

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FOX Factory, Inc.,
Petitioner,

v.

SRAM, LLC,
Patent Owner.

IPR2024-00491
U.S. Patent No. 10,328,993

**SUPPLEMENTAL DECLARATION OF ALEXANDER SLOCUM, PH.D. IN
SUPPORT OF PETITIONER'S REPLY**

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I, Alexander H. Slocum, declare as follows:

I. Introduction

1. I have been retained as a technical expert in the field of engineering and mechanical devices by Finnegan, Henderson, Farabow, Garrett & Dunner, LLP (“Finnegan”) on behalf of FOX Factory, Inc. (“Petitioner” or “FOX”) in *inter partes* review proceeding involving U.S. Patent No. 10,328,993 (“the ’993 patent”).

2. I previously prepared a Declaration (Ex. 1003) in this proceeding dated January 29, 2024, in support of the Petition for *Inter Partes* Review of the ’993 patent filed on February 1, 2024. I understand that the Board instituted *inter partes* review of the ’993 patent on August 7, 2024, on all challenged claims and grounds. I was deposed in this proceeding on October 23, 2024. A transcript of my deposition is marked as Ex. 2019. I understand that on October 31, 2024, Patent Owner (“Patent Owner” or “SRAM”) filed a Patent Owner’s Response, supported by a declaration by Dr. Kim Parnell, which is marked as Ex. 2021.

3. I also understand that on November 19, 2024, the Court in the counterpart district court litigation entered a Claim Construction Order that construed two claim terms of the ’993 patent. The Claim Construction Order is marked as Ex. 1025.

4. I have been asked by Petitioner to prepare this reply declaration (“Supplemental Declaration”) setting forth my additional comments and opinions on

whether 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 ("the Challenged Claims") would have been obvious to a person of ordinary skill in the art in view of the prior art combinations set forth in the Petition and in light of the arguments set forth in Patent Owner's Response and the accompanying exhibits, including the declaration by Dr. Parnell (Ex. 2021) and the District Court's Claim Construction Order (Ex. 1025). And based on my review of those materials, I offer the supplemental remarks in this Supplemental Declaration.

5. This Supplemental Declaration supplements my prior Declaration (Ex. 1003) in support of the Petition for *Inter Partes* Review of the '993 patent. In my prior Declaration, I address many topics, including (but not limited to) my background and qualifications, the level of ordinary skill in art, an overview of the '993 patent, certain legal standards explained to me by counsel, legal principles applied for forming my opinions, and a detailed analysis of the prior art against the claim elements of the Challenged Claims of the '993 patent. I maintain all my earlier analysis and continue to hold the opinions expressed in my prior Declaration. This Supplemental Declaration does not replace my prior Declaration and does not cover every topic addressed in my prior Declaration. Both declarations are complementary and should be read in tandem.

6. The analyses and opinions expressed in my prior Declaration fully explain why a person of ordinary skill in the art would have found the Challenged Claims obvious over the prior art. Patent Owner's expert, Dr. Parnell, has considered my opinions and offered his own, some of which are inconsistent with mine. I will address certain points of dispute below. Any opinions of Dr. Parnell not addressed herein should not be interpreted as my agreement with them.

7. As I mentioned in my prior Declaration, although I am being compensated for the time I spend on this matter and reimbursed for expenses that I incur during this work, my compensation is not contingent upon the results of my study, the substance of my opinions, or the outcome of any proceeding involving the Challenged Claims. I have no financial interest in the outcome of this proceeding or on the pending district court litigation between FOX and SRAM.

8. My qualifications and experience are detailed in my prior Declaration, and in my curriculum vitae, submitted previously. Ex. 1003.

9. Consistent with my prior Declaration, based on my experience, knowledge of the art at the relevant time, analysis of the prior art references, and the understanding a person of ordinary skill in the art would have of the claim terms in light of the specification, it is my opinion that the Challenged Claims of the '993 patent are obvious based on the prior art combinations presented in the Petition.

10. My analysis of the materials produced in this proceeding is ongoing. I will continue to review any new material as it is provided. I reserve the right to revise, supplement, and/or amend my opinions stated herein based on new information and on my continuing analysis of the materials already provided.

II. Level of Ordinary Skill in the Art

11. In my prior Declaration, I proposed a definition for a person of ordinary skill in the art as follows:

a person of ordinary skill in the art (“POSITA”) 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.

Ex. 1003, ¶23.

12. I understand that Patent Owner proposed a level of ordinary skill for the ’993 patent that differs from the one I proposed in my prior Declaration. Dr. Parnell agrees with Patent Owner’s definition and states in his declaration:

I agree with SRAM that, here, a POSITA is more appropriately connected to, and considers the particularities of, vehicle component and like design.

Specifically, one of ordinary skill in the art at the time of the '993 Patent may include a person with 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.

Ex. 2021, ¶57.

13. My opinions set forth in my prior Declaration and herein would be the same under either my or Patent Owner's proposed definition of a person of ordinary skill in the art.

14. I understand that Patent Owner has argued that I am a generalist expert and do not meet these requirements set forth in Patent Owner's definition. I disagree. First, in my opinion, the specific "experience in design of vehicle components" as required in Patent Owner's definition is not based on the disclosure of the '993 patent or the prior art. The design of vehicle components can cover various aspects, such as the design of lighting components, mirrors, wheels, internal combustion, environmental controls, etc., which have nothing to do with the disclosure of the '993 patent or the prior art.

15. Second, Patent Owner's criticism regarding my broad expertise in the field of engineering and mechanical devices is unwarranted, and would apply equally to Dr. Parnell. I respect Dr. Parnell's broad experience in engineering, and I have even greater specific experience in the design of mechanical elements and structures in

various fields, including energy (oil and gas drilling and production equipment, wind turbines), semiconductor, automotive, aerospace, and medical device components and manufacturing equipment, as well as in design of vehicle components, such as robotic vehicles. And I have years of experience teaching courses and supervising students on all the aspects of precision machine design—applying mechanical and structural design principles to the design of mechanical components—and covering both theoretical analysis and practical implementations. I am a member of the National Academy of Engineering and have numerous patents, published articles and products specifically related to machine elements and machinery that are relevant to the challenged patent and the prior art. Accordingly, I believe that I have the relevant experience and understanding of one of ordinary skill in this field under either my or Patent Owner’s proposed definition.

III. Claim Construction

16. I have been informed by counsel and understand that in an *inter partes* review, claims are construed using the same claim construction standard that a United States District Court would use to construe the claims in a civil action. I understand that in the counterpart district court litigation, Petitioner and Patent Owner disagreed about the proper constructions of certain claim terms.

17. I understand that the District Court construed the disputed claim terms as follows (Ex. 1025, 16-17):

Claim Term	Court's Construction
“vertical plane of travel of the bicycle” / “plane of travel” (’993 Patent; claims 1, 61, 64)	“vertical plane aligned with the running direction of the bicycle”
“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” (’993 Patent; claims 1, 61, 64)	“a thickness of the wall at any point in the lower section of the body changing as the cross-sectional angle of the point relative to the plane of travel change”

18. My prior Declaration and the Petition demonstrate unpatentability of the Challenged Claims both under the District Court’s constructions and the plain and ordinary meaning of the terms. I understand that Dr. Parnell agrees with Patent Owner that no claim construction is needed and applies plain and ordinary meaning of these terms, which is what I had done in my prior Declaration.

A. “vertical plane of travel of the bicycle” / “plane of travel”

19. I believe the ’993 patent is clear, and the District Court’s construction confirms, that the “vertical plane of travel of the bicycle” or “plane of travel” is *aligned with* the running direction (or fore-and-aft direction) of the bicycle. Ex. 1001, 1:8-12 (“A conventional bicycle (a mountain bike is shown at 100 in FIG. 1) 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.”).

20. Indeed, as shown below, both the steering axis, which extends along a substantially vertical direction (or up-and-down direction), and the running direction (or fore-and-aft direction) of the bicycle are *within* the “vertical plane of travel of the bicycle.” Ex. 1001, FIGS. 1-2, 1:19-22 (“[S]teering axis X [] is within the plane of travel P.”); Ex. 2021, ¶43 (“the fore-aft direction (which is in the plane of travel of the bicycle)”).

