

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

PRINCETON CARBON WORKS INC.,
Petitioner,

v.

METRON IP LIMITED,
Patent Owner.

IPR2022-00082
Patent 10,611,188 B2

Before RICHARD H. MARSCHALL, FREDERICK C. LANEY, and
BRENT M. DOUGAL, *Administrative Patent Judges*.

DOUGAL, *Administrative Patent Judge*.

DECISION

Denying Institution of *Inter Partes* Review
35 U.S.C. § 314, 37 C.F.R. § 42.4

I. INTRODUCTION

A. *Background and Summary*

Petitioner, Princeton Carbon Works Inc., requests that we institute an *inter partes* review to challenge the patentability of claims 1–8 and 10–13 (the “challenged claims”) of U.S. Patent 10,611,188 B2 (Ex. 1001, “the ’188 patent”). Paper 1 (“Pet.”). Patent Owner, Metron IP Limited, argues that Petitioner’s request is deficient and should not be granted. Paper 6 (“Preliminary Response” or “Prelim. Resp.”). With our authorization, Petitioner filed a Reply (Paper 11, “Reply”) to Patent Owner’s Preliminary Response, and Patent Owner filed a Sur-reply (Paper 12, “Sur-reply”) to Petitioner’s Reply.

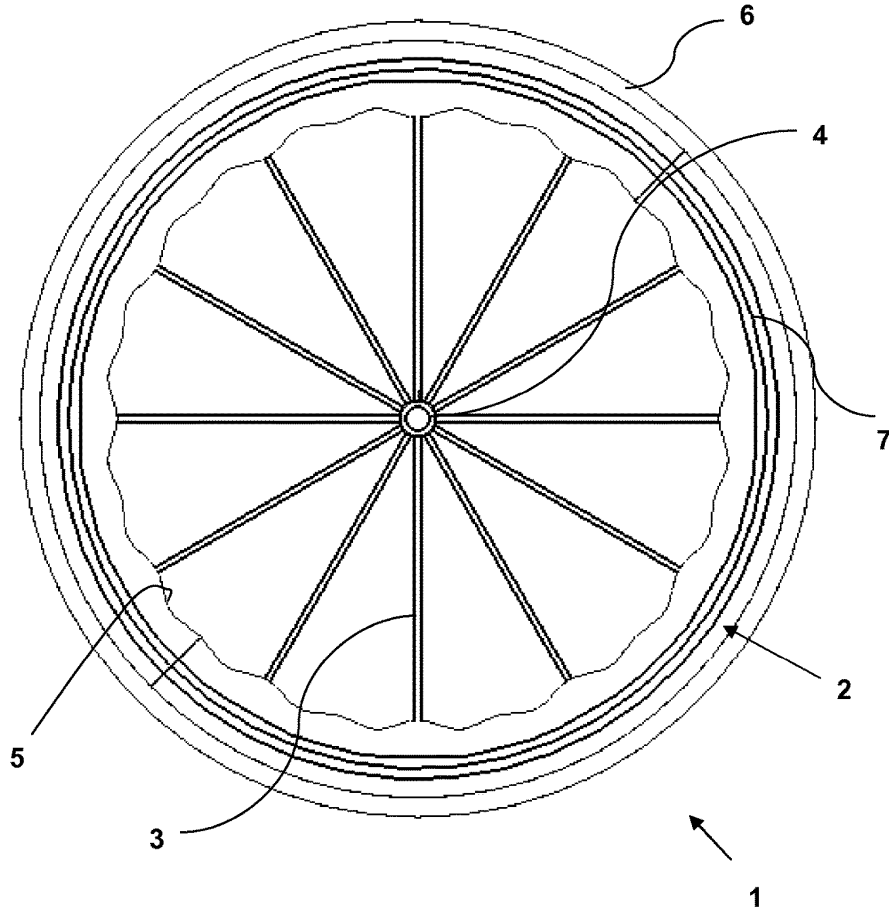
Applying the standard set forth in 35 U.S.C. § 314(a), which requires demonstration of a reasonable likelihood that Petitioner would prevail with respect to at least one challenged claim, we deny the Petition and decline to institute an *inter partes* review.

B. *Related Matters*

The parties identify the following related district court litigation: *SRAM, LLC v. Princeton Carbon Works Inc.*, No. 21-80581-CIV-ALTMAN (S.D. Fl.). Pet. 2; Paper 4, 2. Patent Owner also identifies the following related *inter partes* review: IPR2022-00078. Paper 4, 2.

C. *The ’188 Patent*

The ’188 patent is entitled “Bicycle Wheels” relates to bicycle wheels having a rim with an undulating configuration. Ex. 1001, codes (54), (57). Embodiments of the undulating configuration of the rim can be seen in Figure 1 reproduced below.



