

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FOX FACTORY, INC.,
Petitioner,

v.

SRAM, LLC,
Patent Owner.

IPR2024-00491
Patent 10,328,993 B2

Before MEREDITH C. PETRAVICK, HYUN J. JUNG, and
KEVIN W. CHERRY, *Administrative Patent Judges*.

JUNG, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. *Background and Summary*

FOX Factory, Inc. (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting institution of an *inter partes* review of claims 1–4, 6, 8, 10, 12, 14–18, 20, 22, 24, 26–29, 31, 33–38, 40, 42, 44, 46–49, 51, 53, and 56–64 of U.S. Patent No. 10,328,993 B2 (Ex. 1001, “the ’993 patent”). SRAM, LLC (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”). With our authorization, Petitioner filed a Reply to Patent Owner’s Preliminary Response (Paper 7, “Prelim. Reply”), and Patent Owner filed a Sur-Reply (Paper 9, “Prelim. Sur-reply”).

Under 35 U.S.C. § 314, an *inter partes* review may not be instituted “unless . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” Upon consideration of the Petition and for the reasons explained below, we determine that Petitioner has shown a reasonable likelihood of prevailing with respect to at least one of the challenged claims.

Thus, we institute an *inter partes* review of claims 1–4, 6, 8, 10, 12, 14–18, 20, 22, 24, 26–29, 31, 33–38, 40, 42, 44, 46–49, 51, 53, and 56–64 of the ’993 patent on all presented challenges. 37 C.F.R. § 42.108(a) (“When instituting . . . review, the Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.”); *see also SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018).

B. *Real Parties in Interest*

Petitioner identifies FOX Factory, Inc. and FOX Factory Holding Corp. as real parties in interest. Pet. 87. Patent Owner identifies itself as the real party in interest. Paper 4, 2.

C. Related Matters

The parties identify *SRAM, LLC v. FOX Factory, Inc.*, 1:23-cv-00492 (N.D. Ga.) as a related matter. Pet. 88; Paper 4, 2. Patent Owner also identifies IPR2024-00492. *Id.*

D. The '993 Patent (Ex. 1001)

The '993 patent issued on June 25, 2019 from an application filed on December 30, 2014. Ex. 1001, codes (22), (45). The '993 patent relates “particularly to bicycle steerer tubes.” *Id.* at 1:6–7. Figure 1 of the '993 patent is below reproduced.

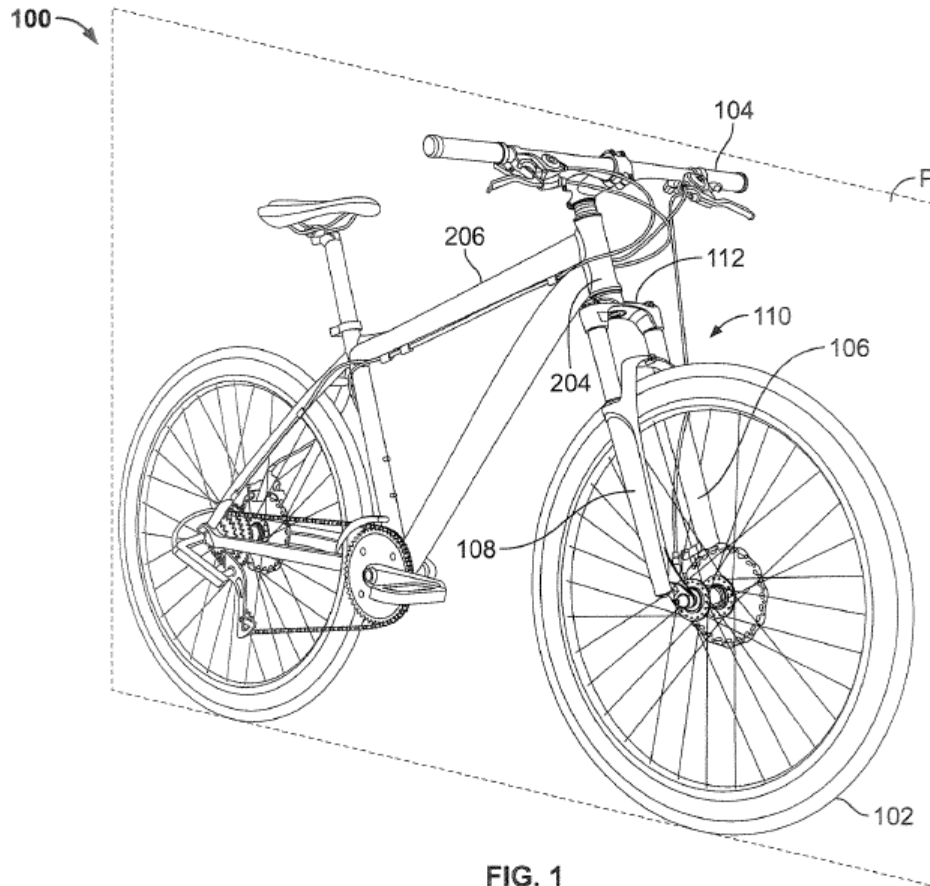


FIG. 1

Figure 1 shows “a perspective view of a representative bicycle.” Ex. 1001, 2:16. Bicycle 100 includes fork 110 that links front wheel 102 and rider-operated handlebar 104. *Id.* at 1:8–12. Bicycle 100 “is steered by

varying the plane of its front wheel 102 out of a plane of travel P, which is aligned with the running direction of the bicycle.” *Id.* at 1:8–11. Figures 6, 9, and 10 of the ’993 patent are below reproduced.

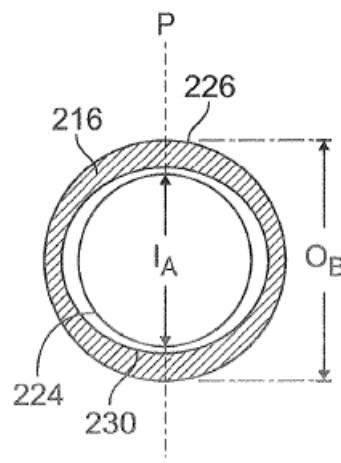
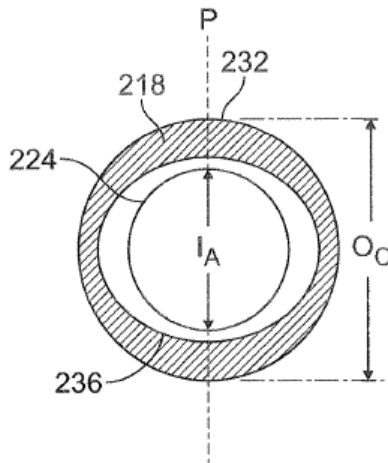
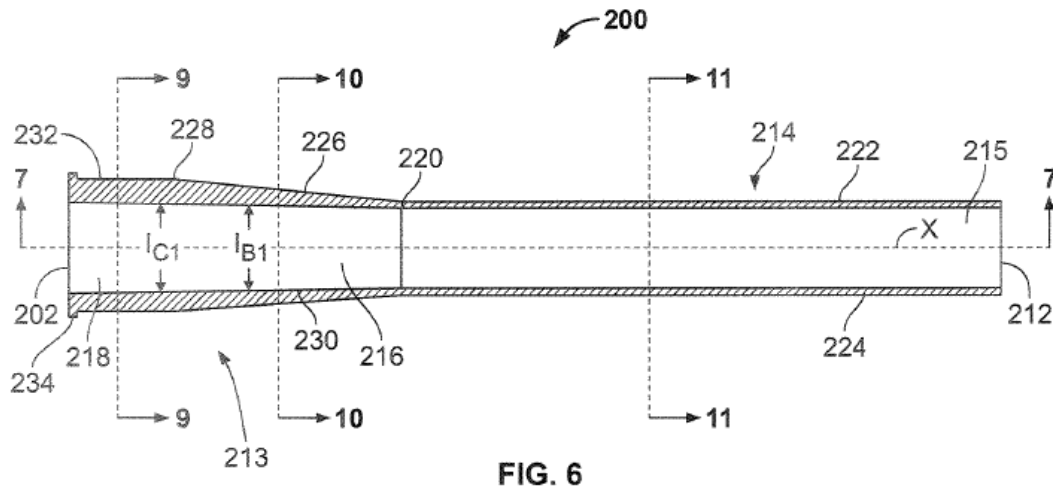