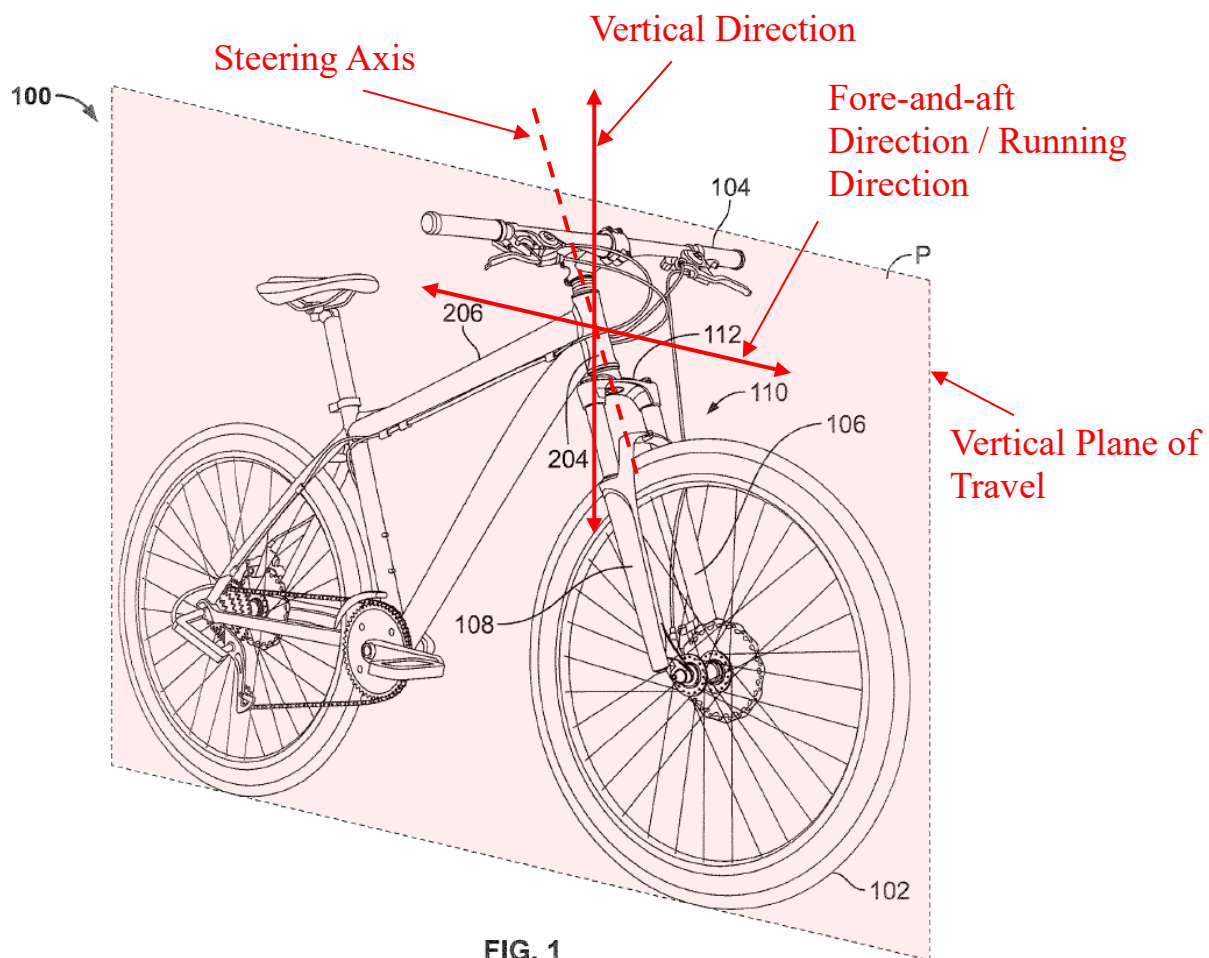


FIG. 1

Ex. 1001, FIG. 1 (annotated).

21. A POSITA would have understood that the vertical plane of the bicycle frame is coplanar with the plane of travel that is aligned with the running/fore-and-aft direction regardless of whether the plane of the front wheel is within or out of the plane of travel. Ex. 1001, 1:8-12 (“A conventional bicycle (a mountain bike is shown at 100 in FIG. 1) 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.”).

B. “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”

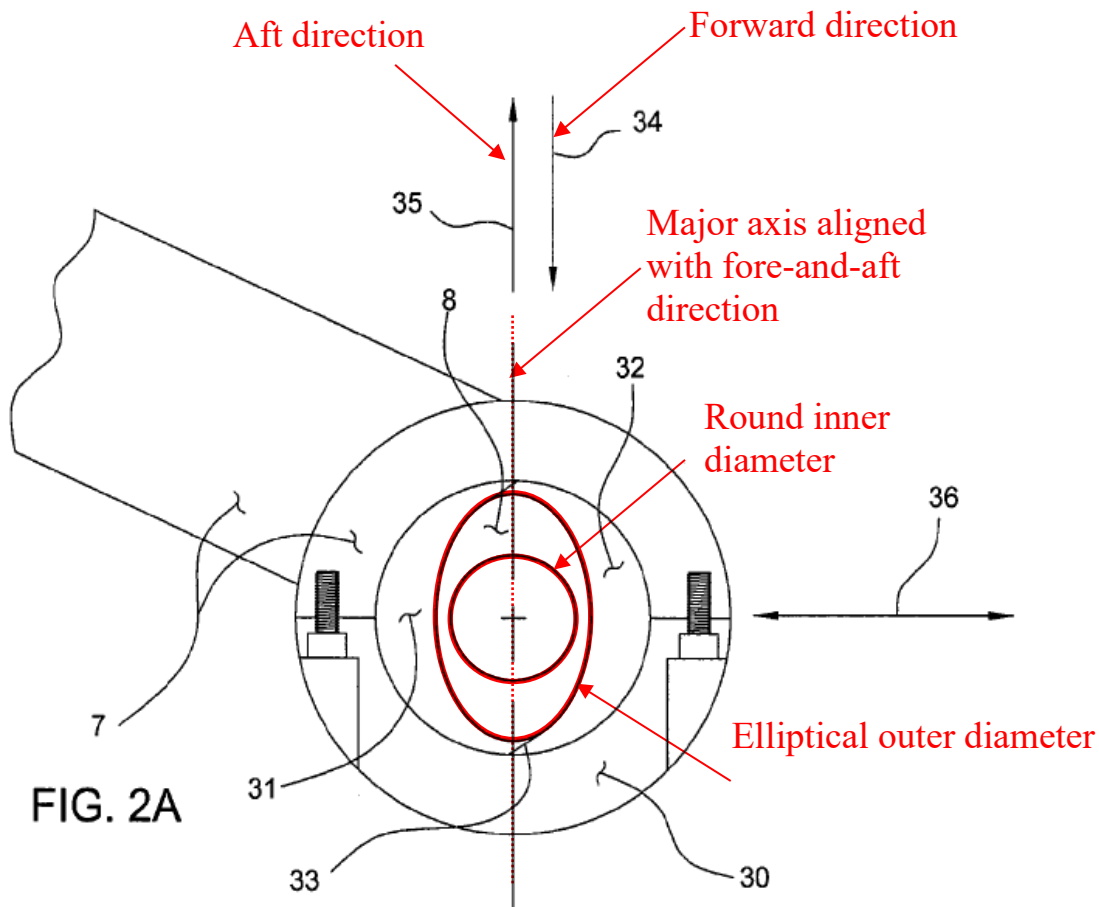
22. Regarding the term “a thickness of the wall at any point in the lower section of the body varying as a function of the cross-sectional angle of the point relative to the plane of travel,” I understand that Dr. Parnell interprets this term as requiring a wall thickness that is “continuously varying.” Ex. 2021, ¶94. I agree with the District Court’s analysis that such interpretation is not supported by the specification and prosecution history of the ’993 patent and would read a meaning into the claim from the embodiments in the specification. Ex. 1025, 13-14. As I will explain in more detail below, Denk and Valat both disclose or render obvious a steerer tube whose wall thickness at any point in the lower section of the body changes as the cross-sectional angle of the point relative to the plane of travel changes.

