical or cumulative of references that were considered by the Examiner and Board during the underlying prosecution, making Grounds 3 and 4 insufficient.

a. Petitioner's obviousness arguments based on Zumbrunnen are cumulative of arguments considered during prosecution

Petitioner's arguments based on Zumbrunnen are cumulative of, and overlap with, the Examiner's reliance on references considered during prosecution of the '350 patent. Where a petitioner's prior art challenges, even if based on art not previously presented to the Office, "are similar" to the arguments "raised by the Examiner" during prosecution, discretionary denial is appropriate under § 325(d). *See Xilinx*, Paper 9 at 27; *see also supra* § III.C.1.a.

Here, Petitioner's obviousness arguments based on Zumbrunnen are the same as, and thus cumulative of, the Examiner's arguments regarding Piedboeuf (Ex. T2007). As discussed in detail above (*see supra* § III.C.1.a), the Examiner

cited Piedbouef during prosecution of the '350 patent in relation to the limitation “wherein a plurality of individual layers of the first and second sets of polymer layers alternate within the board and extend along a substantially uninterrupted curvilinear path originating proximate the first side of the board and terminating proximate to the second side of the board” from Claim 1. *See* Ex. T2006, Non-Final Office Action (July 13, 2018), at 6.

While the Examiner initially found that Piedbouef met this limitation, including through back-and-forth with the Patent Owner, the Board sided with Patent Owner and found that Piedbouef did *not* meet this Claim 1 limitation and that the Examiner’s rejection was based on impermissible hindsight. *See id.* at 6; *see also* Ex. T2013, Response to Office Action (Sept. 13, 2018), at 9; Ex. T2011, Decision on Appeal at 5–6. Specifically, the Board wrote that the Examiner failed to establish how Piedbouef’s products are equivalent to the natural wood-grained products disclosed in the '350 patent, “merely due to having multiple bands of color variation,” and likewise failed to establish why a person of ordinary skill would be motivated to use the process described by Piedbouef to create natural wood-grained products. *See* Ex. T2011, Decision on Appeal at 4–5. After the Board’s Decision, the Examiner conceded that Piedbouef did not “teach the simulated natural wood-grained polymer boards” taught by the '350 patent. *See* Ex. T2012, Notice of Allowability (Mar. 22, 2021), at 2.

Petitioner's arguments about Zumbrunnen are no different than the Examiner's argument about Piedboeuf's system, which was ultimately rejected by the Board. Like the Examiner during prosecution of the '350 patent, Petitioner here argues that Zumbrunnen teaches that, "[b]ecause of the nature of the extrusion process, and of Zumbrunnen's disclosure that its simulated 'wood grain patterns can be repeated' (i.e., remain unchanged) 'at intervals along an extrusion' (RPI1012, 413)," this means that "a POSITA would have also understood that the continuous, curved polymeric layers that can be seen on the 'second side' in annotated Fig. 22.12 would extend in a curved pattern along the width/second direction." See Petition at 67. Petitioner argues that the "*continuous, curvilinear nature of Zumbrunnen's alternating polymer layers can be more clearly seen in its examples* of 'infinite variety of simulated wood patterns.'" See *id.* (emphasis added).