Figure 6 shows an axial sectional view of a bicycle fork that includes a steerer tube. Ex. 1001, 2:17–20, 2:28–29. Figures 9 and 10 are sectional views taken at lines 9-9 and 10-10 of Figure 6. *Id.* at 2:33–36.

According to the ’993 patent, “uniformly thick and stiff steerer tubes do not take into account the differences in loads on the steerer tube and stability, comfort and steering requirements.” Ex. 1001, 1:39–42. “[S]teerer tube 200 is particularly advantageous as used with a mountain bike, as the

steerer tube stiffness within the plane of travel P ideally is enhanced relative to its stiffness orthogonal to plane P.” *Id.* at 3:29–32.

Steerer tube 200 has lower section 213 and upper section 214.

Ex. 1001, 3:33–34. Segment 215 of upper section 214 is adapted to be joined to handlebar 104. *Id.* at 3:38–39. Lower section 213 has lower portion 218 and upper portion 216. Ex. 1001, 3:34–36. Outer surface 226 of upper portion 216 is frustoconical. *Id.* at 3:55–56.

“[I]nner surface 230 of upper portion 216 has a shape which changes as a function of the distance from upper end 220.” Ex. 1001, 4:5–7. “At upper end 220, the inner surface 230 is circular in cross section” and “towards upper portion lower end 228, the cross section becomes more and more elliptical.” *Id.* at 4:7–10. “[L]ower portion 218 has an inner surface 236 which continues to change cross-sectional shape as one proceeds to tube end 202.” *Id.* at 4:37–39.

E. Illustrative Claim

The ’993 patent includes 65 claims, of which Petitioner challenges claims 1–4, 6, 8, 10, 12, 14–18, 20, 22, 24, 26–29, 31, 33–38, 40, 42, 44, 46–49, 51, 53, and 56–64. Of the challenged claims, claims 1, 61, and 64 are independent, and below reproduced is claim 1.

1. A steering tube for a bicycle, the steerer tube comprising:
 - an elongate hollow body arranged around a steering axis located in a vertical plane of travel of the bicycle,
 - the body having upper and lower sections, a segment of the upper section adapted to be joined to a bicycle handlebar, a segment of the lower section adapted to be joined to a crown of a front wheel fork of the bicycle, the lower section joined to the upper section, and outer surfaces of the upper and lower

sections of the body being circular in cross section,
and

the body formed by a wall, a thickness of the wall at any point in the lower section of the body varying as a function of the cross-sectional angle of the point relative to the plane of travel, the wall thickness being at a maximum in the plane of travel of the bicycle.

Ex. 1001, 8:5–19.

F. Asserted Prior Art and Proffered Testimonial Evidence

Petitioner identifies the following references as prior art in the asserted grounds of unpatentability:

Name	Reference	Exhibit
Schroeder	US 7,503,576, issued Mar. 17, 2009	1010
Moechnig	US 2010/0259028 A1, published Oct. 14, 2010	1008
Valat	GB 287,452, issued Aug. 9, 1928	1007
Denk	DE 196 29 740 A1, published Jan. 29, 1998	1006 ¹

Petitioner contends that the above references are prior art under § 102(a)(2).

Pet. 1. Petitioner also provides a Declaration of Alexander Slocum Ph.D. (Ex. 1003).

¹ Like Petitioner, we cite to the translation of Denk (Ex. 1006) instead of the original publication of Denk (Ex. 1007).

G. Asserted Grounds

Petitioner asserts that claims 1–4, 6, 8, 10, 12, 14–18, 20, 22, 24, 26–29, 31, 33–38, 40, 42, 44, 46–49, 51, 53, and 56–64 are unpatentable on the following grounds:

Claims Challenged	35 U.S.C. §	References/Basis
1–4, 6, 8, 10, 12, 14–18, 20, 22, 24, 26–29, 33–38, 40, 42, 44, 46–49, 53, 56–63	103	Denk, Moechnig
31, 51, 64	103	Denk, Moechnig, Schroeder
1–4, 6, 8, 10, 12, 14–18, 20, 22, 24, 26–29, 33–38, 40, 42, 44, 46–49, 53, 56–63	103	Valat, Moechnig, Denk
31, 51, 64	103	Valat, Moechnig, Denk, Schroeder

Pet. 2.

II. 35 U.S.C. § 314(a)

As noted above in Section I.C., the parties identify a related matter in the U.S. district court for the Northern District of Georgia. Pet. 87–88; Paper 4, 2. Petitioner argues that discretionary denial under *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) (precedential) (“*Fintiv*”) is not warranted. Pet. 86–87; Prelim. Reply 1–10. Patent Owner responds that all the factors favor denying institution. Prelim. Resp. 32–41; Prelim. Sur-reply 1–10.

Fintiv instructs us to consider whether to deny institution in certain circumstances when there is parallel district court litigation, upon consideration of six factors:

1. whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted;
2. proximity of the court's trial date to the Board's projected statutory deadline for a final written decision;
3. investment in the parallel proceeding by the court and the parties;
4. overlap between issues raised in the petition and in the parallel proceeding;
5. whether the petitioner and the defendant in the parallel proceeding are the same party; and
6. other circumstances that impact the Board's exercise of discretion, including the merits.

Fintiv, Paper 11 at 6.

Our analysis of *Fintiv* is guided by the USPTO Director's Memorandum issued on June 21, 2022, titled "Interim Procedure for Discretionary Denials in AIA Post Grant Proceedings with Parallel District Court Litigation" ("Director's Memo"). We turn to the *Fintiv* factors.

A. Factor 1: Stay

According to the parties, a stay was granted in related litigation while a motion to transfer was being considered and then lifted when that motion was denied. Pet. 84–85; Prelim. Resp. 33–34; Prelim. Reply 1–2.