IV. It Was Known to a POSITA Before the Filing of the '993 Patent Application that a Bicycle Steerer Tube Experiences More Loads in the Plane of Travel

23. In the section of “Technical Overview of the Inventions of the ‘993 Patent,” Dr. Parnell discussed why and how, in his opinion, the ‘993 Patent discloses improvements to a steerer tube of a bicycle fork. Ex. 2021, ¶¶29-55. Dr. Parnell’s opinions are based on his misunderstanding that steerer tubes before the ‘993 patent always had uniform thickness and did not address the significant loads experienced by the steerer tube in the fore-and-aft direction. *Id.* at ¶¶29-40. According to Dr. Parnell, unlike prior art steerer tubes, “the ‘993 Patent discloses steerer tubes that have greater wall thickness in the fore-aft direction.” *Id.* at ¶41; *see also id.* at ¶42. Dr. Parnell concludes that “the ‘993 Patent uniquely discloses both strengthening the steerer tube in the fore-and-aft direction and reducing its overall weight.” *Id.* at ¶54. I disagree because prior to the filing of the ‘993 patent application, it was known to a POSITA that a bicycle steerer tube experiences higher loads in the fore-and-aft plane of travel.

24. For example, Galasso (Ex. 1013) discloses designing a bicycle or motorcycle fork chassis that can better handle anticipated loads. Galasso, 1:25-60. Specifically, Galasso discloses that a fork chassis includes a lower/inner tube set, an upper/outer tube set (also referred to as stanchions), a lower triple clamp, an upper triple clamp, and a steering tube. Galasso, 2:50-59. Galasso teaches that it is advantageous to

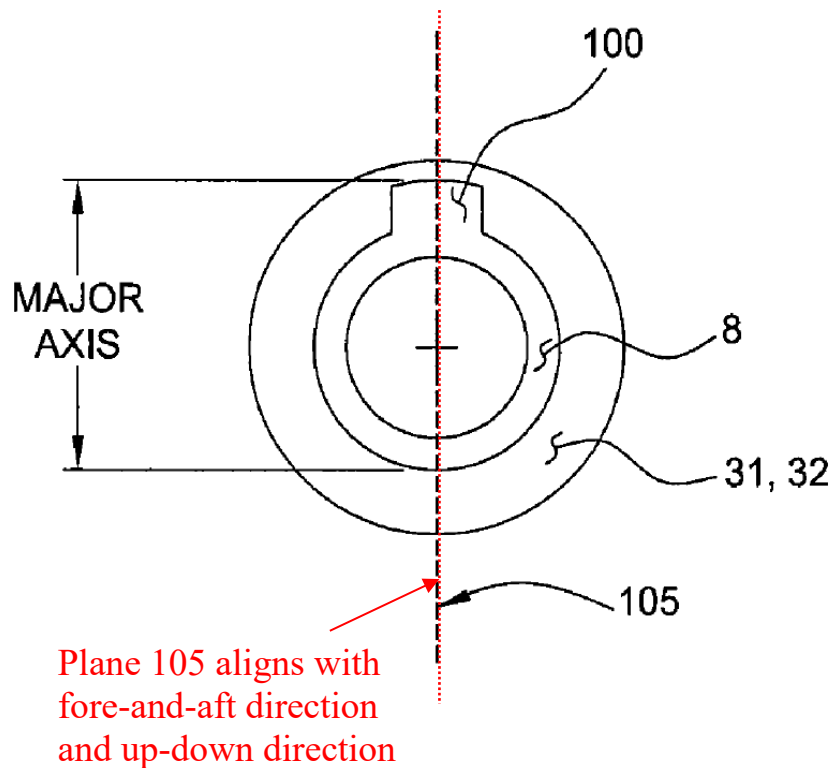
selectively tune the stiffness of the fork chassis (including the steerer tube) in the fore-and-aft and up-and-down directions. *Id.*, 2:45-59. Taking a stanchion tube (also known as a fork leg) as an example, Galasso discloses increasing the stiffness of the tube in the fore-and-aft direction of a bicycle or a motorcycle by designing the tube to have a round inner diameter and an elliptical outer diameter with the major elliptical axis substantially aligned with the fore-and-aft direction. *Id.*, 4:22-29, FIGS. 1, 2A. As shown below, the thickness of such a tube is maximum along the major axis, which is aligned parallel to fore and aft directions 34, 35 (referred to as center planes) of the vehicle (e.g., motorcycle, bicycle), such that “the fork will be in its’s stiffest front to rear setting.” *Id.*, 5:10-16, FIGS. 1, 2A, 3.



Ex. 1013, FIG. 2A (annotated).

25. Galasso discloses another suitable option for a stanchion tube having a non-round “lobe” to enhance the tube stiffness along a plane 105, as shown in Figure 5A below. *Id.*, 4:46-57. Galasso explains plane 105 extends fore-aft and up-down relative to a vehicle. *Id.*, 8:53-57. Importantly, Galasso discloses that its tube designs can be applied to *all tubes of a fork chassis, including the steerer tube*. *Id.*, 2:45-59.

FIG. 5A



Id., FIG. 5A (annotated).

26. During prosecution of the '993 patent, the Examiner analyzed Galasso and found that “Galasso discloses a vehicle suspension comprising: a tube (8) with a thickness of the wall at any point in a 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 vehicle (See figure 2A).” Ex. 1002, 42. I agree with the Examiner’s analysis of Galasso because it is consistent with Galasso’s teachings, as I discussed above. Patent Owner did not dispute the

Examiner's analysis of Galasso and instead amended the independent claims to gain allowance. Ex. 1002, 24-38. Thus, the Examiner did not find the claimed feature requiring the maximum thickness to be in the plane of travel was novel.

27. Klein (Ex. 1023) is another prior art reference that discloses reinforcing the strength of the tubes of a bicycle fork along the fore-and-aft direction. *See* Klein, 4:21-29 (“In the front forks, the normal loading includes some torque loads and some side loading. The heaviest loads will come from vertical bumps or head-on impact and/or braking forces. Both vertical and longitudinal forces stress the front fork at a fore/aft cantilever bending motion. In a simple analysis, it appears that **increasing the strength of the fork blades and steerer fore and aft cantilever would be the correct approach.**”) (emphasis added).

28. Additionally, I have reviewed the translation of a decision from the China National Intellectual Property Administration issued in the reexamination of the Chinese counterpart application of the '993 patent. Ex. 1004. Like the USPTO Examiner, the reexamination decision stated that:

It is common knowledge in the art that the steerer tube of a bicycle bears the greatest strength in a traveling plane. Therefore, in order to enhance the strength of the steerer tube of a bicycle, those skilled in the art, under inspiration by [Denk] can apply the wall shape of the tube of FIG. 1c to [Schroeder] so that the wall thickness of the steerer tube is at a maximum in the

traveling plane of the bicycle, which is obvious to those skilled in the art.

Ex. 1004, 10-11 (emphasis added).

29. I agree with the reexamination decision that it was known to a POSITA that a tube of a bicycle fork, including the steerer tube, bears the highest loads in the plane of travel, which is aligned with the fore-and-aft direction of the bicycle. Indeed, Klein explains “[t]he heaviest loads will come from vertical bumps or head-on impact and/or braking forces,” and “[b]oth vertical and longitudinal forces stress the front fork at a fore/aft cantilever bending motion.” Ex. 1023, 4:21-29. Denk discloses that tubes should be configured to meet the requirements of strength and rigidity in the load direction. Denk (Ex. 1006), cols. 1-2. Thus, a POSITA would have understood that when using Denk’s elliptical tube design as a steerer tube, the areas of maximum thickness and thus maximum strength should be aligned with the plane of travel to withstand the high bending forces in the fore-and-aft direction, which is aligned with the plane of travel. Thus, Denk’s tube design provides a solution to address such high loads in the plane of travel.

30. Accordingly, at the time the ’993 patent application was filed, a POSITA would have known that bicycle steerer tubes experience more loads in the fore-aft plane of travel. And as evidenced in Galasso, Campagnolo, and Denk, a POSITA would have known to increase the thickness in the fore-aft direction of the bicycle

to increase the strength and stiffness of the tube in the plane of travel, which is aligned with the fore-and-aft direction of the bicycle.

V. A POSITA Would Have Found It Obvious to Use Denk's Tube as a Steerer Tube with Maximum Thickness in the Plane of Travel

A. Dr. Parnell admits that a steerer tube is a part of a bicycle fork

31. In the overview of “Steerer Tubes,” Dr. Parnell stated “[a] steerer tube is a key component of a bicycle fork” (Ex. 2021, ¶26), and “the steerer tube is an important component of any bicycle fork and related bicycle” (*id.* at ¶28). Throughout his declaration, Dr. Parnell generally considers a steerer tube as a component of “bicycle forks” or “forks.” *Id.* at ¶¶33, 47, 48, 53.