As can be seen in Figure 1, above, a bicycle wheel 1 has an annular rim 2, elongate spokes 3 and a central hub 4. *Id.* at 7:61–63. The rim 2 has an inner surface 5 with a plurality of elevations, such as support elevations “which are located in the region of connection of each spoke” and ancillary elevations “which are located between the support elevations.” *Id.* at 8:36–41. The elevations “provide a regularly undulating inner surface of the rim.” *Id.* at 8:43–45.

D. Illustrative Claim(s)

Petitioner challenges claims 1–8 and 10–13 of the ’188 patent. Claim 1 is the sole independent claim and is illustrative:

1. A wheel for use with a bicycle, the wheel comprising:
a hub for mounting the wheel to a bicycle;

a rim about which a tire is mountable; and
a plurality of spokes extending between the hub and the rim,
wherein at least part of a radially inner edge of the rim has an
undulating curve configuration, the undulating curve
configuration having peaks and troughs, and
wherein the radially inner edge has convex profiles in convex
regions of the rim, the convex regions including the peaks.

Ex. 1001, 11:8–18.

E. Prior Art and Asserted Grounds

Petitioner asserts the following grounds of unpatentability (Pet. 52),
supported by the declaration of Ronald E. Hanson, Ph.D. (Ex. 1002):

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–8, 10–13	102 ¹	Carlson ²
1–8, 10–13	103(a)	Carlson, Zibkoff ³
1–8, 10–13	103(a)	Herting, ⁴ Zibkoff

1. Carlson

Carlson is directed to a bicycle wheel, and in particular to aspects of
the wheel relating to the spokes. Ex. 1007 ¶¶ 1, 10–25. As illustrated below
in Figure 1, Carlson shows bicycle wheel 10 with spokes 14 extending
between hub 12 and rim 16. *Id.* ¶ 47.

¹ Because the challenged claims appear to have an effective filing date
before March 16, 2013, we apply the version of 35 U.S.C. §§ 102–103 in
effect before the adoption of the Leahy-Smith America Invents Act (“AIA”),
Pub. L. No. 112-29, 125 Stat. 284, 285–88 (2011).

² U.S. Patent Pub. 2005/0242658 A1, pub. Nov. 3, 2005 (“Carlson”) (Ex.
1007).

³ U.S. Patent Pub. 2009/0236902 A1, pub. Sept. 24, 2009 (“Zibkoff”) (Ex.
1008).

⁴ U.S. Patent 6,425,641 B1, issued July 30, 2002 (“Herting”) (Ex. 1006).

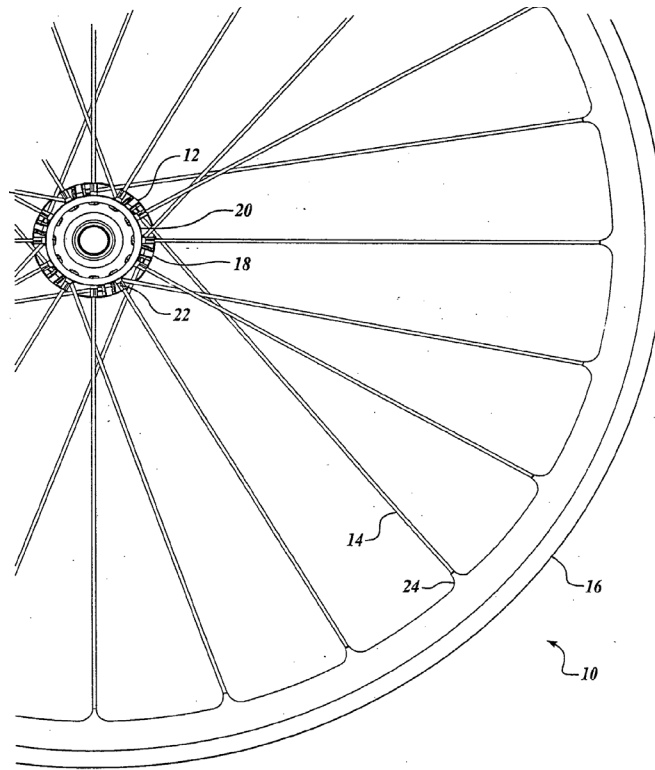


Fig. 1

The bicycle wheel of Figure 1 above, also shows spoke mounts 24 in rim 16. A detail of a spoke mount is illustrated in Figure 7 below.

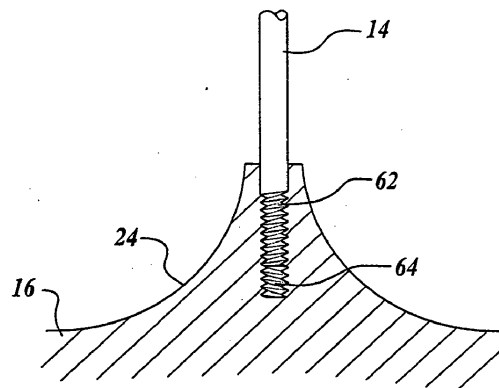


Fig. 7

In the detail view of Figure 7 above, spoke 14 is shown in threaded engagement with spoke mount 24. *Id.* ¶ 56. It can be seen that spoke mount 24 is formed with two concave sides that rise to a flat top and the spoke is mounted in the flat top. Figure 7 also illustrates one of the benefits claimed

by Carlson, which is that the mounting hole in the spoke mount does not pass all the way through a wall of the rim. *See id.* at code (57), ¶ 11.