"Petitioner intends to request [another] stay if the Board institutes this IPR" because a stay would simplify the issues and improve efficiency in the related litigation. Prelim. Reply 1. Patent Owner argues that a second stay is unlikely to be granted. Prelim. Sur-reply 3. Petitioner replies that Patent Owner's argument is pure speculation and there no evidence that the related litigation will not be stayed again upon instituting this proceeding. Prelim. Reply 1–3.

Because the related litigation is not stayed and there is insufficient evidence that a stay may or may not be granted if trial is instituted, this factor is neutral.

B. Factor 2: Proximity to Trial Date

Petitioner argues that “there is no trial date scheduled.” Pet. 84; *see also* Prelim. Reply 3 (“No trial date has been set.”). Patent Owner agrees that “a trial date has not yet been set.” Prelim. Resp. 35. The parties dispute what the statistical time to trial should be and how to apply it in view of the stay that has been lifted in related litigation. Prelim. Resp. 35–36; Prelim. Reply 3–5; Prelim. Sur-reply 4–6.

Because no trial date has been set, this factor weighs heavily against exercising our discretion to deny institution.

C. Factor 3: Investment in Parallel Proceeding

Petitioner argues that “parties and the district court have made very little progress and investment in the case since its filing on February 1, 2023,” and that “[t]he parties have only exchanged preliminary infringement and invalidity contentions.” Pet. 84–85. Petitioner also argues that “[t]here has been no meaningful production of documents, or responses to document requests or interrogatories,” and “[c]laim construction has not started.” *Id.* at 85.

Patent Owner argues that “well over 6,000 pages of documents have been exchanged between the parties, preliminary infringement contentions, responses thereto, and preliminary invalidity contentions have all been served, and multiple sets of Interrogatories and Requests for Production have been served.” Prelim. Resp. 37. Patent Owner also argues that Petitioner filed the present Petition “on the day of its statutory deadline.” *Id.*

Petitioner replies that “parties have resumed fact discovery, but thus far no depositions of fact witnesses have been taken (and none are scheduled)” and “are still in the midst of negotiating a case schedule, and claim construction has not yet started.” Prelim. Reply 5 (citing Ex. 1021). Petitioner also replies that it did not “gain any tactical advantage by delaying filing.” *Id.* at 6.

In view of the minimal investment made by the parties and the court in parallel litigation, this factor also weighs against exercising our discretion to deny institution.

D. Factor 4: Overlap with Parallel Proceeding

Petitioner states that “there is some overlap in art and arguments between the invalidity contentions in the district court and the Petition (factor 4).” Pet. 85. Patent Owner argues that “there is significant overlap between the prior art and arguments asserted” in related litigation and this proceeding, and that “Petitioner has *not* stipulated that it will not pursue in the [related litigation] the same grounds asserted in the petition or any grounds that could have reasonably been raised in the petition.” Prelim. Resp. 39; *see also* Prelim. Sur-reply 6–7 (arguing similarly). This factor favors exercising our discretion to deny institution.

E. Factor 5: Whether Petitioner and Defendant are the Same Party

Both parties agree that Petitioner and defendant in related litigation are the same. Pet. 85; Prelim. Resp. 39. This factor favors exercising our discretion to deny institution.

F. Factor 6: Merits and Other Considerations

Petitioner argues that it “has presented compelling, meritorious challenges.” Pet. 85; *see also* Prelim. Reply 7–10 (arguing similarly). Patent Owner argues that Petitioner presents “weak grounds that lack many

essential limitations.” Prelim. Resp. 41; *see also* Prelim. Sur-reply 7–10 (arguing similarly).

As specified in the Director’s Memo, “compelling, meritorious challenges will be allowed to proceed at the PTAB even where district court litigation is proceeding in parallel,” and that the *Fintiv* analysis will not lead to discretionary denial if it can be established that a case presents compelling merits. Director’s Memo 4–5. Additionally, the Director clarified that “[t]he Board should first assess *Fintiv* factors 1–5; if that analysis supports discretionary denial, the Board should engage the compelling merits question.” *CommScope Techs. LLC v. Dali Wireless, Inc.*, IPR2022-01242, Paper 23 at 6 (PTAB Feb. 27, 2023) (precedential).

Because there is no trial date set and the minimal investment by the parties and the court in parallel litigation, we determine that, on balance, *Fintiv* factors 1–5 do not favor exercising our discretion to deny institution. Therefore, there is no need to determine whether the Petition establishes compelling merits.

G. Conclusion on Fintiv Factors

Based on a holistic analysis of the *Fintiv* factors taking into consideration “whether efficiency and integrity of the system are best served by denying or instituting review” (*Fintiv*, Paper 11 at 6), we decline to exercise our discretion under 35 U.S.C. § 314(a) to deny institution of *inter partes* review.

III. ANALYSIS

A. Legal Standards

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent [claim] it challenges is

unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016). This burden of persuasion never shifts to Patent Owner.

Dynamic Drinkware, LLC v. Nat’l Graphics, Inc., 800 F.3d 1375, 1378 (Fed. Cir. 2015). The Board may authorize an *inter partes* review if we determine that the information presented in the Petition shows that there is a reasonable likelihood that Petitioner will prevail with respect to at least one of the claims challenged in the petition. 35 U.S.C. § 314(a).

Petitioner contends that the challenged claims of the ’993 patent are unpatentable under § 103. Pet. 2. A claim is unpatentable under § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) where in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). When evaluating a combination of teachings, we must also “determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)). Whether a combination of elements produces a predictable result weighs in the ultimate determination of obviousness. *Id.* at 416–417.

B. Level of Ordinary Skill in the Art

Petitioner argues that a person of ordinary skill in the art

would have had (1) a Bachelor's degree in Mechanical Engineering or an equivalent degree, and 1-2 years of experience in design work related to optimal mechanical and structural design (e.g., minimizing weight while maximizing strength and stiffness for a particular type of loading) such as practiced, for example, in aerospace, bicycle, or machinery (such as robotics) industries; or (2) at least a Master's degree in Mechanical Engineering or an equivalent degree with a focus on design of mechanical elements and structures, and a good understanding of mechanical and structural design principles.

Pet. 8 (citing Ex. 1003 ¶ 23).

Patent Owner responds that a person of ordinary skill in the art would have been “more appropriately connected to, and consider[ed] the particularities of, vehicle component and like design.” Prelim. Resp. 11. Patent Owner contends that one of ordinary skill in the art would have had “a degree in Mechanical Engineering and approximately three years’ experience in vehicle component design and like technology, or a Master’s degree or higher in Mechanical Engineering with experience in design of vehicle components or like technology.” *Id.* Patent Owner also contends that “Petitioner’s generalist expert does not appear to meet these requirements.” *Id.*

Both parties’ proposal for the level of ordinary skill in the art are substantially the same. *See* Pet. 8; Prelim. Resp. 11. For example, both parties agree that an ordinarily skilled artisan would have, at least, a Bachelor’s degree in Mechanical Engineering with experience in bicycle or vehicle design “or like technology.” *See* Pet. 8; Prelim. Resp. 11. At this stage, any differences in the parties’ proposals do not affect our analysis.