32. I agree with Dr. Parnell that a steerer tube is a part of a bicycle fork. The prior art references also describe a steerer tube as part of a bicycle fork. Moechnig (Ex. 1008), [0002]-[0003] (teaching a typical fork includes a steerer tube, a fork crown, and fork legs); Galasso, 2:45-63 (describing a motorcycle or bicycle fork includes a steering tube), 3:12-57 (reviewing various prior art references teaching a motorcycle fork or a bicycle fork includes a steering tube); Schroeder (Ex. 1010), Abstract, 2:11-27 (teaching a bicycle fork includes a steering tube); Klein, 5:49-55 (describing the front fork of a bicycle includes a steering tube). Indeed, the '993 patent describes steerer tube 200 as a part of bicycle fork 110. Ex. 1001, 4:58-62,

FIGS. 1-2. Thus, in my opinion, when prior art references discuss “forks” or “fork tubes,” a POSITA would understand such discussions to include the steerer tube.

B. Denk explicitly discloses that its tubular component can be used for a bicycle fork, and thus as a steerer tube

33. Denk discloses that its lightweight tube design is suitable for all tubular components of a bicycle frame, including a top tube, down tube, seat tube, head tube, fork tubes, rear wheel stay, seat posts, handlebars, handlebar stem, and the like. Denk, Abstract, cols. 1, 4. Denk further claims in claim 18 that “the lightweight component is designed in such a way that it is formed as **part of a bicycle fork.**” Denk, col. 12 (emphasis added). I understand Denk’s disclosure and invention to be applicable to all tubes of a bicycle fork, including the steerer tube.

C. Dr. Parnell’s understanding of Denk as specific to bicycle frames is unreasonable and disregards express teachings of Denk

34. Despite Denk’s teaching that its lightweight tube design can be used for all tubular components of a bicycle, including as bicycle fork tubes, Dr. Parnell interprets Denk as being “concerned with issues specific to frames” that are not applicable to steerer tubes. Ex. 2021, ¶64. I strongly disagree.

35. As Dr. Parnell acknowledges, the orientation of a steerer tube is similar to that of seat tube. Ex. 2021, ¶62. The orientation of a steerer tube is also similar to the head tube. Thus, a steerer tube would at least bear similar loads, as the seat tube and head tube, and Denk explicitly states that its tubular design is applicable to seat tubes

and head tubes. Denk, Abstract, cols. 1, 4. Therefore, a POSITA would have readily understood that Denk's design is also applicable to steerer tubes. Denk's express disclosure that its tubular design can be used for bicycle forks would have further confirmed to a POSITA that Denk's design is applicable to the steerer tubes of bicycle forks. *See above* ¶33.

36. Moreover, as discussed above, it was known to a POSITA that a steerer tube would bear highest loads in the plane of travel aligned with the fore-and-aft direction of the bicycle. And it was known that such loads derive at least from forces in the "up and down" directions. Galasso, 8:53-62. And vertical loads or forces imposed on the bicycle frame, such as the seat tube and head tube, would similarly bear down on the steerer tube, which cause bending forces in the fore-and-aft direction. *Id.* Dr. Parnell's opinion that "forces existing in the vertical direction are somewhat irrelevant to a steerer tube because the tube is essentially arranged to have its lengthwise direction oriented along the vertical direction" (Ex. 2021, ¶74; *see also id.* at ¶¶72, 76) is conclusory and incorrect. As discussed, the steerer tube would bear similar vertical loads like a seat tube and head tube, and the vertical loads on the steerer tube would cause bending stress of the steerer tube in the plane of travel.

37. Dr. Parnell opines that Denk is limited to bicycle frames because Denk only focuses on forces derived from gravity pulling the rider down but does not address

the various other forces experienced by a steerer tube, such as stresses at the ends of the tubing or twisting torques. Ex. 2021, ¶¶61-64. But the fact that Denk does not mention all forces experienced by a steerer tube does not mean a POSITA would have understood its teachings as inapplicable to a steerer tube. In fact, Denk's lightweight tube design, as recognized by the Chinese Patent Office in the reexamination decision of the counterpart Chinese application, would address the highest loads in the plane of travel, and this was commonly known.

D. The weight or strength of Denk's tube is irrelevant to the motivation or reasonable expectation of success for using Denk's tube as a steerer tube

38. Dr. Parnell opines that “Denk's frame component is not lighter nor stronger than any particular steerer tube,” and “Denk's frame component may be made to be heavier and weaker than another steerer tube because the weight and strength of such a steerer tube is dependent on many, many factors beyond the shape of the tubing.” Ex. 2021, ¶69. These statements do not undercut Denk's teachings on how to design a lightweight tube with reinforced strength in the plane of highest loads. A POSITA would have understood how to design a suitable lightweight steerer tube based on Denk's teachings and using ordinary creativity. For example, knowing that a bicycle steerer tube experiences highest loads in the plane of travel, a POSITA would have known to orient Denk's tube (as shown in Fig. 1a) in such a way that the areas of the steerer tube wall having maximum thickness—and thus the areas with highest tube

strength—are aligned with the plane of travel. *See* Denk, col. 2 (“[F]or the same overall strength and rigidity, the weight may be reduced, or for the same weight, the strength and rigidity may be significantly increased in the load direction specified by the design.”); *see also id.* at col. 1 (teaching adapting the lightweight component in a particularly advantageous manner to the loads that occur during use, and which thus has a *particularly favorable ratio of strength properties and rigidity properties with regard to the weight*) (emphasis added); Galasso, Abstract, 1:49-60 (teaching tuning or adjusting the reinforcement in a chosen direction as desired).

E. Denk explicitly discloses orienting the maximum wall thickness in the vertical plane of the bicycle frame

39. Dr. Parnell opines that Denk fails to disclose a steerer tube oriented with its maximum thickness in the plane of travel. Ex. 2021, ¶¶70-75. But Denk explicitly teaches that bicycle frames, such as those of mountain bikes, need to have low weight but high strength and rigidity, particularly in the vertical plane of the frame where high loads occur during use. Denk, cols. 1-2. And since the vertical plane of a bicycle frame is coplanar with the plane of travel, a POSITA would have understood Denk’s teachings as applicable to the plane of travel as well. That is, Denk’s disclosure of having the maximum wall thickness in the vertical plane would have suggested to a POSITA to orient the maximum wall thickness of a steerer tube in the plane of travel.

40. Accordingly, when implementing Denk's lightweight tubular component as a steerer tube, it would have been obvious and practical to align the maximum wall thickness with the plane of travel of the bicycle (i.e., also the vertical plane of the bicycle frame) because the loads or forces on the steerer tube are highest in the plane of travel. *Id.*

VI. Dr. Parnell's Analysis of Moechnig Is Incorrect

A. Dr. Parnell Misinterprets Moechnig

41. Dr. Parnell opines that Moechnig contradicts Petitioner's argument that the highest and most concerning loads occur in the fore-aft direction of travel. Ex. 2021, ¶¶82-84. This is incorrect.

42. As discussed above, the prior art references teach designing the reinforcement structures of a bicycle fork according to the needs in each particular use case. For example, Galasso discloses tuning the structural reinforcements of a bicycle or motorcycle fork to suit the needs of a particular user. Galasso, 1:49-60. Denk discloses adapting the wall thickness profile of the lightweight tubular component to the actual requirements for strength and rigidity. Denk, col. 2. And as discussed above, Denk discloses its lightweight tubular component can be formed as part of a bicycle fork. *Id.* at col. 12.

43. Moechnig discloses one particular use case. Specifically, Moechnig teaches decreasing the fore-aft stiffness of the steerer tube (i.e., increase compliance) not

because the loads experienced by the steerer tube are less in the fore-and-aft direction and higher in a lateral direction, as asserted by Dr. Parnell. Rather, Moechnig discloses decreasing the fore-aft stiffness for two benefits. First, Moechnig discloses decreasing the fore-aft stiffness to “decrease [] the amount of force that is transmitted to the rider therein increasing the comfort level associated with the use of bicycle.” Moechnig, [0049]. Second, Moechnig discloses that decreasing the fore-aft stiffness would distribute the load over a greater duration of impact; “increase[] the compliance of the steerer tube to fore and aft loading”; and “provide greater fore and aft impact performance as compared to steerer assemblies of comparable weight.” *Id.* Nowhere does Moechnig teach that the highest loads do not occur in the fore-and-aft direction or in the plane of travel of the steerer tube.