Notably, Carlson does not discuss the aerodynamics of the bicycle wheel. Carlson does discuss adding ferrule 66 at the spoke mount so that there is “a smooth aerodynamic transition” between the spoke mount and the spoke. *Id.* ¶ 59. The ferrule illustrated by Carlson effectively makes the flat top of the spoke mount rise to more of a point to provide a less abrupt transition. *See id.* at Fig. 10.

2. Herting

Herting is directed to a bicycle wheel, and in particular to aspects of the wheel relating to the spokes. Ex. 1006, 1:25–30. As illustrated below in Figure 3, Herting shows a wheel rim with flanges 34 extending around the inner circumference in a “scalloped configuration to define alternating peaks and valleys.” *Id.* at 2:59–65.

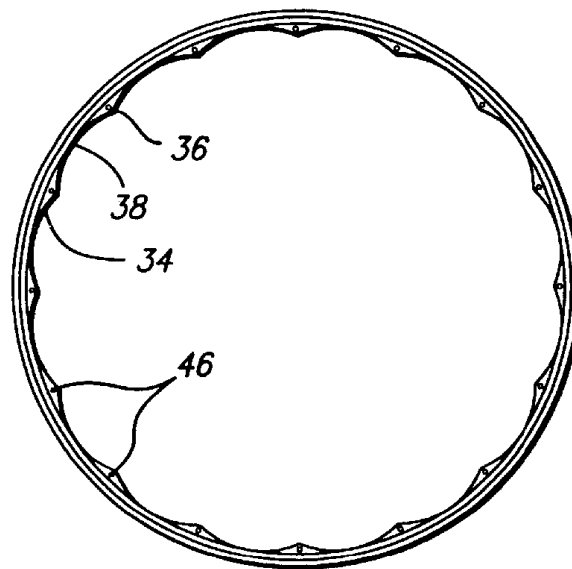


FIG. 3

The bicycle wheel rim of Figure 3 above, also shows apertures 46 in the flanges for receiving spokes.

Herting teaches that:

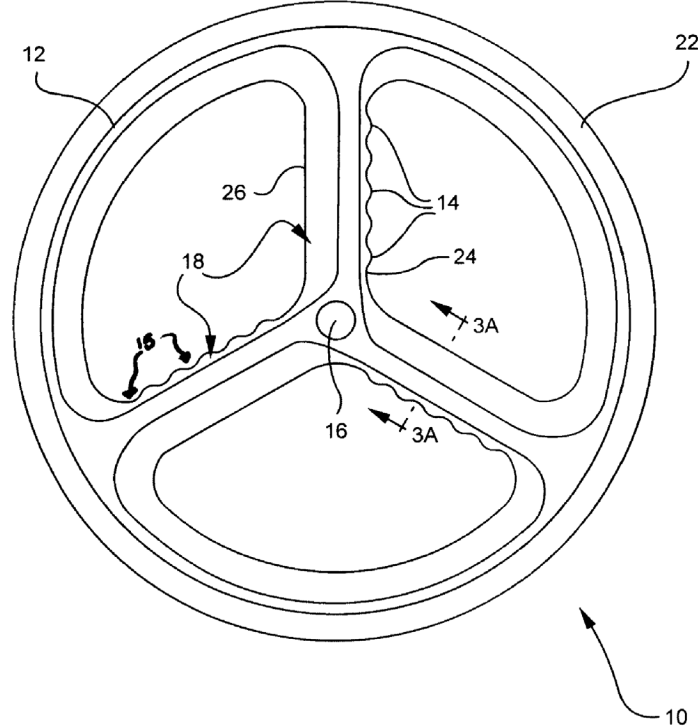
The primary objective of the invention is to provide a sturdy easy to manufacture lightweight cycle rim which is less susceptible to distortion than prior art rims particularly for tubeless inflatable tires in which spokes interconnecting the rim to a hub portion of the cycle wheel can be replaced without deflating or dismounting the tire.

Id. at 1:25–30.

It is also notable that Herting does not discuss the aerodynamics of the bicycle wheel.

3. Zibkoff

Zibkoff is directed “to bicycle wheels and more precisely to the spokes of aerodynamic bicycle wheels.” Ex. 1008 ¶ 3. As illustrated below in Figure 3, Zibkoff shows bicycle wheel 10 with spokes 18 extending between hub 16 and rim 12. *Id.* ¶ 45.