Also, Petitioner’s declarant has a Ph.D. in Mechanical Engineering with “over 30 years of experience in teaching and directing research related to mechanical engineering and precision machine design.” Ex. 1003 ¶ 4. At

this stage, “precision machine design” is sufficiently “like technology,” as proposed by Patent Owner. Prelim. Resp. 11; Ex. 1003 ¶ 4; *see also id.* ¶ 10 (testifying that he is “very familiar with bicycle design and maintenance”). Therefore, we do not agree that Petitioner’s declarant has experience so “generalist” that it would affect the weight we give to his opinion.

Accordingly, based on the preliminary record, we adopt Petitioner’s asserted level of ordinary skill to determine whether there is a reasonable likelihood that Petitioner would prevail with respect to at least one of the claims challenged in the Petition.

C. Claim Construction

In an *inter partes* review, the claims are construed using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. [§] 282(b), including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.

37 C.F.R. § 42.100(b) (2021); *see Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc).

Petitioner states that “[n]o terms need construction to resolve the controversy in this forum.” Pet. 9 (citing Ex. 1003 ¶ 30). “Patent Owner agrees that the ‘993 Patent’s claim terms require no special claim construction for purposes of denying this Petition.” Prelim. Resp. 11.

At this preliminary stage, we determine that express claim interpretation is not necessary to determine whether Petitioner shows a reasonable likelihood of prevailing. *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms that . . . are in controversy, and only to the extent necessary to resolve

the controversy.”) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

D. Asserted Obviousness Based on Denk and Moechnig

1. Denk (Ex. 1006)

Denk’s “lightweight component . . . , at least in part, has an essentially tubular body with a defined outer cross-sectional contour and a defined inner cross-sectional contour.” Ex. 1006, code (54). “[T]he inner cross-sectional contour and the outer cross-sectional contour of the component are designed in such a way that the change in the wall thickness along the cross section takes place essentially continually.” *Id.*; *see also id.* at col. 3 (describing that “the change in the contour of the outer and/or inner cross section takes place continually” and “the lightweight component . . . may also have a change in the wall thickness along its length”).

“One particularly important field of application of lightweight components is bicycle construction.” Ex. 1006, col. 1. According to Denk, “particularly high loads occur in the vertical plane of the frame, since the weight of the rider acts essentially in the vertical direction, and the impact loads acting on the front and rear wheel likewise essentially occur within a vertical plane.” *Id.* at col. 2. Denk “allows the cross section of the tubular portion of the lightweight component to be designed in such a way that the force absorption capability of the components of a bicycle frame in the vertical frame direction is greater than in an arbitrary orientation perpendicular to this plane.” *Id.*

“A circular ring-shaped outer cross-sectional contour is to be preferred for visual and possibly also technical reasons, resulting in a lightweight component in which the different wall thickness distribution is defined by the inner cross-sectional contour.” Ex. 1006, col. 3. Denk’s

“lightweight component for bicycles is suitable for practically all tubular components, i.e., top tube, down tube, seat tube, head tube, fork tubes, rear wheel stay, seat posts, handlebars, handlebar stem, and the like.” *Id.* at col. 4.

Figures 1a and 1l are below reproduced.

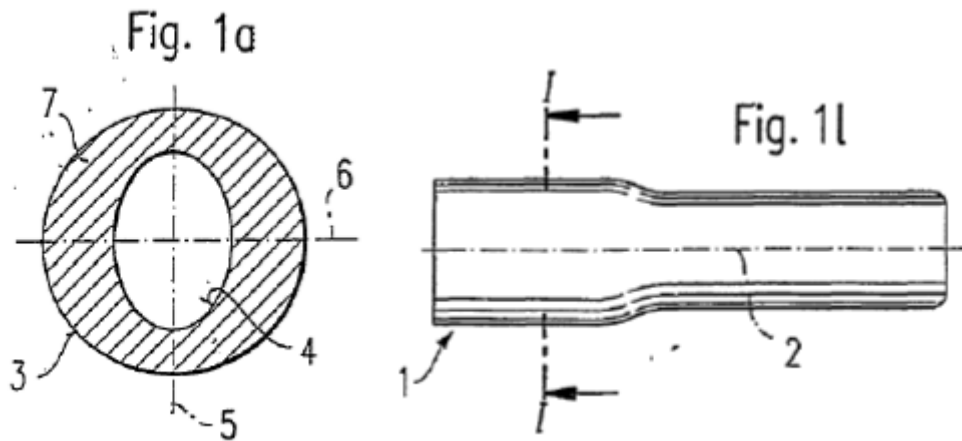


Figure 1a “shows a cross section 2 of a tube having a circular outer cross-sectional contour 3 and an elliptical inner cross-sectional contour 4 that is arranged symmetrically with respect to a center line or center plane 5,” and Figure 1l shows elongated tube 1 that “extends symmetrically with respect to a straight center line 2.” Ex. 1006, cols. 5, 6. In the embodiment of Figure 1a, “the highest strength and rigidity values occur in a plane that is directed perpendicularly with respect to a line 6 and that perpendicularly intersects the plane of symmetry 5.” *Id.* at col. 6.

2. Moechnig (Ex. 1008)

Moechnig relates “particularly, to a lightweight steerer tube.”

Ex. 1008 ¶ 1. According to Moechnig, “it would be desirable to have a steerer assembly with improved lateral and fore and aft stiffness performance” and that “is robust and lightweight.” *Id.* ¶ 9. Reproduced below is Figure 1 of Moechnig.