44. Indeed, Moechnig teaches that more rigid lateral support provides efficient communication of the steering input and lateral handling characteristics. *Id.* Thus, Moechnig teaches a preferred use case that provides different lateral and fore-and-aft performances. *See* Galasso, 1:30-48 (teaching different riders prefer different stiffness of the fork). Moechnig’s particular use case is not contrary to the common knowledge that the steerer tube bears the highest loads in the plane of travel, which is aligned with the fore-and-aft direction. In fact, a POSITA would have understood that to withstand the high loads in the plane of travel, one could either increase the

stiffness/strength of the tube in the fore-aft direction, or increase compliance of the tube in that direction to bend with the load and absorb shock to the rider and frame while still providing adequate strength against failure. It is a matter of design choice, and while some engineers will increase the tube compliance in the fore-art direction to manage loads, others will opt to increase stiffness in that direction (like in Galasso, Klein, Campagnolo, and Denk); and in either case these goals can be achieved with a varying wall thickness as straightforward analysis would inform the design engineer. In my initial Declaration, I cited formulas for doing such calculations (Ex. 1003, ¶132; *see also* Ex. 1016), and Dr. Parnell has provided no analysis to rebut those calculations, thus implicitly admitting that my analysis and calculations are correct.

45. Based on his analysis of Moechnig alone, Dr. Parnell concludes that “a POSITA would have been concerned with the lateral loading and reducing the transmission of forces to the rider by limiting the stiffness of the steerer tube in the fore-aft direction.” Ex. 2021, ¶82. This is contrary to the design principle of adapting the structural reinforcement to the needs of a particular use case, and contrary to the disclosures of prior art references that teach increasing stiffness of the steerer tube in the plane of travel. *See* Galasso, 2:45-59; Denk, col. 1-2, 12; Klein, 4:21-29.

B. Dr. Parnell misconstrues the contribution of Moechnig to the prior art combinations in the Petition

46. Dr. Parnell opines “[i]n view of Moechnig, which Petitioner proposes to modify Denk, a POSITA would not orient Denk’s tubular frame component to gain strength in the fore-aft direction – Moechnig says to do the opposite.” Ex. 2021, ¶84; *see also id.*, ¶109. Dr. Parnell’s focus on the structural design of Moechnig’s steerer tube is misplaced. The prior art combinations in the Petition and in my prior Declaration rely on Moechnig primarily for its disclosure of the conventional manner of mounting a steerer tube on a bicycle (*see e.g.*, Ex. 1003, ¶¶55, 60, 68-72, 76-80, 152, 153, 159, 171, 174-180), not “for purposes of increasing the strength of Moechnig” (Ex. 2021, ¶81) as alleged by Patent Owner, or for the alleged “position[ing] the areas of maximum cross-sectional thickness of the steerer tube in the vertical plane of the bicycle frame—i.e., the plane of travel of the bicycle.” *Id.*, ¶82.

47. As I discussed in my prior declaration, I understand that the background section of a challenged patent can be understood as applicant admitted prior art (AAPA), and the AAPA (Ex. 1001, 1:8-32, FIGS. 1-2) is evidence of at least the general knowledge at the time of the purported invention that: (1) a bicycle has a steerer tube; (2) a bicycle has a plane of travel aligned with the running direction of the bicycle; (3) a bicycle steerer tube has an elongate body disposed about a steering

axis that lies in the plane of travel of the bicycle; and (4) the lower end of a bicycle steerer tube is affixed to a crown of a front suspension fork of the bicycle and the upper end of the steerer tube is attached (directly or indirectly) to a handlebar of the bicycle. *See* Ex. 1003, ¶¶38-39. Dr. Parnell does not dispute that these were generally known at the time of the filing of the '993 patent application. Neither does Dr. Parnell dispute that Moechnig teaches the conventional arrangement of a steerer tube on a bicycle.

48. In fact, when discussing dependent claims, Dr. Parnell appears to acknowledge that “the Grounds do not rely upon Moechnig to provide the claimed steerer tube.” Ex. 2021, ¶129.

VII. Dr. Parnell’s Analysis of Valat Is Incorrect

A. Dr. Parnell misinterprets Valat’s disclosure and the Petition

49. Dr. Parnell states “Valat does not disclose different ‘configurations’ or embodiments in Valat’s Figures 1 and 2” because Figure 2 shows the finished tube after swage processing of the tube shown in Figure 1. Ex. 2021, ¶¶85-86. Dr. Parnell thus concludes “Valat discloses *only one embodiment* of its steerer tube in Figures 1 and 2.” *Id.* at ¶86. I disagree.

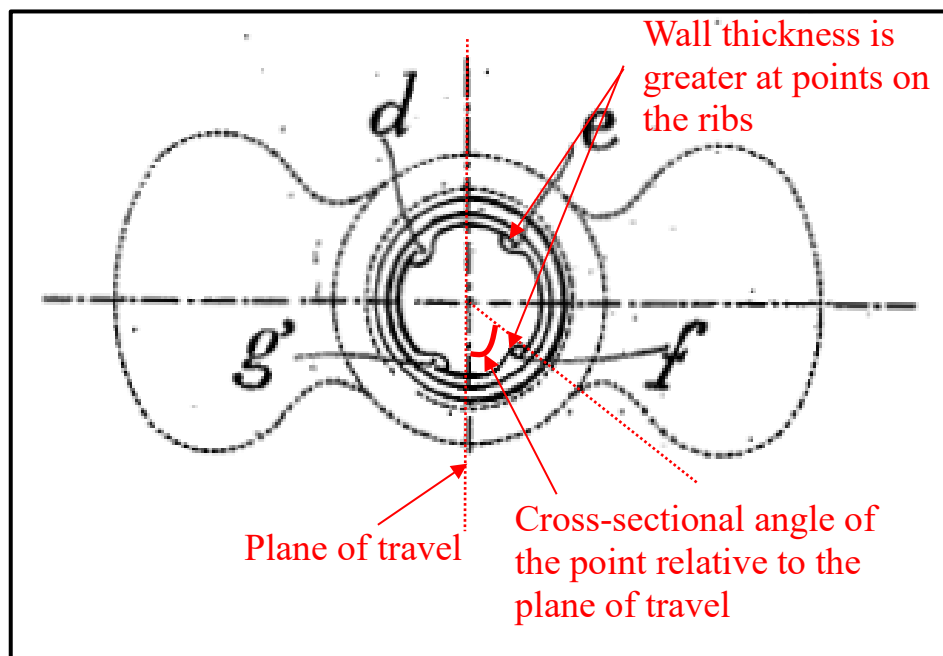
50. Valat’s Figure 1 discloses a first configuration of a steerer tube having greater thickness in the lower part *a* where the loads are greatest. Valat (Ex. 1007), 1:43-50, 1:58-60, 1:70-78. In this first configuration, the steering tube has the thicker lower

part *a* but does not have the reinforcement of helical ribs, although the location of the helical ribs is illustrated in dotted lines in Figure 1. *Id.* at 1:58-60, FIG. 1. Valat's Figure 2 shows a second configuration that has the helical ribs formed in the lower part *a*. *Id.* at 1:79-90, FIGS. 1-2. A POSITA would have understood that both configurations are suitable options for a steerer tube that has greater strength in the lower part *a* where Valat teaches the loads are greatest. *Id.* at 1:75-79, 1:86-90; Ex. 1003, ¶49.

51. Valat does not disclose “*only one embodiment*” that has “a constant external diameter along its length. Ex. 2021, ¶¶86-87. Valat's first configuration is a base configuration to which Valat teaches adding additional reinforcement structures, such as the helical ribs shown in Figure 2, and other alternative reinforcements as shown in Figures 3-5. Valat, 1:79-90, 2:5-15, FIGS. 3-5.

