

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

RAVIN CROSSBOWS, LLC,
Petitioner,

v.

MCP IP, LLC,
Patent Owner.

IPR2024-00522
Patent 8,683,989 B1

Before MEREDITH C. PETRAVICK, MITCHELL G. WEATHERLY, and
ARTHUR M. PESLAK, *Administrative Patent Judges*.

PESLAK, *Administrative Patent Judge*.

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

I. INTRODUCTION

Ravin Crossbows, LLC (“Petitioner”) filed a Petition requesting an *inter partes* review of claims 1–4 and 7–19 (“the Challenged Claims”) of U.S. Patent No. 8,683,989 B1 (Ex. 1001, “the ’989 patent”). Paper 2 (“Pet.”). MCP IP, LLC (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”). Thereafter, with our authorization, Petitioner filed a Preliminary Reply. Paper 7 (“Prelim. Reply”). Patent Owner filed a Preliminary Sur-reply. Paper 8 (“Prelim. Sur-reply”).

We have authority, acting on the designation of the Director, to determine whether to institute an *inter partes* review under 35 U.S.C. § 314(a). *See* 37 C.F.R. § 42.4(a) (2024) (“The Board institutes the trial on behalf of the Director.”). Under 35 U.S.C. § 314(a), an *inter partes* review may not be instituted unless the information presented in the Petition shows “there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.”

Considering the Petition, the Preliminary Response, the Preliminary Reply, and the Preliminary Sur-reply as well as all supporting evidence, we conclude that the information presented in the Petition establishes a reasonable likelihood that Petitioner would prevail in its challenge of at least one claim of the ’989 patent as unpatentable. Pursuant to 35 U.S.C. § 314, we hereby institute an *inter partes* review of all challenged claims of the ’989 patent on the ground stated in the Petition.

A. Related Matters

Petitioner states “[t]he ’989 Patent is presently the subject of a patent infringement lawsuit filed against Petitioner in the United States District Court for the Western District of Wisconsin, *MCP IP, LLC v. Ravin*

Crossbows, LLC, Case No. 3:23-cv-00142-JDP (WDWI).” Pet. 98.

Patent Owner also states “[t]he ’989 Patent was the subject of the following prior actions, now complete: *MCP IP, LLC v. .30-06 Outdoors et al.*, 2-21-cv-00581 (SDOH), filed February 9, 2021; *MCP IP, LLC v Bowtech, Inc.*, 6-18-cv-01087 (DOR), filed June 21, 2018; and *MCP IP, LLC v. Bowtech, Inc.*, 6-17-cv-01896 (DOR), filed November 27, 2017.”

Paper 5, 1.

B. Real Parties-in-Interest

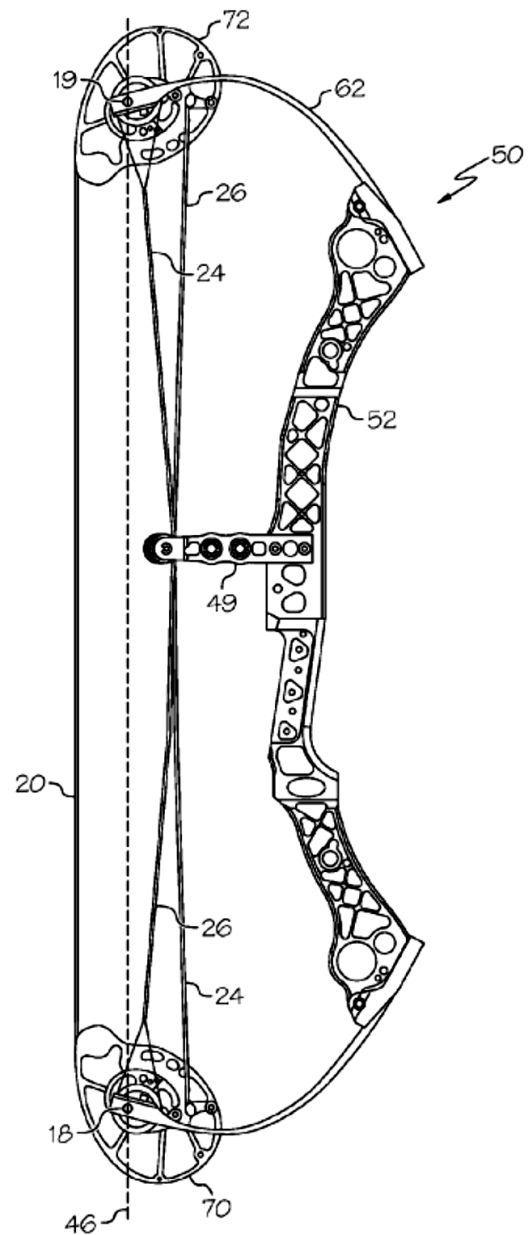
Petitioner identifies itself as the sole real party-in-interest. Pet. 98.
Patent Owner identifies itself as the sole real party-in-interest. Paper 5, 1.