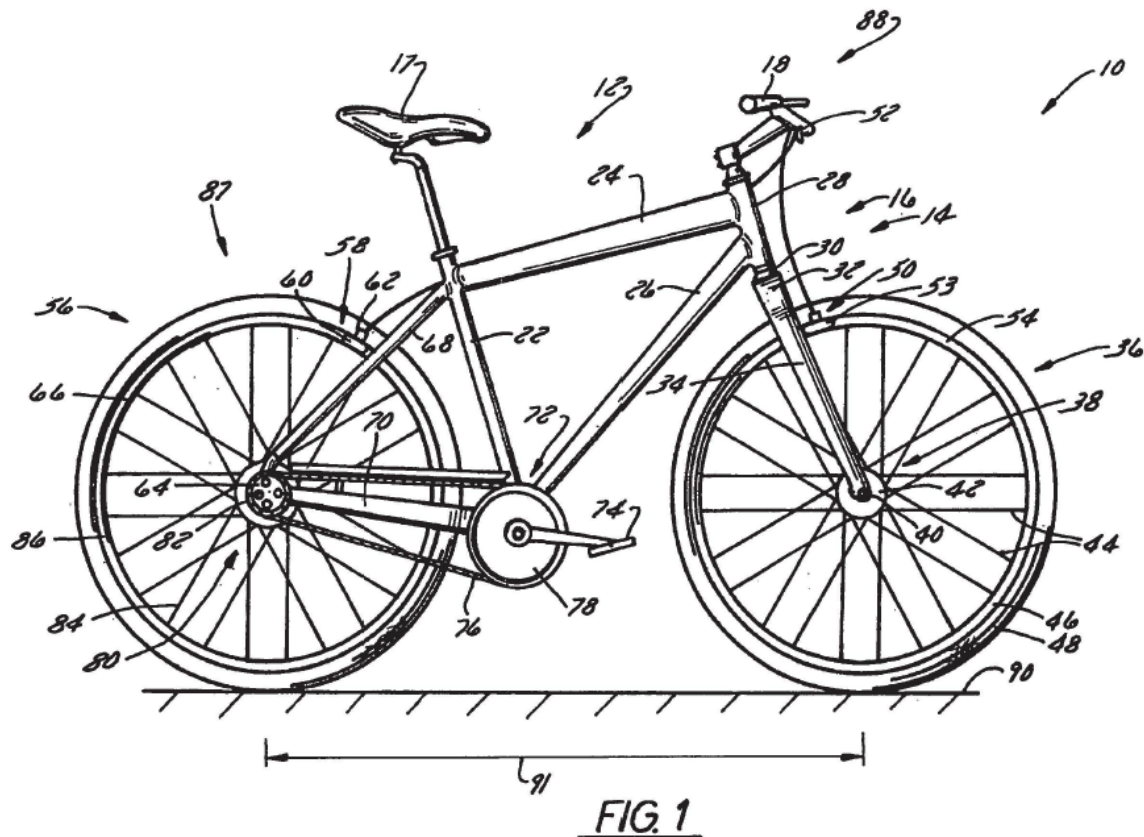


Figure 1 shows an elevational view of a bicycle with Moechnig's steerer assembly. Ex. 1008 ¶ 17. "Fork assembly 14 is supported by a steerer assembly 16" of Moechnig. *Id.* ¶ 25. "[H]andlebar 18 is positioned forward of seat 17 and is connected to steerer assembly 16 such that rotation of handlebar 18 rotates steerer assembly 16 relative to frame 12." ¶ 26.

"Steerer tube 30 includes an optional cavity 206 formed in body 100." Ex. 1008 ¶ 45. "Optional cavity 206 can extend a majority of the length of steerer tube 30 and provides a lighter steerer assembly 16." *Id.* "Such a construction forms a steerer tube wall 208 that has a thickness that is selected . . . to withstand the loaded interaction between steerer tube 30 and head tube 28." *Id.*

"Decreasing the fore-aft stiffness of the steerer assembly 16 provides two distinct advantages," with one being "a decrease in the amount of force

that is transmitted to the rider” and the other being “the distribution of the load associated with . . . frontal impacts over a greater duration of an impact or deflection event.” Ex. 1008 ¶ 49. “Accordingly, steerer assembly 16 can be constructed in a lightweight manner capable of withstanding the fore and aft impact loading as compared to heavier steerer assemblies or constructed to provide greater fore and aft impact performance as compared to steerer assemblies of comparable weight.” *Id.*

3. *Independent Claim 1*

Petitioner argues that, to the extent the preamble is limiting, it would have been obvious to use Denk’s tubular component as “[a] steerer tube for a bicycle.” Pet. 16 (citing Ex. 1003 ¶¶ 57, 63; Ex. 1006, cols. 1, 4; Ex. 1008 ¶¶ 1, 9, 49).

For “an elongate hollow body arranged around a steering axis located in a vertical plane of travel of the bicycle,” Petitioner argues that Denk discloses, and would have been understood to be, “an elongate hollow body.” Pet. 16–17 (citing Ex. 1003 ¶¶ 65; Ex. 1006, code (54), cols. 5, 6, Figs. 1a, 11); *see also id.* at viii (labeling the limitation “1[a]”). Petitioner also argues that, when mounted on Moechnig’s bicycle, Denk’s longitudinal axis would be arranged around “a steering axis” and “in a vertical plane of travel.” *Id.* at 17–19 (citing Ex. 1003 ¶¶ 66–72; Ex. 1006, col. 5; Figs. 1a, 11; Ex. 1008 ¶¶ 35, 45, Fig. 2–4).

For “the body having upper and lower sections, . . . the lower section joined to the upper section,” Petitioner argues that Denk’s tubular component 1 has two joined sections. Pet. 19–20 (citing Ex. 1003 ¶ 73; Ex. 1006, Fig. 11); *see also id.* at viii (labeling the limitation “1[b]”). Petitioner also argues that, for “a segment of the upper section adapted to be joined to a bicycle handlebar, a segment of the lower section adapted to be

joined to a crown of a front wheel fork of the bicycle,” when implemented in Moechnig, Denk’s larger outer contour would have been used as the lower section for the fork and the other section would have been used for joining to a handlebar. *Id.* at 20–21 (citing Ex. 1003 ¶¶ 74–80; Ex. 1006, col. 3; Ex. 1007, 1:44–51; Ex. 1008 ¶¶ 1, 2, 26, 27, Figs. 1–3).

For “outer surfaces of the upper and lower sections of the body being circular in cross section,” Petitioner argues that Denk discloses the limitation. Pet. 22 (citing Ex. 1003 ¶¶ 81–82; Ex. 1006, code (54), cols. 3, 6, Figs. 1a, 1l); *see also id.* at viii (labeling the limitation “1[c]”). Petitioner also argues that it would have been obvious that both sections of Denk are circular in cross-section and one of ordinary skill in the art “would have known how to shape a circular outer cross-sectional contour throughout the tube length based on teachings in Denk.” *Id.* at 22–23 (citing Ex. 1003 ¶¶ 81–86).

For “the body formed by a wall, a thickness of the wall at any point in the lower section of the body varying as a function of the cross-sectional angle of the point relative to the plane of travel, the wall thickness being at a maximum in the plane of travel of the bicycle,” Petitioner argues that Denk’s elliptical inner cross-sectional contour 4 and circular outer cross-sectional contour 3 would have a varying wall thickness and a maximum thickness at plane 6. Pet. 23–25 (citing Ex. 1003 ¶¶ 46, 87–88; Ex. 1006, cols. 2, 6, Figs. 1a, 1l); *see also id.* at viii (labeling the limitation “1[d]”). According to Petitioner, one of ordinary skill in the art “would have found it obvious to align plane 6 of Denk’s tube 1, which has the maximum wall thickness, with the plane of travel.” *Id.* at 25 (citing Ex. 1003 ¶¶ 89–92).

a) Petitioner's Asserted Reason for Combining

According to Petitioner, one of ordinary skill in the art “would have found it obvious to use Denk’s lightweight component as a bicycle steerer tube and would have implemented it in a conventional manner.” Pet. 13 (citing 1003 ¶¶ 55, 56; Ex. 1006, code (54), cols. 1, 4); *see also id.* at 14 (arguing it was known how to use Denk as a steerer tube) (citing Ex. 1001, 1:19–33; Ex. 1003 ¶ 58). Petitioner argues that the ordinarily skilled artisan “would have been motivated to use Denk’s lightweight component as a bicycle steerer tube to have the advantages of improved mechanical strength and reduced weight,” as disclosed in Denk and known in the art. *Id.* at 13–14 (citing Ex. 1006, cols. 1–2; Ex. 1007, 1:10–14; Ex. 1010, 6:22–26).