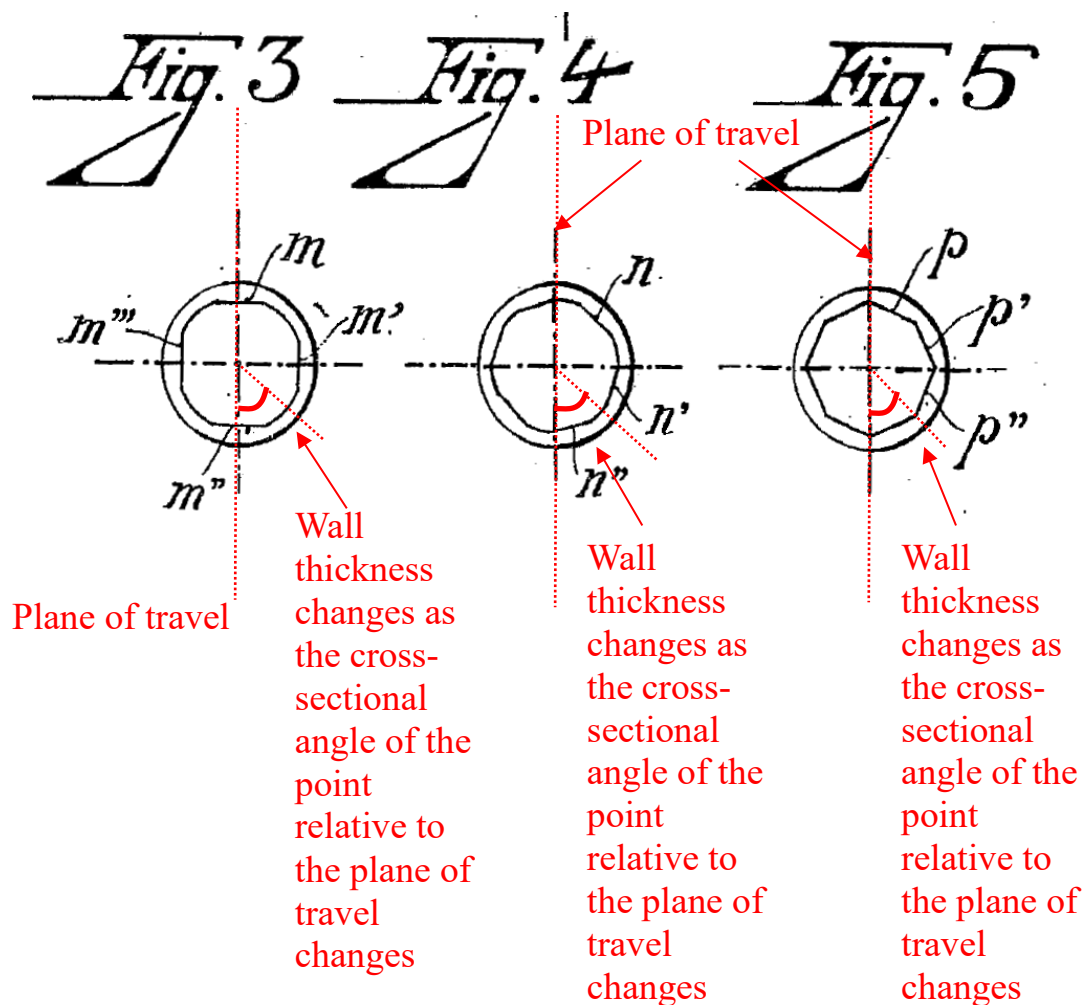
52. Dr. Parnell further opines that Valat's wall does not vary in thickness as a function of the cross-sectional angle of the point relative to the plane of travel. Ex. 2021, ¶¶92-94. This is wrong because it is based on the rejected claim construction that the claims require the thickness of the wall to be “**continuously varying.**” *Id.*; *see above* Section III.B (Claim Construction). Under the District Court's construction, the wall thickness does not need to change continuously as the cross-sectional angle relative to the plane of travel changes. As discussed in my prior

Declaration and illustrated below, Valat's steerer tube formed with helical ribs as shown in Figure 2 would have the wall thickness at any point in the lower section of the body (i.e., lower part *a* and taper *c*) change as the cross-sectional angle of the point relative to the plane of travel changes. Ex. 1003, ¶¶185-187. This is because the reinforcement ribs are integrally formed in the thicker wall of the lower section of the steerer tube via a swaging process (Valat, 1:35-40, 1:96-102), which would cause the thickness of the wall to be greater at points on the ribs than the points not on the ribs. A POSITA would have understood that, even after swaging, the tube's exterior remains circular.



Valat, Fig. 2 (modified, annotated).

53. Valat's alternative reinforcement arrangements in the lower section of the body, as shown in Figures 3-5, also have the wall thickness change as the cross-sectional angle relative to the plane of travel changes, as illustrated below.



Valat, Figs. 3-5 (annotated). Thus, Valat discloses a steerer tube that has “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.”

54. Valat also suggests to a POSITA to consider other reinforcement arrangements that would vary the wall thickness. *See* Valat, 2:5-7 (“any form and disposition of the reinforcements, as well as any number can be provided.”). Denk is one such reference that teaches a reinforcement arrangement that varies the thickness of the wall. In the prior art combinations in the Petition and analyzed in my prior Declaration, I have shown that a POSITA would have modified Valat’s thicker wall in the lower section (i.e., lower part *a* and taper *c*) **of the first configuration** to have Denk’s inner elliptical cross-section, instead of Valat’s helical ribs, to reinforce the areas of the wall in the vertical plane of travel where the loads are highest while maintaining light weight, as taught in Denk. Ex. 1003, ¶¶155-159, 188-189.

55. Dr. Parnell also opines that modifying Valat with Denk’s elliptical inner section would be contrary to “Valat’s primary purpose of providing consistent, 360 degrees around support at the junction between the steerer tube and the fork crown/bridge” (Ex. 2021, ¶¶96-97), and would change “Valat’s principle of operation is to reinforce Valat’s steerer tube along the entire extent of the junction between the steerer tube and the crown/bridge using simple-to-form internal ribs” (*id.* at ¶¶98-99); *see also id.* at ¶100 (“Valat seeks to strengthen its steerer tube ***in all***

directions around the junction between the steerer tube and the fork bridge/crown.”). These assertions are meritless.

56. Valat explicitly teaches “any form and disposition of the reinforcements, as well as any number can be provided.” Valat, 2:5-7. Valat also discloses alternative embodiments as shown in Figures 3-5, which would not reinforce Valat’s steerer tube along the entire junction between the steerer tube and the crown/bridge. Nowhere does Valat disclose such embodiments as undesirable. A POSITA knowing that the loads are highest in the plane of travel would have been motivated to add reinforcements to the tube wall along the plane of travel per the teachings of Denk, and such modifications to Valat’s steerer tube shown in Figure 1 would not have run counter to the teachings and principles of Valat.

B. A POSITA would have been motivated to modify Valat with Denk’s elliptical inner cross-section

57. Dr. Parnell opines that “the Petition fails to show *any benefit* to converting Valat’s ribs to Denk’s component shaping,” and that “Petitioner’s purported advantages of Denk’s frame component are redundant in view of the advantages present in Valat.” Ex. 2021, ¶¶101-106. This is wrong. Valat does not address the loads in the plane of travel. The proposed modification would have modified Valat’s tube wall in the lower section to have Denk’s inner elliptical cross-section, instead

of Valat's helical ribs, to reinforce the areas of the wall in the plane of travel where the loads are highest while minimizing weight. Ex. 1003, ¶¶155-159, 188-189.

58. Dr. Parnell also opines "Petitioner provides no analysis explaining why Denk's internal shape **would be superior or even preferred** to Valat's internal ribbing." Ex. 2021, ¶103. I disagree. I have been advised by counsel that a showing of obviousness does not require the modification to be superior to or preferred over the original. Thus, I understand that the rationale as required by Dr. Parnell is not necessary.

59. Nevertheless, as I explained in my prior Declaration, the modification of Valat's steerer tube to have Denk's inner elliptical cross-section, instead of Valat's reinforcement ribs, is not redundant because the proposed modification of Valat's steerer tube would have the advantage of improved load bearing performance in the vertical plane of travel. Ex. 1003, ¶¶155-157, 188-189. And the proposed modification of Valat in view of Denk would also result in a lighter steerer tube as compared to increasing the thickness of the wall around the tube's cross-section. *Id.*

60. Dr. Parnell opines that "Denk does not explain that its component would be lighter in weight than the rib-reinforced tube in Valat," and "Denk is so broad that the 'lightness' of its tubing is merely relative to some unknown standard." Ex. 2021, ¶103. These arguments are red herrings. When considering the structural designs in

Denk and Valat, a POSITA would not look for the actual weights of the tubes in Denk and Valat to compare. Rather, a POSITA would have understood the design principles of Denk and Valat and then would have used those design principles and common knowledge to design a steerer tube of appropriate weight and strength as I explained in my prior Declaration. For example, Denk teaches “for the same overall strength and rigidity, the weight may be reduced, or for the same weight, the strength and rigidity may be significantly increased in the load direction specified by the design.” Denk, col. 2; *see also* Galasso, 1:49-60 (teaching tuning or adjusting the reinforcement in a chosen direction as desired). Indeed, Dr. Parnell acknowledges that “[t]he strengths and weights of steerer tubes and forks depend on many factors including material properties and specific geometry.” Ex. 2021, ¶106. Thus, comparing the weight and/or strength of the steerer tubes in Valat and Denk out of the context of a particular use case would be pointless.