The bicycle wheel of Figure 1 above, also shows aerodynamic protrusions 14 and valleys 15 on leading edge 24 of spokes 18. Zibkoff also teaches that:

airflow around an aerodynamic protrusion disposed on a leading edge of a spoke of the wheel is disrupted into a plurality of airflows forming a first vortex about a first valley associated with the protrusion and a second vortex about a second valley associated with the protrusion. The plurality of airflows are joined at the trailing edge of the spoke.

Id. at code (57).

II. ANALYSIS

A. *Legal Standards*

Petitioner bears the burden to demonstrate unpatentability. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). At this preliminary stage, we determine whether the information presented in the Petition shows a reasonable likelihood that Petitioner would prevail in establishing that at least one of the challenged claims would have been obvious over the proposed combinations of prior art. *See* 35 U.S.C. § 314(a).

“A claim is anticipated [under 35 U.S.C. § 102] only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. Inc. v. Union Oil Co.*, 814 F.2d 628, 631 (Fed. Cir. 1987). Moreover, “[b]ecause the hallmark of anticipation is prior invention, the prior art reference—in order to anticipate under 35 U.S.C. § 102—must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements ‘arranged as in the claim.’” *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008). Whether a reference anticipates is assessed from the perspective of an ordinarily skilled artisan. *See Dayco Prods., Inc. v. Total Containment, Inc.*, 329 F.3d 1358, 1368 (Fed. Cir. 2003) (“[T]he dispositive question regarding anticipation [i]s whether one

skilled in the art would reasonably understand or infer from the [prior art reference's] teaching' that every claim element was disclosed in that single reference.'").

A claim is unpatentable as obvious under 35 U.S.C. § 103(a) if “the differences between the subject matter sought to be patented 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) (quoting 35 U.S.C. § 103(a)). We resolve the question of obviousness based on underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the prior art and the claims; (3) the level of skill in the art; and (4) when in evidence, objective indicia of nonobviousness. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

We apply these principles to the Petition’s challenges.

B. Level of Ordinary Skill in the Art

We review the grounds of unpatentability in view of the understanding of a person of ordinary skill in the art at the time of the invention. *Id.* at 13, 17. Petitioner asserts that a person of ordinary skill in the art “would have a master’s degree or PhD in mechanical or aerospace engineering or a related field, or would have equivalent work experience in the field of aerodynamics.” Pet. 8–9 (citing Ex. 1002 ¶ 21).

Patent Owner argues for a slightly different level of skill and that Petitioner’s proposed level of skill excludes the inventor of the ’188 patent:

A person of ordinary skill in the art in early 2011 would have at least (1) a bachelor’s degree in mechanical engineering or an equivalent degree in the aerodynamics or fluid dynamics fields plus one or more years of experience in the design work

related to aerodynamics or fluid dynamics or bicycle component design relating to aerodynamics; (2) a Master's or Ph.D. degree in mechanical engineering or in the fields of aerodynamics or fluid dynamics plus a strong understanding of mechanical design principles; or (3) the equivalent work experience in the fields of aerodynamics or fluid dynamics or bicycle component design relating to aerodynamics. *See* Ex. 2011, ¶35; *id.* at 124-25. . . .

Notably, Princeton's expert Dr. Hanson's proposed definition of the level of ordinary skill (Ex. 1002, ¶ 21) would appear to exclude Dimitrios Katsanis, the inventor of the '188 Patent, from being considered a person of ordinary skill in the art because Mr. Katsanis only possessed a bachelor's degree in engineering at the time of the '188 Patent invention even though he was a bicycle wheel and component designer for years. There should be no doubt that Mr. Katsanis was at least a person of ordinary skill in the art at the time of the invention. *See* Ex. 2011, ¶¶37-38; *id.* at 125.

Prelim. Resp. 38–39.

At this stage of the proceeding, and on this record, we determine it is unnecessary to resolve any differences in the parties' definitions of the level of ordinary skill in the art, as any distinction does not impact our Decision.

C. Claim Construction

In *inter partes* review, we construe claims 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) (2020).

Petitioner asserts that no terms require express construction at this stage, and Patent Owner does not argue otherwise. Pet. 24; *see generally* Prelim. Resp. We agree. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (“[W]e need only construe

terms that are in controversy, and only to the extent necessary to resolve the controversy.”) (internal quotation omitted).

D. 35 U.S.C. §§ 102, 103(a) – Carlson and Zibkoff

Petitioner argues that Carlson alone anticipates, or the combination of Carlson and Zibkoff renders obvious claims 1–8 and 10–13. Pet. 41–52, 69–86. Patent Owner argues against the references. Prelim. Resp. 40–49, 55–63. Patent Owner relies on the Declaration of Dr. Laurens Howle for support. Ex. 2011. For the reasons expressed below, we determine that Petitioner has not established a reasonable likelihood of succeeding in showing that claims 1–8 and 10–13 are unpatentable.