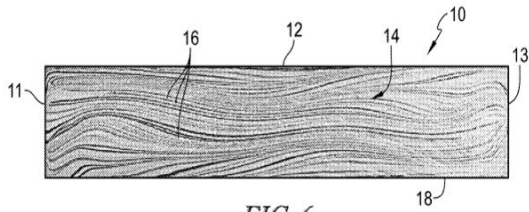


FIG. 6

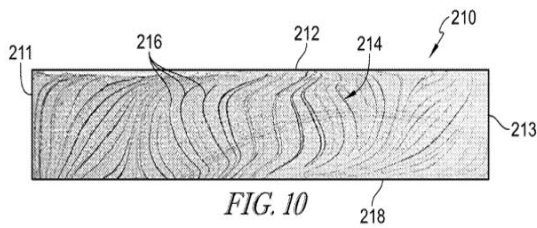
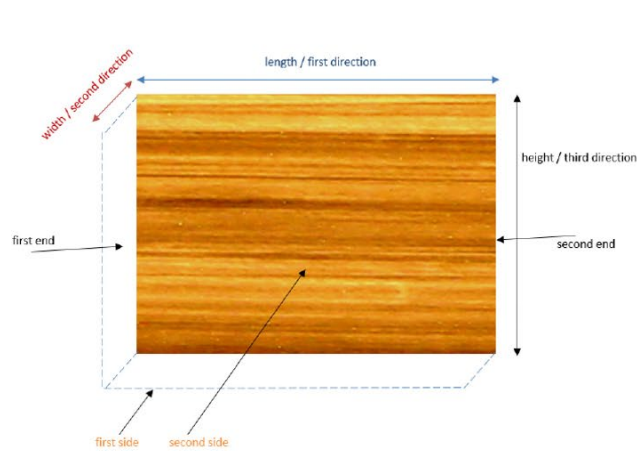


FIG. 10

'350 Patent



Zumbrunnen

Referring to FIGS. 6 and 9 of the '350 patent as well the figure from Zumbrunnen (Ex. RPI1012) reproduced above, the Petitioner, similar to the Examiner, simply states that “the continuous, curvilinear nature of Zumbrunnen’s alternating polymer layers can be more clearly seen in its examples” but does not actually provide any additional disclosure to how that is achieved such that the limitation of Claim 1 “and wherein a plurality of individual layers of the first and second sets of polymer layers alternate within the board and extend along a substantially uninterrupted curvilinear path originating proximate the first side of the board and terminating proximate to the second side of the board” is achieved. See Petition at 67. Further, in the '350 patent, the grains **16**, **216** extend “uninterrupted” and in a “curvilinear path” along the width of the substrates (between **11** and **13** in FIG. 6 and between **212** and **218** in FIG. 9). See Ex. RPI1001,

'350, at 7:21-35, 7:43-48. Referring to the Zumbrunnen figure cited by the Petitioner, which is reproduced above (*see also* Ex. RPI1012), there is no evidence that the grains of the substrate take an “uninterrupted” and “curvilinear path” in the length direction nor does the Petitioner present specific disclosure that the grains can take an “uninterrupted” and “curvilinear path” in the width direction. The Petitioner simply states that “a POSITA would have also understood that the continuous, curved polymeric layers that can be seen on the ‘second side’ in annotated Fig. 22.12 would extend in a curved pattern along the width/second direction. RPI1005, ¶185.” *See* Petition at 67. The Board has already found that this type of conclusory assertion from the Examiner was insufficient to establish Piedboeuf’s system did not teach the recited claim limitation. Therefore, the Examiner’s ultimate conclusion that the ’350 patent was allowable over Piedboeuf is equally applicable to Zumbrunnen, and the Board should find Petitioner’s same conclusory statement is similarly insufficient. *See also In re Magnum Oil Tools.*, 829 F.3d at 1380 (requiring Petitioners to provide “specific reasoning, based on evidence of record”).

Moreover, this already rejected line of reasoning further reveals that Petitioner has failed to make a *prima facie* showing that Zumbrunnen teaches the limitations of Claim 1. This reference—even in combination with Rassi, as

discussed in the following section—is not shown to teach all elements of Claim 1, meaning this petition should not be instituted.

b. Rassi is cumulative of art and arguments considered during prosecution

Petitioner relies on Rassi to argue the obviousness of claims 5, 7-8, 13-14, 16, 18, and 23 in combination with Zumbrunnen. Petitioner alleges that Rassi teaches “plastic lumber created through an extrusion process,” “creating plastic lumber ‘exhibiting a “natural” look like the look of grains in wood boards,’” and “creating plastic lumber where ‘the graining pattern extends into the core.’” *See* Petition at 53–54. However, as previously discussed, the Examiner already considered Rassi during prosecution of the ’350 patent. *See supra* § III.C.1.d; *see also* Ex. T2017, Examiner’s Search Strategy and Results (July 7, 2018).