61. I was advised by counsel that a POSITA is a person of ordinary creativity with common knowledge and common sense. A POSITA with knowledge of the actual load requirements of a steerer tube, would have understood how to apply the design principles taught in Valat and Denk and arrive at a suitable design. A POSITA would have used ordinary skills to perform the routine experimentation and calculations, as I did in my prior Declaration, using formulas well known in mechanical

engineering to compare design options and performance and arrive at a design that satisfies the requirements of a particular use case. Ex. 1003, ¶132; Exs. 1016, 1017.

VIII. Petitioner’s Combinations Disclose or Render Obvious the Claimed Upper Section and Lower Section of Claims 2–4, 6–8, 16–20, 22, 27–29, 36–38, 40, 42, 47–49, and 61–63

A. Denk alone, or in view of Moechnig, renders obvious “an outer diameter of the lower section of the body is greater than an outer diameter of the upper section of the body”

62. As discussed above, the prior art combinations in the Petition rely on Moechnig mainly for its disclosure about the conventional manner of mounting a steerer tube. And as I discussed in my prior Declaration, Denk’s tubular component, when implemented as a steerer tube in view of Moechnig, has two sections joined to each other over a tapering region. Ex. 1003, ¶¶73-80. Dr. Parnell opines that “Denk explicitly states that all cross sections are identical, and therefore, there can be no taper,” relying on Denk’s disclosure that “[i]n the exemplary embodiments shown in Figs. 1a through 1h, the adjacent cross sections of the tubular body are identical; i.e., each cross section perpendicular to the line 2 has the same cross section.” Ex. 2021, ¶¶111-113 (citing Denk, Ex. 1006, col. 8). I disagree.

63. First, as acknowledged by Dr. Parnell, **Figure 1l shows a taper**. Ex. 2021, ¶111. Second, in addition to disclosing a tube having same cross sections along its length, Denk also discloses that “within the scope of the invention it is also possible for adjacent cross sections to have a different design,” and one approach is to

continually change the cross sections in the longitudinal direction. Denk, col. 8. Based on Denk's teaching of changing the cross-sections in the longitudinal direction, a POSITA would have understood Figure 11 as disclosing a tube having two sections joined to each other over a tapering area, one section having a larger outer contour than the other section. And a POSITA would have known based on general knowledge to orient the tapered tube so that the larger diameter is in the lower section of the tubing, as shown in Valat and Moechnig.

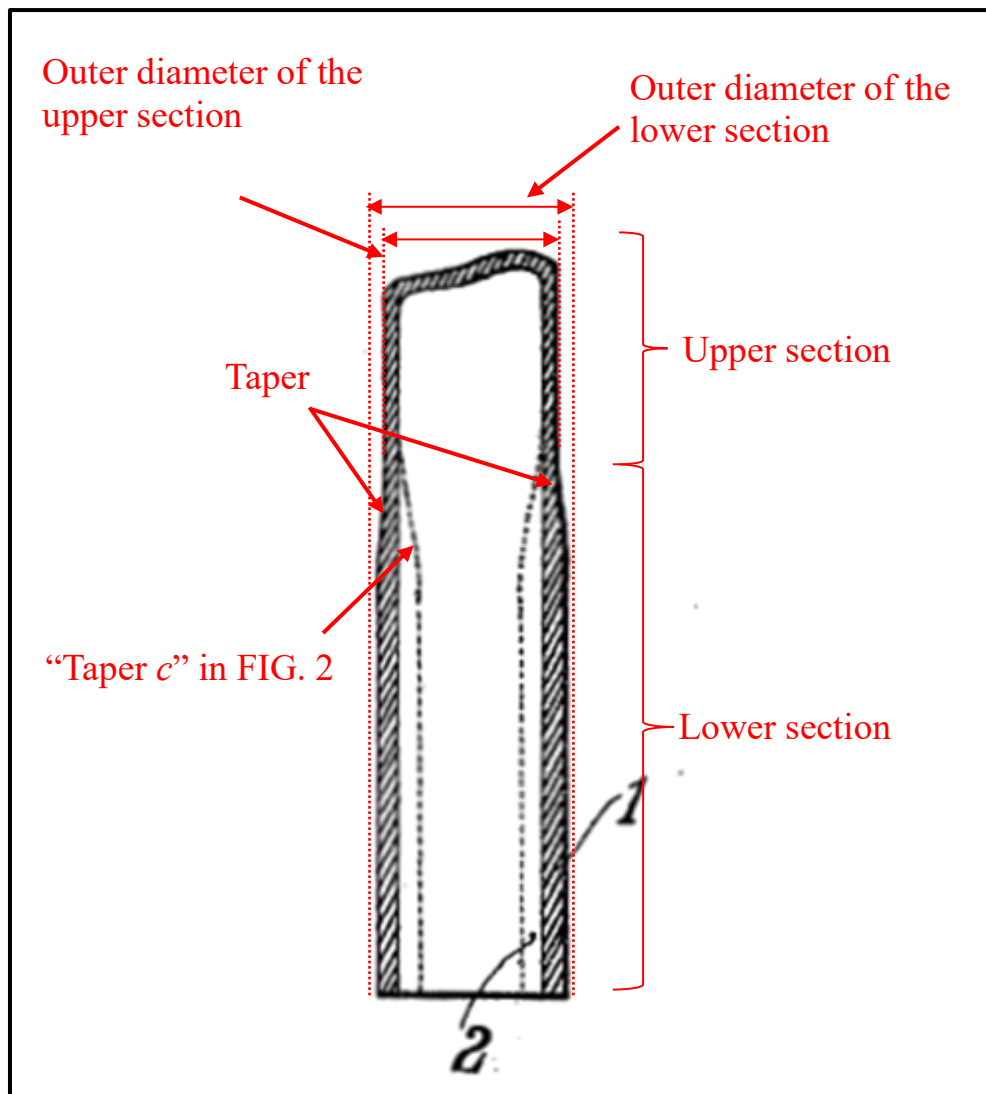
64. Dr. Parnell further opines that "[e]ven if Denk did disclose a tapered tubing (which it does not), Petitioner fails to show that Denk discloses or renders obvious orienting the tapered tubing so that the larger diameter is in the lower section of the tubing." Ex. 2021, ¶¶116-119. I disagree. As I explained in my prior Declaration, a POSITA would have found it obvious that the section of Denk's tube having the larger outer contour would have been the lower section of the steerer tube when mounted on a bicycle because the larger outer contour allows for additional reinforcement, such as a thicker wall, in the lower section, which is subjected to more loads or stresses. Ex. 1003, ¶¶59, 75, 98. Dr. Parnell opines that this is conclusory and without any explanation or support. Ex. 2021, ¶117. But I have cited prior art references that evidence the common knowledge that the lower section of the steering tube is subject to higher loads and greater diameter in the lower section

of the steerer tube would reinforce the lower section against the higher loads. For example, I have cited Schroeder, which discloses that a steerer tube having an upper section with thinner wall and a lower section with thicker wall would advantageously improve the mechanical strength of the steerer tube in the lower section, while reducing overall weight of the tube. Schroeder, 6:16-26, FIGS. 1B-2; Ex. 1003, ¶¶53, 75. I have also cited Valat, which teaches having greater thickness at lower part *a* of the steerer tube (where the loads are greatest) than in the upper part *b*. Valat, 1:70-78, Fig. 1. Moechnig also shows a steerer tube having “an outer diameter of the lower section of the body is greater than an outer diameter of the upper section of the body.” See Moechnig, Figs. 2 and 3. And Denk expressly discloses adapting the wall thickness of the tube body to the required strength and rigidity properties in the longitudinal direction. Denk, cols. 3, 9. Thus, a POSITA having the common knowledge of steerer tubes would have mounted Denk’s tube section having the larger outer diameter as the lower section.