1. Analysis of Claim 1

Petitioner argues that Carlson teaches or suggests all elements of claim 1 and in the alternative, the combination of Carlson and Zibkoff teaches all elements of claim 1. Pet. 41–52, 69–74. For our discussion, we focus on the requirement of claim 1 that:

- 1) at least part of a radially inner edge of the rim has an undulating curve configuration, the undulating curve configuration having peaks and troughs, and
- 2) . . . the radially inner edge has convex profiles in convex regions of the rim, the convex regions including the peaks.

a) Carlson Alone

Concerning Carlson alone, Petitioner argues that Carlson’s flat top of the spoke mount is part of “an undulating curve configuration” with convex peaks. Pet. 71. We disagree.

Petitioner points to Carlson Figure 9B as showing these claim elements. *Id.* We reproduce this figure below.

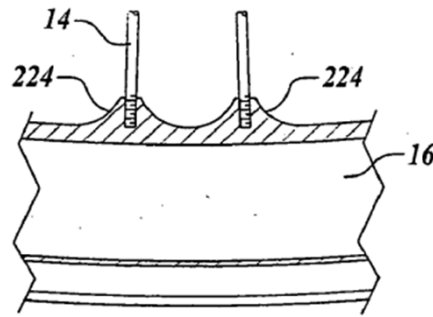


Fig. 9B

Carlson Figure 9B shows a portion of a bicycle rim. For the “undulating curve configuration” Petitioner argues that “the radially inner edge of *Carlson’s* Figure 9B has an undulating curve configuration with peaks and valleys formed by the spoke mounts 224 and the spaces therebetween.” Pet. 71 (citing Ex. 1007 ¶ 58). Then for the convex peaks, Petitioner argues that “Figure 9B further illustrates that the radially inner edge of the rim 16 has convex profiles in convex regions with the spoke mounts 224 (corresponding to the recited peaks). *Id.* (citing Ex. 1002 ¶¶ 142–143).

Petitioner fails to explain how the peaks at spokes 14 which are flat, show an undulating curve configuration or a convex peak. Figure 9B appears to show a curve from the trough to the peak, followed by a flat line at the peak, and then a curve from the peak to the trough. Without further explanation it is not clear how this configuration is an undulating curve or a convex peak. Further, the cited figures do not establish sufficiently that the spoke mounts have an undulating curve configuration or a convex peak.

Next, Petitioner argues that Carlson also teaches that “each spoke mount 324 can also include a cone-shaped ferrule for a smooth aerodynamic transition.” *Id.* at 69–70 (citing Ex. 1007 ¶ 59). Petitioner argues that the “spoke mounts 324 and the ferrules 66 also provide an undulating curve

configuration that has convex profiles in convex regions of the spoke mounts 324.” *Id.*

Both Carlson’s Figure 10 and Petitioner’s drawing (Pet. 72) in the Petition of a ferrule show the ferrule having a flat top. Petitioner fails to explain how these flat tops show an undulating curve configuration or a convex peak.

We further note that Carlson teaches that the ferrules are separate pieces that are “slid on the spoke” such that after the spoke is threaded “within [the] spoke mount . . . a wide end [of the ferrule] abuts the inward end [i.e. flat top] of [the] spoke mount.” Ex. 1007 ¶ 59. Thus, Carlson does not appear to teach that the ferrules are part of the rim and Petitioner’s reliance on the ferrules for support of Carlson teaching a rim having an undulating curve configuration or a convex peak is misplaced.

Petitioner also states that a licensee of the ’188 patent offered Figure 9 of that patent “as an embodiment of the ’188 Patent claims” in the infringement contentions in the parallel district court proceeding. Pet. 72 (citing Ex. 1025; Ex. 1026, 1). Petitioner then argues that “*Carlson’s* spoke mounts (with or without a ferrule) are, effectively, identical to the configuration depicted in Figure 9 of the ’188 patent.” *Id.* (citing Ex. 1002 ¶ 146). We reproduce Figure 9 of the ’188 patent below.