Petitioner also argues that lighter weight and added reinforcement were desirable. Pet. 14 (citing Ex. 1003 ¶ 57; Ex. 1006, cols. 1–2), 15 (citing Ex. 1003 ¶ 59; Ex. 1006, col. 3; Ex. 1007, 1:44–51). Petitioner further argues that the proposed combination would have been combining known elements according to their established functions to yield predictable results and that there would have been a reasonable expectation of success in making the proposed combination. *Id.* at 15–16 (citing Ex. 1003 ¶¶ 60–61; Ex. 1006, col. 3; Ex. 1008 ¶ 2; Ex. 1010, code (57)).

b) Petitioner Shows a Reasonable Likelihood of Prevailing

Based on the preliminary record, Petitioner sufficiently shows that its proposed combination teaches or suggests the limitations of claim 1 and that one of ordinary skill in the art would have combined Denk and Moechnig in the manner asserted with a reasonable expectation of success.

Patent Owner responds that Denk relates to improvements for a bicycle frame, is not concerned with issues related to a steerer tube, and does not disclose or suggest using its bicycle frame as a steerer tube. Prelim.

Resp. 12–16 (citing Ex. 1001, 2:4–9, 7:57–62, 8:5–19, 11:45–12:13, 12:26–43; Ex. 1006, cols. 1, 2, Figs. 2a–2c). Petitioner, however, argues that “Denk discloses that its lightweight component is suitable for all tubular components of a bicycle frame.” Pet. 13. As pointed out by Petitioner, Denk expressly states its “lightweight component for bicycles is suitable for practically all tubular components, i.e., top tube, down tube, seat tube, head tube, fork tubes, rear wheel stay, seat posts, handlebars, handlebar stem, and the like.” *Id.*; Ex. 1006, col. 4. At this stage, Petitioner sufficiently shows that Denk’s tubule component would have been used as a steerer tube. *See* Pet. 13–14, 18–19.

Patent Owner also responds that Moechnig was considered during prosecution and overcome, is directed to a different tubing structure, and has the opposite goal of reducing fore and aft stiffness. Prelim. Resp. 16–19 (citing Ex. 1002, 185–187, 210–218; Ex. 1008 ¶¶ 9, 49, 50, Figs. 4–6). Patent Owner further responds that Moechnig does not provide a motivation for using a steerer tube with Denk’s construction, and Petitioner’s reason for combining is based on hindsight because the cited references teach a bicycle frame and strengthening in a direction different from the ’993 patent. *Id.* at 19–20 (citing Pet. 13–14; Ex. 1005, Fig. 2a). According to Patent Owner, Petitioner speculates that Denk would have reduced weight and ignores Moechnig’s teaching to be more rigid in a lateral direction. *Id.* at 20. Patent Owner, thus, contends that no cited reference discloses or suggests maximum stiffness and thickness in the direction of the bicycle’s travel. *Id.* at 21 (citing Ex. 1008 ¶¶ 9, 49, 50).

Petitioner’s challenge is based on Denk applied to Moechnig, unlike during prosecution, when Moechnig alone was applied. *See* Ex. 1002, 210–218. Petitioner also cites an express teaching in Denk to use its lightweight

component for any tubular component of a bicycle. Pet. 13; Ex. 1006, col. 4. Petitioner further argues that, because maximum loads are in the plane of travel, Denk's maximum wall thickness would have been aligned with the plane of travel to improve the strength of the tube. *See* Pet. 15–16, 25–26. At this stage, Petitioner provides sufficient argument and evidence for orienting Denk's maximum wall thickness in the plane of travel. *See id.* This issue would benefit from additional development during trial.

For the reasons above and on the preliminary record, Petitioner shows a reasonable likelihood of prevailing in its challenge to claim 1.

4. Remaining Challenged Claims

Claims 2–4, 6, 8, 10, 12, 14–18, 20, 22, 24, 26–29, 33–38, 40, 42, 44, 46–49, 53, and 56–60 ultimately depend from claim 1. Petitioner argues with citations to the record that Denk and Moechnig would have rendered obvious these dependent claims. Pet. 28–45. Patent Owner responds with the same arguments described above for claim 1. *See* Prelim. Resp. 12–21.

Petitioner also argues with citations to the record that Denk and Moechnig would have rendered obvious independent claim 61 and its dependent claims 62 and 63. Pet. 26–28, 32–33. Patent Owner responds with the same arguments summarized above for claim 1. *See* Prelim. Resp. 12–21.

For the reasons above and on the preliminary record, Petitioner shows a reasonable likelihood of prevailing in its challenge to these claims.

E. Asserted Obviousness Based on Denk, Moechnig, and Schroeder

1. Schroeder (Ex. 1010)

Schroeder relates to “an improved combination for a steering tube and crown which is used as part of a bicycle fork . . . assembly” and “a molded

assembly for a unique combination of a steering tube and crown for use in a two vehicle fork such as a bicycle fork.” Ex. 1010, 1:11–13, 4:8–12.

According to Schroeder, “if a bicycle fork assembly is comprised of a steering tube made of resin having carbon fiber composites molded into a crown made of aluminum, the bicycle fork will possess[] a better durability and shock absorbing capabilities.” Ex. 1010, 4:22–26. Schroeder’s steering tube 10 has thick tube wall section 26, thin tube wall section 28, and section 29 “where the tube is gradually decreased.” *Id.* at 6:15–26, Fig. 2.

2. *Dependent Claims 31, 51, and 64*

Claim 1 and independent claim 64 recite substantially similar limitations. *Compare* Ex. 1001, 8:5–19 *with, id.* at 12:26–44. Independent claim 64 additionally recites “the segment of the lower section of the body is joined to the crown of the front wheel fork, the body formed of a material different from the crown of the front wheel fork.” *Id.* at 12:34–38.

Claims 31 and 51 ultimately depend from claim 1, and both recite “wherein the segment of the lower section of the body is joined to the crown of the front wheel fork, the body formed of a material different from the crown of the front wheel fork.” Ex. 1001, 9:64–67, 11:11–14.