2. Part 2 (*Becton, Dickinson* Factors (c), (e), (f)): Petitioner has not established that the Office materially erred

For each of Grounds 3-4 addressed above, Petitioner has not met its burden of showing the Office erred in a manner material to patentability in concluding the non-obviousness of the claims. *Advanced Bionics*, Paper 6 at 8. To be a material error, the Examiner must have misapprehended or overlooked relevant prior art that may “impact patentability of the challenged claims.” *Id.* at 8 n.9. Where, as here, the same or substantially overlapping disclosures were before the Patent Office, it is the petitioner’s burden to offer a particularized explanation of how the Office erred. *See*

Google, IPR2019-01584, Paper 7 at 15; *see also In re Magnum Oil Tools Int’l Ltd.*, 829 F.3d at 1380. Petitioner has not met this burden.

a. No material error when the references were disclosed or substantially similar to references disclosed during prosecution

First and as discussed *supra* § III.C.2.a, Petitioner’s argument that Rassi was not “ever identified during prosecution” is incorrect. *See* Petition at 83. A reference weighs in favor of denying institution under § 325(d) if it was “considered” by the Examiner any time during prosecution. *See, e.g., Advanced Bionics*, Paper 6 at 7–8 (stating that previously presented art includes art cited in an IDS); *Fellowes*, Paper 11 at 7–8; *Ocado*, Paper 9 at 34–35. Because Rassi was before the Examiner, there can be no claim that the Office erred in a material manner by not considering it.

Second and as to Zumbrunnen, Petitioner’s argument disregards *Advanced Bionics*’ requirement to address whether art in the Petition is ***substantially similar to*** art and arguments that were before the Examiner. Such is the case here. As described above, Zumbrunnen (as with Nam) is substantially similar to the art and arguments that were before the Examiner. Therefore, Petitioner has not satisfied *Becton*, *Dickinson* factors (c) and (e), because the materials and arguments (or substantially similar ones) were considered by the Examiner, which Petitioner has not shown was in error.

b. Petitioner failed to present additional evidence warranting reconsideration of previously considered prior art or arguments

Nor does the Petition present new evidence that warrants reconsideration of the same prior art. Petitioner relies on its expert's declaration, but this is insufficient. The declaration echoes arguments in the Petition, devoid of additional objective evidence to support those arguments. *See* Ex. RPI1005 (Declaration of Dr. Karl Englund); *see also NHK*, Paper 8 at 16–17 (finding declaration to be “substantially similar to the Petition,” without additional evidence, and therefore did not necessitate reconsideration of prior art).

Here, Petitioner failed to meet its burden of showing material error and is therefore foreclosed from raising new arguments concerning error in a reply. *Koa Corp.*, IPR2019-00201, Paper 30 at 77 (“A reply that raises a new issue or belatedly presents evidence may not be considered.”).

IV. PETITIONER FAILS TO SHOW A REASONABLE LIKELIHOOD THAT ANY OF THE CLAIMS ARE OBVIOUS

Separately, the Petition also fails to meet the substantive threshold for institution because Petitioner fails to show a reasonable likelihood that any of the claims are rendered obvious. Under 35 U.S.C. § 314(a), an *inter partes* review may not be instituted unless the petition “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); *Hulu, LLC v. Sound View Innovations, LLC*, IPR2018-

01039, Paper 29 at 13 (PTAB Dec. 20, 2019) (explaining that under § 314(a), “a petitioner is required to present evidence and arguments sufficient to show that it is reasonably likely that it will prevail in showing the unpatentability of the challenged claims”). The “reasonable likelihood” standard is “a higher standard than mere notice pleading.” *Hulu*, Paper 29 at 13. The petition must identify “*with particularity* the grounds for institution and evidence supporting such grounds.” *Id.* (emphasis original) (citing 35 U.S.C. § 312(a)). When there is no reasonable likelihood that the claims challenged in the petition are rendered obvious, such circumstances weigh in favor of the Board exercising its discretion under § 314(a) to deny institution. *See, e.g., Netscout Sys., Inc. v. Longhorn HD LLC*, IPR2021-01258, Paper 11 at 23–24 (PTAB Feb. 10, 2022) (exercising discretion to deny institution); *Sling TV L.L.C. v. Uniloc 2017 LLC*, IPR2019-01391, Paper 7 at 25–27 (PTAB Feb. 25, 2020) (same); *Google LLC v. Jawbone Innovations, LLC*, IPR2022-00888, Paper 12 at 38–40 (PTAB Nov. 28, 2022) (same).