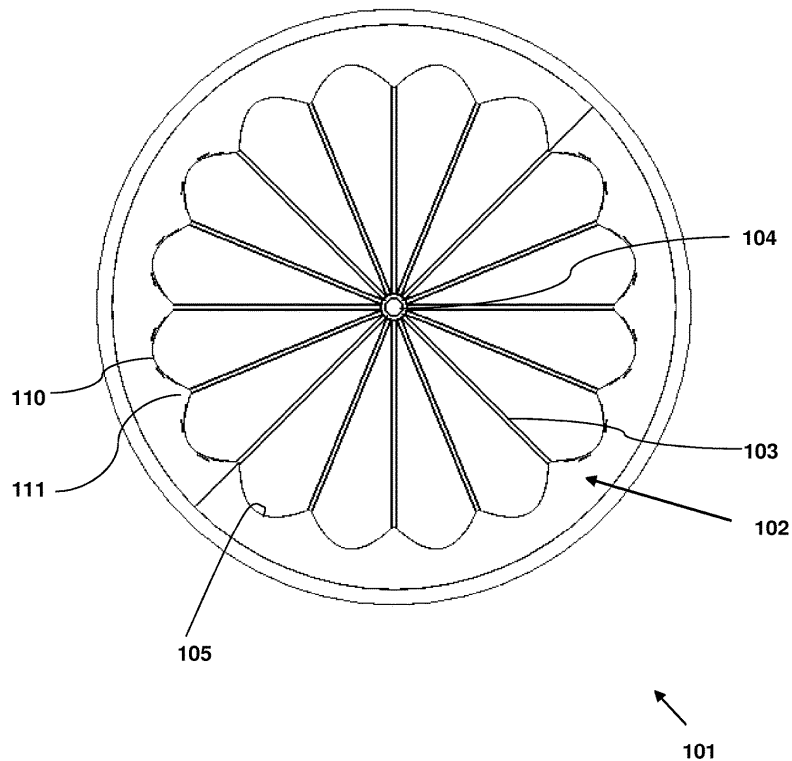


Figure 9 of the '188 patent shows a bicycle wheel with a rim having an undulating profile.

Other than referring to the figure, Petitioner does not explain why the inner rim profiles are the same. Pet. 72–73. We first note that the exact profile of the peaks in Figure 9 of the '188 patent is not clear. It does appear to show an undulating curved configuration, but we decline to determine based on the current record whether or not one of skill in the art would consider this Figure as showing convex peaks. At the same time, it is not clear that the inner rim profiles of Figure 9 of the '188 patent and Carlson's Figure 9B are the same. In particular, it is not readily apparent that Figure 9 of the '188 patent shows the same flat tops of the peaks as taught by Carlson. Even if Figure 9 did show flat tops, the statement of a litigant in district court litigation does not bind us here. We note that other figures of

the '188 patent clearly show a rim having convex peaks covered by the claim limitation. *See, e.g.*, Ex. 1001, Figs. 1, 5.

For all of these reasons, and based on the current record, we determine that the Petition fails to show a reasonable likelihood that Carlson teaches all of the features of claim 1.

b) Carlson and Zibkoff

Petitioner also argues that the combination of Carlson and Zibkoff teaches the “undulating curved configuration” and “convex peak” limitations of claim 1. Pet. 41–52, 73–74. The Petition explains that “*Carlson’s* undulating configuration [of the rim] would be modified to incorporate the shape of *Zibkoff’s* scallop-shaped, aerodynamic protrusions [from Zibkoff’s spokes].” *Id.* at 41 (citing Ex. 1002 ¶ 91).⁵

As for the reasoning for the combination, Petitioner argues that “*Carlson and Zibkoff* both state a desire to improve the aerodynamics of bicycle wheel components and disclose structures to do so.” *Id.* at 45. However, Petitioner overstates the teachings of the references. For example, Carlson does not discuss the aerodynamics of the bicycle wheel. The only statement about aerodynamics in Carlson is that adding a ferrule can provide “a smooth aerodynamic transition” between the spoke mount and the spoke. Ex. 1007 ¶ 59.

Petitioner states that “*Zibkoff* explains that its “aerodynamic ***scallop-shaped protrusion*** 14 and antipodean valley 15 may be configured to ***provide aerodynamic benefit*** to the spoke 18.” Pet. 45 (quoting Ex. 1008 ¶

⁵ We do not address Petitioner’s argument that Carlson’s ferrules would have been modified in view of Zibkoff’s teachings (Pet. 41–52, 73–74), for as discussed above, Carlson does not teach that the ferrules are part of the rim.

51). Petitioner then asserts that it would have been obvious to modify Carlson's rim in view of Zibkoff because "the trailing and leading edges of *Carlson's* rim are subject to the same air forces as the leading and trailing edge of *Zibkoff's* spoke." *Id.* at 48; *see also* Ex. 1002 ¶¶ 98–100.

Petitioner's reasoning that the air forces at Carlson's rim are the same as those at Zibkoff's spoke is that air flows across the spoke and air flows across the rim, and they both have leading and trailing edges. Pet. 46–48. Petitioner supports its reasoning by citing to its expert and to the '188 patent. *Id.* at 46–50; Ex. 1002 ¶¶ 98–102. Petitioner's declarant repeats the same reasoning as Petitioner, which we determine to be conclusory.

This analysis fails to address the differences in air flow experienced at the rim versus the spoke, for example due to the fact that the rim is spaced further away from the hub or differences based on rotation or the differences based on the shape and positioning of the leading and trailing edges. *See* Prelim. Resp. 47; Ex. 2011 ¶¶ 69–70, 73.