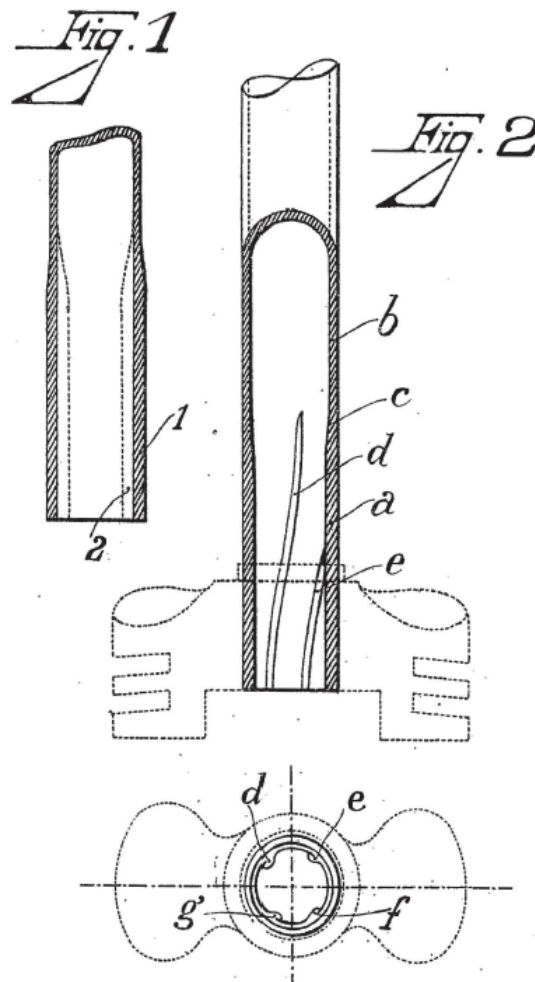
Petitioner argues with citations to the record that Schroeder teaches the above-quoted limitations of claims 31, 51, and 64. Pet. 48–49. Petitioner also argues that one of ordinary skill in the art would have combined the references in the manner asserted. *Id.* at 47–48. Patent Owner responds with the same arguments summarized above for claim 1. *See* Prelim. Resp. 12–21.

For the reasons above and on the preliminary record, Petitioner shows a reasonable likelihood of prevailing in its challenge to claims 31, 51, and 64.

F. Asserted Obviousness Based on Valat, Moechnig, and Denk

1. Valat (Ex. 1007)

Valat's "tubes are provided with solid internal ribs or reinforcements by the swaging process so that a continuous external surface is produced," with the reinforcements being "confined to those parts which are subjected to shear when in use." Ex. 1007, 1:35–43. Valat states that "[a]mong the parts of a bicycle . . . most dangerously loaded the steering tube may be cited, particularly on its perimeter at entry to the fork bridge." *Id.* at 1:44–48. Figures 1 and 2 of Valat are below reproduced.



"Figure 1 shows an axial section of the tube before reinforcements are formed," and "Figure 2 shows the finished tube mounted on a fork bridge."

Ex. 1007, 1:58–63. The “tube which has the same external diameter over its whole length” and “generally has a greater thickness *a* at its lower end, where the loads are greatest, than in the upper part *b*.” *Id.* at 1:72–77. Valat “giv[es] this tube in its lowest part interior reinforcements such as *d e f g* which can be straight and parallel with the axis of the tube, or . . . along a helix of very long pitch and having the same axis as the tube itself.” *Id.* at 1:79–85.

2. Independent Claim 1

Petitioner argues that Valat and Moechnig each discloses “[a] steerer tube for a bicycle.” Pet. 55–56 (citing Ex. 1003 ¶¶ 161–162; Ex. 1007, 1:44–63, Figs. 1, 2; Ex. 1008, codes (54), (57), ¶ 1)

For “an elongate hollow body arranged around a steering axis located in a vertical plane of travel of the bicycle,” Petitioner argues that Valat discloses “an elongate hollow body,” and that one of ordinary skill in the art would have understood it is “arranged around a steering axis” in the direction of bicycle travel. Pet. 56–58 (citing Ex. 1003 ¶¶ 164–166; Ex. 1007, 1:22–26, 1:70–78, 1:86–90, 2:22–25, Figs. 1, 2). Petitioner also argues that Moechnig discloses the limitation. *Id.* at 58 (citing Ex. 1003 ¶¶ 167–171).

According to Petitioner, Valat discloses “the body having upper and lower sections, a segment of the upper section adapted to be joined to a bicycle handlebar, a segment of the lower section adapted to be joined to a crown of a front wheel fork of the bicycle, the lower section joined to the upper section.” Pet. 58–60 (citing Ex. 1003 ¶¶ 173–175; Ex. 1007, 1:44–51, 1:61–63, 1:70–78, Figs. 1, 2). Petitioner also argues that Moechnig discloses the limitation. *Id.* at 60–61 (citing Ex. 1003 ¶¶ 176–180; Ex. 1008 ¶¶ 2, 26, 27, Figs. 1–3)

For “outer surfaces of the upper and lower sections of the body being circular in cross section,” Petitioner argues that one of ordinary skill in the art would have understood that Valat discloses the limitation. Pet. 61–63 (citing Ex. 1003 ¶¶ 181–183; Ex. 1007, 1:70–90, 1:102–105, Figs. 1–5).

For “the body formed by a wall, a thickness of the wall at any point in the lower section of the body varying as a function of the cross-sectional angle of the point relative to the plane of travel,” Petitioner argues that Valat would have been understood to disclose the limitation. Pet. 64–66 (citing Ex. 1003 ¶¶ 185–189; Ex. 1007, 1:35–43, 1:70–78, 1:86–90, 1:102–105, Figs. 1–5). Petitioner also argues that Valat modified by Denk would have “the wall thickness being at a maximum in the plane of travel of the bicycle.” *Id.* at 66–68 (citing Ex. 1003 ¶¶ 188, 189; Ex. 1006, cols. 1, 2, 9, Fig. 1a; Ex. 1007, Fig. 1; Ex. 1008, Fig. 1).

a) Petitioner’s Asserted Reason for Combining

Petitioner argues that it would have been obvious to mount Valat’s steerer tube on a bicycle, such as the one disclosed in Moechnig. Pet. 51 (citing Ex. 1003 ¶¶ 152–153; Ex. 1007, Fig. 1; Ex. 1008, Fig. 1). Petitioner also argues that “Valat’s steerer tube would have been mounted on the bicycle frame to connect to the handlebar and the fork crown in a conventional manner to steer the bicycle,” as shown in, for example, Moechnig. *Id.* (citing Ex. 1003 ¶ 153).

According to Petitioner, the ordinarily skilled artisan “would have been motivated to improve the Valat design by having the internal cross-sectional contour of the lower section of the tube be an ellipse as taught by Denk instead of Valat’s reinforcement ribs” so that the proposed “modification would allow the wall thickness to transition around the internal perimeter smoothly and continuously, thereby reducing stress

concentration or failure points.” Pet. 52 (citing Ex. 1003 ¶¶ 154, 156; Ex. 1006, col. 3). Petitioner contends that the proposed modification would have been easier to manufacture. *Id.* (citing Ex. 1003 ¶ 154). The expressly recognized benefits of the proposed modification, Petitioner argues, are “improving the strength and rigidity (or loadbearing) properties of Valat’s steerer tube in the vertical plane of the bicycle frame where higher loads or stresses occur” and “reducing the weight of the steerer tube to provide ‘a lighter weight machine.’” *Id.* (citing Ex. 1003 ¶ 155; Ex. 1006, code (54), cols. 1–2, 9; Ex. 1007, 1:10–14).