V. PETITIONER FAILS TO ADDRESS PROPOSED CLAIM CONSTRUCTIONS FROM THE DISTRICT COURT PROCEEDING

Finally, the Board should deny institution of Grounds 1-4 because Petitioner failed to address how the petitioned claims should be properly construed. Under 37 C.F.R. §§ 42.104(b)(3), (b)(4), a petition is required to identify “[h]ow the challenged claim is to be construed” and “[h]ow the construed claim is

unpatentable[.]” When a petitioner fails to comply with this obligation, the Board may deny institution. *See, e.g., Volkswagen Grp. of Am., Inc. v. Mich. Motor Techs. LLC*, IPR2020-00229, Paper 13 at 9–10 (PTAB July 6, 2020); *Panasonic Corp. v. Optical Devices, LLC*, IPR2014-00302, Paper 9 at 7–9 (PTAB July 11, 2014); *BioDelivery Scis. Int’l, Inc. v. MonoSol Rx, LLC*, IPR2014-00794, Paper 7 at 5–6 (PTAB Nov. 5, 2014).

In related district court litigation between Petitioner and Patent Owner, Petitioner first argued that that the term “substantially uninterrupted” (for example, in Claim 1 of the ’350 patent) is subjective and indefinite. *See* Ex. T2018, *Tangent Techs. LLC v. Recycled Plastics Indus., LLC*, No. 1:23-cv-00261-WCG, D.I. 66, Claim Construction Order (July 24, 2024), at 8. The Petitioner, in district court, further argued that the ’350 patent provides no “objective criteria for determining how many interruptions the claimed curvilinear paths may have along their length to be considered ‘substantially interrupted’.” *Id.* The Petitioner, in district court and in the Petition, did not identify how the challenged claim is to be construed, fails to address whether the prior art meets Petitioner’s proposed construction, and fails to explain why Petitioner chose not to advocate for the same proposed construction before the Patent Office in this preliminary proceeding.

The Board has denied institution in similar situations where a Petitioner took inconsistent positions on claim construction without addressing the inconsistency.

Orthopediatrics Corp. v. K2M, Inc., IPR2018-01548, Paper 9 at 10–11 (PTAB Mar. 1, 2019) (“Because of the unique circumstances of this proceeding, where Petitioner advocated for a different claim construction in the related district court litigation, we determine that construction of the claim terms in dispute is necessary for the resolution of issues before us. Lacking such claim construction, the Petition fails to comply with 37 C.F.R. § 42.104(b)(3).”).

VI. CONCLUSION

To prevent any further waste of Board and Patent Owner resources, the Board should exercise its discretion to deny institution of *inter partes* review. Patent Owner respectfully reserves all of its arguments regarding why Petitioners’ invalidity proofs fail on the merits (including but not limited to: (i) the level of ordinary skill in the art, (ii) the state of the art, (iii) claim construction, and (iv) validity issues), and will present them if a Patent Owner Response becomes necessary.

Patent Owner Preliminary Response
IPR 2024-00898
Patent No. 10,981,350

Dated: August 30, 2024

Respectfully submitted,

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CERTIFICATE OF COMPLIANCE WITH WORD COUNT

I hereby certify that the foregoing **PATENT OWNER PRELIMINARY RESPONSE** contains 9,404 words, as measured by the word-processor used to prepare this paper and excluding words in the following sections: Cover Page, Table of Contents, Table of Authorities, List of Exhibits, Signature block, Certificate of Compliance with Word Count, and Certificate of Service.

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CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing **PATENT OWNER PRELIMINARY RESPONSE and Exhibits T2001-T2018** was served on August 30, 2024, via e-mail to counsel for Petitioners at the following:

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