Further, it is not clear from Petitioner's analysis which edge of a rim Petitioner is considering to be the leading edge and which edge is the trailing edge. Pet. 47–48. Petitioner's identification involves a box surrounding a section of rim including both the inner rim and the outer rim and an arrow pointing to the box. *Id.* For Carlson, the Petition includes two figures of Petitioner's own creation, each with a box surrounding the same section of rim, with arrows to indicate airflow and an arrow pointing to the box with the words "leading edge" or "trailing edge." *Id.* It is not clear whether Petitioner's analysis is for one section of the rim, or two different sections. If the analysis is for one section, the analysis fails to discuss the bicycle tire which is attached to the rim and what affect that has on the air flow when compared to the leading and trailing edges of Zibkoff's spokes, which have

no tire surrounding one of its edges. If it is for two opposing sections, the analysis fails to discuss the spokes and hub in-between the two sections and what affect they have on the air flow or why the mostly empty space would be similar to the spoke body in Zibkoff.

Though we agree that there maybe be similarities in the air forces at Carlson's rim and at Zibkoff's spoke, Petitioner's analysis is insufficient to establish that they are the same or similar enough that the purported air flow advantages of Zibkoff's spoke configuration apply to Carlson's rim.

Petitioner's analysis is further weakened by the fact that the only supporting reference that Petitioner identifies linking the aerodynamic benefits between the rim and the spoke is the '188 patent. *See* Pet. 48–50; Ex. 1002 ¶¶ 101–102; *see also* Prelim. Resp. 47–49. Thus, Petitioner's analysis suggests hindsight bias, and we decline to consider Petitioner's and their declarant's discussion of how the teachings of the '188 patent provide a motivation to combine Carlson and Zibkoff.

After arguing over the “aerodynamic benefits,” Petitioner then argues that “the '188 Patent describes its undulating configuration as providing lightweight, structural support for bicycle wheels” and that the combination of Carlson and Zibkoff would also provide this benefit. Pet. 50. This analysis, also based on the teachings of the '188 patent suggests hindsight bias. Further it is unclear how Petitioner's reliance on Zibkoff's teaching that “[t]he spoke 18 is configured to provide internal support to the wheel 10 and to support the hub 16,” applies to adding protrusions to the rim. Ex. 1008 ¶ 35 (cited at Pet. 50). Thus, Petitioner's statement that the “spoke and *aerodynamic protrusions* as providing ‘internal support’ to bicycle wheels and their hubs” overstates the teachings of Zibkoff. *See* Pet. 50 (emphasis added).

For all of these reasons, and based on the current record, we determine that the Petition fails to show a reasonable likelihood that the combination of Carlson and Zibkoff teaches all of the features of claim 1.

E. 35 U.S.C. § 103(a) – Herting and Zibkoff

Petitioner argues that the combination of Herting and Zibkoff renders obvious claims 1–8 and 10–13. Pet. 31–69. Patent Owner argues against this combination of references. Prelim. Resp. 40–54. Patent Owner relies on the Declaration of Dr. Laurens Howle for support. Ex. 2011. For the reasons expressed below, we determine that Petitioner has not established a reasonable likelihood of succeeding in showing that claims 1–8 and 10–13 are unpatentable.

1. Analysis of Claim 1

Petitioner argues that the combination of Herting and Zibkoff teaches all elements of claim 1. Pet. 27–37, 48–54. For our discussion, we focus on the requirement of claim 1 that:

the undulating curve configuration having peaks and troughs
. . . the radially inner edge has convex profiles in convex
regions of the rim, the convex regions including the peaks.

Petitioner argues that Herting’s rim with flanges teaches an “undulating . . . configuration having peaks and troughs.” Pet. 54–55. However, Petitioner appears to take the position that Herting does not disclose an undulating *curve* configuration having peaks and troughs or an undulating curve configuration having convex profiles including peaks. *See id.* at 56–57. Thus, Petitioner argues that it would have been obvious to modify Herting’s rim and flanges to “incorporate the teachings in Zibkoff” related to “rounded or curve peaks” and “convex exterior profiles.” *Id.* (citing Ex. 1002 ¶¶ 115–118).

The Petition explains that “*Herting*’s scallop-shaped, undulating configuration [of the rim] would be modified to incorporate the shape of *Zibkoff*’s scallop-shaped, aerodynamic protrusions [from *Zibkoff*’s spokes].” *Id.* at 31 (citing Ex. 1002 ¶ 68).

Petitioner provides essentially the same reasoning for this combination as discussed above with respect to Carlson and *Zibkoff*. The reasoning here falters for similar reasons.

Petitioner argues that “*Herting* and *Zibkoff* disclose bicycle wheels designed to increase aerodynamic flow and decrease drag.” *Id.* at 34; *see also id.* at 34 (citing Ex. 1006, 3:26–46; Ex. 1008 ¶ 32), 38 (citing Ex. 1008 ¶¶ 16–17). Petitioner overstates the teachings of the references, as both focus on spoke design in regards to aerodynamics. *See* Ex. 1006, 3:26–46; Ex. 1008 ¶ 32.