B. Valat discloses “an outer diameter of the lower section of the body is greater than an outer diameter of the upper section of the body”

65. Dr. Parnell opines that Valat’s steerer tube has a constant outer diameter. Ex. 2021, ¶110. As discussed above, Dr. Parnell incorrectly considers Valat as disclosing only one embodiment. But Valat in Figure 1 discloses a steerer tube having a lower section and an upper section joined via a tapering region, the lower

section having an outer diameter greater than that of the upper section (Ex. 1003, ¶¶181-183, 195-196), as illustrated below.



Valat, Fig. 1 (annotations added). In fact, as shown above, a POSITA would have understood that the area of the lower section joining the upper section is a taper and is symmetrical to the taper *c* shown in Figure 2. Valat, 1:77-78, FIG. 2.

66. As explained above and in my prior Declaration, the proposed modification is to modify Valat's thicker wall in the lower section **of the first configuration as shown in Figure 1** to have Denk's inner elliptical cross-section, instead of Valat's helical ribs, to reinforce the areas of the wall in the vertical plane of travel where the loads are highest (while maintaining light weight), as taught in Denk. Ex. 1003, ¶¶155-159, 188-189. Because Valat's steerer tube as shown in Figure 1 would have been modified to have Denk's inner elliptical contour using processes other than swaging (for example, machining), the thicker wall in the lower section of Valat's steerer tube (modified in view of Denk) would continue to have "an outer diameter of the lower section of the body is greater than an outer diameter of the upper section of the body." Dr. Parnell's contrary argument is based on Valat's configuration 2 that has the inner reinforcement ribs created using a swaging technique that might have reduced the outer diameter of the lower section. Thus, Dr. Parnell's argument does not address the proposed combination and is unavailing.

IX. Petitioner's Combinations Disclose or Render Obvious the Claimed Inner Circular Cross-Section in the Upper Section of Claims 6, 10, 20, 24, 40, and 44

1. Valat discloses an inner circular cross-section in the upper section of the tube

67. As explained in my prior declaration, Valat discloses the "inner surface of the upper section is circular in cross section." Ex. 1003, ¶¶214-216. Dr. Parnell opines

Figure 2 of Valat does not clearly show the inner surface is circular or has another shape. Ex. 2021, ¶¶122-123. I disagree. As explained above and in my prior Declaration, Valat's thicker wall in the lower section of the first tube configuration (shown in Figure 1) is modified to have Denk's elliptical inner cross-section. I used Figure 2, which is a top view of Valat's tube with reinforcement ribs, to show the inner circular cross-sectional shape of the upper section because Valat's reinforcement ribs die away towards the upper section, so the inner wall of the upper section in both configurations (Figures 1 and 2) remain the same (circular). Valat, 1:86-90. That is, a POSITA would have understood that the reinforcement ribs are only provided in the lower section, and without the reinforcement ribs, the inner cross-section of the upper section of Valat's steerer tube would be circular. And as I have explained in my prior Declaration, both Denk and Schroeder further suggest having an elliptical inner cross-section in a lower section, which transitions to a circular inner cross section in the upper section of the tube. Ex. 1003, ¶216. Thus, it would only require ordinary skill of a POSITA to modify the lower part of Valat's steerer tube with Denk's elliptical inner cross-section, which would transition into a circular inner cross-section in the upper section of Valat's tube. In other words, because the upper sections of the Figure 1 and Figure 2 configurations are same, the

inner circular cross-sectional shape of the upper section in Figure 2 also applies to Figure 1.

2. Denk in view of Moechnig renders obvious an inner circular cross-section in the upper section of the tube

68. Denk and Moechnig renders obvious having an elliptical inner cross-section in a lower section, which transitions to a circular inner cross section in the upper section of the tube. Ex. 1003, ¶¶117-121. Dr. Parnell opines that I did not provide explanation or evidence for why a POSITA would have arrived at this claimed design from Denk's teaching. Ex. 2021, ¶¶127-131. I disagree.

69. As I have explained, Denk teaches that the elliptical inner cross section can transition to a circular inner cross section in the longitudinal direction to adapt to the actual requirement of strength and rigidity. Denk, cols. 2-3, 6, 8, 11; Ex. 1003, ¶118. Therefore, Denk suggests an inner circular cross-section in the upper section of the tube.

70. Moechnig also discloses that an elliptical cross-section in a lower section transitions to a circular inner cross-section in the upper section of the steer tube. Moechnig, [0035]-[0036], [0038], FIGS. 1-4; Ex. 1003, ¶119. Based on the teachings of Denk and Moechnig, a POSITA would have understood that it would have been a suitable design choice for Denk's steerer tube to have the elliptical inner cross section in the lower section, and to transition into a circular inner cross section

in the upper section, similar to Moechnig. A POSITA would have understood that such design would provide the benefit of adapting the thickness of the tube to the loads experienced by the steerer tube. Denk, cols. 1-2. That is, Denk's elliptical design would have been added only to the lower section where the loads are greatest (not to the upper section which would have remained circular), and this would have "simultaneously achieve the advantage of reduced weight," and "improved mechanical strength." Schroeder, 6:16-26; *see also* Valat, 1:70-78, 1:86-90; Ex. 1003, ¶120.

71. Indeed, steerer tubes having thicker wall in the lower section and thinner wall in the upper section to reduce weight were conventional and well known in the art. *See* Valat, 1:35-51, 1:70-78, Figs. 1-2; Schroeder, FIGS. 1A-2, 6:1-26 (both teaching reinforcing the lower section of the tube to adapt to the higher loads in the lower section); Ex. 1003, ¶¶120-121. Similarly, it would have been an obvious design choice to have an elliptical inner contour in the lower section of Denk's tube and a circular inner contour in the upper section.

X. Claims 56 and 59: A POSITA would have understood that in the prior art combinations, the major and minor diameters of the elliptical inner cross-section would decrease in the tapering region, as shown by Moechnig

72. Dr. Parnell opines that Moechnig does not motivate a POSITA to have a tapering region in the lower section. *See* Ex. 2021, ¶136. This argument is misplaced

because both Denk and Valat already disclose a tapering region. As discussed above, Denk alone or in view of Moechnig renders obvious a steerer tube having a lower section joined to an upper section over the tapering area. Denk discloses that the tube has an inner elliptical cross-sectional contour in the lower section and suggests a circular inner cross-section in the upper section. Valat in view of Denk also renders obvious a steerer tube having a lower section and an upper section joined to the lower section via a tapering region, the lower section having an inner elliptical cross section and the upper section having a circular inner cross section. It would have been obvious to a POSITA that when the inner elliptical contour transitions over the tapering region to a circular inner cross section, both the major and minor diameters of the elliptical inner cross section would necessarily decrease over the tapering region and would become equal, which would be the inner diameter of the upper section.

73. Further, Moechnig teaches that the minor and major diameters of the elliptical lower section of the steerer tube body decrease as a function of proximity to the upper section of the body. *See* Ex. 1003, ¶¶137-138. In view of Moechnig's teaching and based on common knowledge and common sense, a POSITA would have understood that in Denk and Valat (modified in view of Denk), both the major and the minor diameters in the tapering region of the lower section would decrease as a

function of proximity to the upper section of the body. *Id.* Moechnig is objective evidence of how a POSITA would have understood the effect of the tapering area on the major and minor diameters of the inner elliptical cross-sectional contour, i.e., the major and minor diameters in the taper region of the lower section would decrease as a function of proximity to the upper section of the steerer tube.

XI. Conclusion

74. For the reasons explained in my prior Declaration and above, every element of the Challenged Claims of the '993 patent is disclosed by Denk in view of Moechnig with or without Schroeder, or Valat in view of Moechnig and Denk with or without Schroeder. Moreover, it would have been obvious to a POSITA to combine the teachings of Denk and Valat with those of Moechnig and Schroeder to arrive at the purported invention recited in the '993 patent. A POSITA would have been motivated to make the modifications and/or combinations; doing so would have required only routine engineering skill and knowledge; and the modifications and/or combinations would have yielded predictable results.

75. Moreover, I am not aware of any secondary indicia of non-obviousness tied to the claimed invention that would alter my opinion that the Challenged Claims would have been obvious to a POSITA at the time of the purported invention.

76. I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct, that all statements made herein of my

knowledge are true, and that all statements made on information and belief are believed to be true, and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Respectfully submitted,

A handwritten signature in black ink, consisting of several loops and a long horizontal stroke extending to the right.

Dated: January 23, 2025

By: _____
Alexander H. Slocum, Ph.D.