Petitioner also argues that one of ordinary skill in the art would have “incorporate[d] Denk’s varying wall thickness to the lower part *a* of Valat’s steerer tube by positioning the maximum thickness areas in the vertical plane of travel as disclosed in Denk.” Pet. 52–53 (citing Ex. 1003 ¶ 157; Ex. 1009, 7:29–8:3). Petitioner further argues that the proposed modification would have “reinforc[ed] at the areas of higher loads and reduc[ed] materials (and tube weight) at areas of lower loads at the lower part *a* of Valat where reinforcement is preferred.” *Id.* at 53 (citing Ex. 1003 ¶ 157; Ex. 1006, col. 1; Ex. 1007, 1:35–43, 1:79–90, 1:102–105).

Petitioner additionally argues that the proposed combination would have had a reasonable expectation of success. Pet. 53–55 (citing Ex. 1003 ¶¶ 158, 159; Ex. 1006, cols. 4, 9–10, Figs. 1a, 4a–5d; Ex. 1007, Fig. 1).

b) Petitioner Shows a Reasonable Likelihood of Prevailing

Based on the preliminary record, Petitioner sufficiently shows that its proposed combination teaches or suggests the limitations of claim 1 and that one of ordinary skill in the art would have combined the cited references in the manner asserted with a reasonable expectation of success.

Patent Owner responds that Valat, alone or combined with other references, does not disclose or suggest a varying wall thickness with a maximum in the direction of bicycle travel. Prelim. Resp. 21, 23–24 (citing Ex. 1007, Fig. 2). Patent Owner also responds that Valat, alone or combined, does not disclose or suggest wall thickness varying with cross-sectional angle and that Petitioner’s view of the limitation is too broad. *Id.* at 24–26 (citing Pet. 65; Ex. 1001, 1:60–2:10, 6:15–19, 6:59–64, Figs. 3, 6–10, 13–17, 19–23, 25–29, 31–36; Ex. 1007, Figs. 2–5).

This responsive argument, however, does not address Petitioner’s proposed modification of Valat with the teachings of Denk so that Valat as modified would have the required varying wall thickness. *See* Pet. 52–53. At this stage, Petitioner presents sufficient argument and evidence that one of ordinary skill in the art would have had reason to orient Valat’s tube as modified by Denk so that the maximum thickness is in the plane of travel. *See id.*

Patent Owner further responds that Valat does not disclose outer surfaces that are circular in cross section. Prelim. Resp. 26–30 (citing Pet. 49–50, 61–63; Ex. 1003 ¶¶ 49, 181, 182; Ex. 1007, 1:58–63, 1:70–77, 1:86–90, 1:97–2:4, Figs. 1, 2). On the record before us, Petitioner presents sufficient argument and evidence that one of ordinary skill in the art would have understood Valat has outer surfaces with circular cross-sections. *See* Pet. 61–63. Further, Patent Owner presents a factual question regarding Valat’s disclosure that would benefit from developing the record further during trial.

Turning to the asserted motivation to combine, Patent Owner responds that the proposed combination is based on hindsight because Valat reinforces a steerer tube by including helical ribs. Prelim. Resp. 30 (citing

Pet. 52–54; Ex. 1007, 1:35–51, Fig. 1). Petitioner provides sufficient reasons for modifying Valat with Denk that, according to Petitioner, are benefits expressly recognized by the references. Pet. 52 (citing Ex. 1003 ¶ 155; Ex. 1006, code (54), cols. 1–2, 9; Ex. 1007, 1:10–14). At this stage, the proposed combination does not appear to be the product of impermissible hindsight.

Patent Owner also responds that one of ordinary skill in the art would not remove Valat’s ribs, removing Valat’s ribs would change Valat’s principle of operation, and modifying Valat to include weakness in some directions would defeat Valat’s purpose. Prelim. Resp. 30–32 (citing Ex. 1007, 1:35–51). Petitioner, at this stage, provides sufficient reasons for replacing Valat’s reinforcements with Denk’s continually changing wall thickness and orienting the maximum wall thickness in the direction of travel to obtain asserted, recognized benefits. Pet. 52–53. On the preliminary record, the asserted benefits appear to align with, and would not defeat, Valat’s principle of operation and purpose. This issue, however, would benefit from further development during trial.

For the reasons above and on the preliminary record, Petitioner shows a reasonable likelihood of prevailing in its challenge to claim 1.

3. Remaining Challenged Claims

Claims 2–4, 6, 8, 10, 12, 14–18, 20, 22, 24, 26–29, 33–38, 40, 42, 44, 46–49, 53, and 56–60 ultimately depend from claim 1. Petitioner argues with citations to the record that Valat, Denk, and Moechnig would have rendered obvious these claims. Pet. 71–82. Patent Owner responds with the same arguments described above for claim 1. *See* Prelim. Resp. 21–32.

Petitioner also argues with citations to the record that Valat, Denk, and Moechnig would have rendered obvious independent claim 61 and its

dependent claims 62 and 63. Pet. 68–70, 74–75. Patent Owner responds with the same arguments summarized above for claim 1. *See* Prelim. Resp. 21–32.

For the reasons above and on the preliminary record, Petitioner shows a reasonable likelihood of prevailing in its challenge to these claims.

G. Asserted Obviousness Based on Valat, Moeching, Denk, and Schroeder

Petitioner argues that Valat, Moechnig, Denk, and Schroeder teach the limitations of claims 31, 51, and 64. Pet. 83–84 (citing Ex. 1003 ¶¶ 241–246). Petitioner also refers to previous arguments. *Id.* at 82–83. Petitioner also argues that one of ordinary skill in the art would have been motivated to use two different materials in Valat with a reasonable expectation of success so that Valat would have improved durability and shock absorption capabilities with reference to previous arguments for the proposed combination of Denk, Moechnig, and Schroeder. *Id.* at 82–83 (citing Ex. 1003 ¶¶ 239, 240; Ex. 1010, 4:22–26). Patent Owner responds with the same arguments summarized above for claim 1. Prelim. Resp. 21–32.

For the reasons above and on the preliminary record, Petitioner shows a reasonable likelihood of prevailing in its challenge to claims 31, 51, and 64.

IV. CONCLUSION

After considering the evidence and arguments presented in the Petition and the cited evidence, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing in proving that at least one of claims 1–4, 6, 8, 10, 12, 14–18, 20, 22, 24, 26–29, 31, 33–38, 40, 42, 44, 46–49, 51, 53, and 56–64 of the ’993 patent is unpatentable, and thus, we

institute an *inter partes* review of all challenged claims on all presented challenges. 37 C.F.R. § 42.108(a).

At this stage of the proceeding, the Board has not made a final determination as to the patentability of any challenged claim or any underlying factual and legal issues.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–4, 6, 8, 10, 12, 14–18, 20, 22, 24, 26–29, 31, 33–38, 40, 42, 44, 46–49, 51, 53, and 56–64 of U.S. Patent No. 10,328,993 B2 is instituted with respect to all grounds set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4(b), *inter partes* review of U.S. Patent No. 10,328,993 B2 shall commence on the entry date of this Order, and notice is hereby given of the institution of a trial.

IPR2024-00491
Patent 10,328,993 B2

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