For example, Petitioner states that *Herting* teaches a flange design, which “arrangement allows ‘for reduced aerodynamic drag.’” Pet. 34 (quoting Ex. 1006, 3:26–37). However, *Herting*’s only statement about aerodynamics is that “it is possible to place the wheel spokes either outside of the flanges 44, 54 or inside of the flanges 92, 94 for reduced aerodynamic drag,” not that the flange design provides “for reduced aerodynamic drag.” Ex. 1006, 3:34–37.

Petitioner states that “*Zibkoff* explains that its “aerodynamic ***scallop-shaped protrusion*** 14 and antipodean valley 15 may be configured to ***provide aerodynamic benefit*** to the spoke 18.” Pet. 35 (quoting Ex. 1008 ¶ 51). Petitioner then asserts that it would have been obvious to modify *Herting*’s rim in view of *Zibkoff* because “they both encounter the same resistive air forces and seek to improve aerodynamic performance.” *Id.* at 37; *see also* Ex. 1002 ¶¶ 79–81.

Petitioner's reasoning that the air forces at Herting's rim are the same as those at Zibkoff's spoke is that air flows across the spoke and air flows across the rim, and they both have leading and trailing edges. Pet. 35–37. Petitioner supports its reasoning by citing to its expert and to the '188 patent. *Id.* at 35–39; Ex. 1002 ¶¶ 79–84. Petitioner's declarant repeats the same reasoning as Petitioner, which we determine to be conclusory.

This analysis fails to address the differences in air flow experienced at the rim versus the spoke, for example due to the fact that the rim is spaced further away from the hub or differences based on rotation or the differences based on the shape and positioning of the leading and trailing edges. *See* Prelim. Resp. 47; Ex. 2011 ¶¶ 69–70, 73.

Further, it is not clear from Petitioner's analysis which edge of a rim Petitioner is considering to be the leading edge and which edge is the trailing edge. Pet. 37. Like Petitioner's analysis of Carlton, Petitioner's identification of the leading and trailing edges of Herting's rim involve boxes surrounding a section of rim including both the inner rim and the outer rim and an arrow pointing to the box. *Id.* However, unlike Carlson, the Petition includes the boxes on one figure of Petitioner's own creation, with each box on opposite sides of a rim of Herting. *Id.* Thus, it would appear that Petitioner's analysis is for two different sections of the rim. However, it is still not clear whether the analysis applies to the inner edge or the outer edge of the rim or both. Further, for the two opposing sections of the rim, the analysis fails to discuss the spokes and hub in between the two sections and what affect they have on the air flow or why the mostly empty space would be similar to the spoke body in Zibkoff so that the air forces are the same. The analysis also fails to take into account how the presence of the tire on the rim alters the air flow

over the identified edges, and how that flow differs from Zibkoff's air flow over its spokes.

Though we agree that there may be similarities in the air forces at Herting's rim and at Zibkoff's spoke, Petitioner's analysis is insufficient to establish that they are the same or similar enough that the purported air flow advantages of Zibkoff's spoke configuration apply to Herting's rim.

Petitioner's analysis is further weakened by the fact that the only supporting reference that Petitioner identifies linking the aerodynamic benefits between the rim and the spoke is the '188 patent. *See* Pet. 37–39; Ex. 1002 ¶¶ 82–84; *see also* Prelim. Resp. 47–48. Thus, Petitioner's analysis suggests hindsight bias, and we decline to consider Petitioner's and their declarant's discussion of how the teachings of the '188 patent provide a motivation to combine Herting and Zibkoff.

After arguing over the “aerodynamic benefits,” Petitioner then argues that “the '188 Patent describes its undulating configuration as providing lightweight, structural support for bicycle wheels” and that the combination of Herting and Zibkoff would also provide this benefit. Pet. 39. This analysis, also based on the teachings of the '188 patent suggests hindsight bias. Further it is unclear how Petitioner's reliance on Zibkoff's teaching that “[t]he spoke 18 is configured to provide internal support to the wheel 10 and to support the hub 16,” applies to adding protrusions to the rim. Ex. 1008 ¶ 35 (cited at Pet. 39). Thus, Petitioner's statement that the “spoke and *aerodynamic protrusions* as providing ‘internal support’ to bicycle wheels and their hubs” overstates the teachings of Zibkoff. *See* Pet. 39 (emphasis added).

For all of these reasons, and based on the current record, we determine that the Petition fails to show a reasonable likelihood that the combination of Herting and Zibkoff teaches all of the features of claim 1.

F. Claims 2–8 and 10–13

Claim 1 is independent and claims 2–8 and 10–13 depend therefrom. As Petitioner has not shown a reasonable likelihood that the cited references teach or suggest all of the features of claim 1, we determine that Petitioner has not shown a reasonable likelihood that the cited references teach or suggest all of the features of the challenged claims.

III. CONCLUSION

For the foregoing reasons, we have determined that there is not a reasonable likelihood that the Petitioner would prevail with respect to at least one of the claims challenged in the Petition. Accordingly, the Petition is denied, and no trial is instituted.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that the Petition is *denied* and that no trial is instituted.

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