C. Summary of the ’989 Patent (Ex. 1001)

The ’989 patent is titled “Archery Bow Cam.” Ex. 1001, code (54). The inventor named on the ’989 Patent is Mathew A. McPherson. *Id.* at code (75). The ’989 Patent’s application, No. 12/895,610, was filed September 30, 2010. *Id.* at codes (21), (22). The ’989 patent also identifies a related provisional application, No. 61/247,473, filed Sept. 30, 2009. *Id.* at code (60).

The ’989 patent “relates generally to archery bows and more specifically to a cam configuration suitable for use in bows.” *Id.* 1:12–14. The Specification states that “variable aspects of [a compound] bow, such as draw weight and draw length,” are “known in the art” but “[t]here remains a need for novel bow and cam designs that provide for greater adjustability . . . than prior art designs,” i.e., that “allow for a greater range of draw weights and draw lengths.” *Id.* at 1:23–28.

Figure 7, reproduced at right, “shows an embodiment of a compound archery bow.” Figure 7 illustrates bow 50 comprising riser 52, first and second limbs 60,¹ 62 supporting first and second rotatable members 70, 72 on first and second axles 18, 19, a drawstring 20, a first power cable 24, and a second power cable 26 extending between first and second rotatable members. *Id.* at 3:26–42. Each of the first and second rotatable members 70 and 72 comprises a cam² and is configured as a “mirror image” of the other. *Id.* 3:32–33, 3:42–45, 4:64–66, Fig. 7. The drawstring 20 extends between the cams 70, 72. *Ex.* 1001, 3:61–64. Pulling on the drawstring 20 will cause (not shown) inward flexing of the limbs 60, 62 and respective rotating of the cams 70, 72 (as described, below, for Figures 1 and 2). *Id.* at 3:51–54. In Figure 7, bow 50 is shown in its “brace condition,” i.e., “at-rest condition.” *Ex.* 1001, 3:50–51. When the drawstring 20 is completely pulled, the bow 50 has reached its “fully-drawn condition.”



¹ Bottom “limb 60” is described as-such but not labeled in Figure 7.

² The Specification of the ’989 patent uses the term “cam,” described in connection with Figures 1 and 2, interchangeably with “rotatable member” described in connection with Figure 7. *See e.g.*, *Ex.* 1001, 4:64–5:1, 5:8–10, Figs. 1, 2, 7.

Id. at 3:54–55. The force required to hold drawstring 20 in the fully-drawn condition is lessened (as compared to the force required to pull the drawstring 20 toward the fully-drawn condition) by the “compounding configuration of the cam(s) and power cable(s).” *Id.* at 3:54–57.

Figures 1 and 2, are reproduced at right.

Figure 1 is “an embodiment of a cam suitable for use in a bow . . . in a brace position.” Ex. 1001, 2:63–64. Figure 2 is “the cam of FIG. 1 in a drawn orientation.” Ex. 1001, 2:65. The cam 10 shown in Figures 1 and 2 correlates to the first rotatable member 70 of Figure 7. Ex. 1001, 3:58–61. While the bow 50 is in the braced condition (Figure 1), the axle 18 of cam 10 defines an axle plane 46 (along the axle 18 and orthogonal to the cam 10) separating each cam 10 into a first part 47 and second part 48. Ex. 1001, 3:30–31, 4:53–55. The first part 47 includes a capstan 30 and terminal 32. *Id.* 4:55–56. The second part includes the exit location 22 of the drawstring 20. *Id.* at 4:56–57. The shortest distance between the terminal 32 and the axle plane 46 is

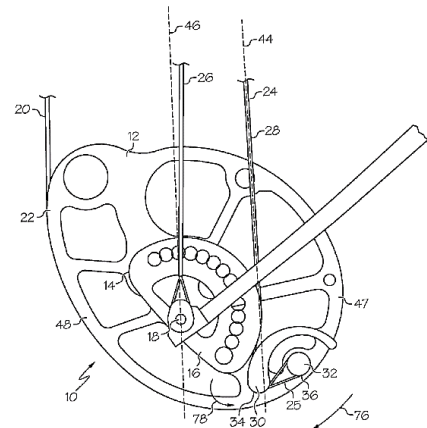


FIG. 1

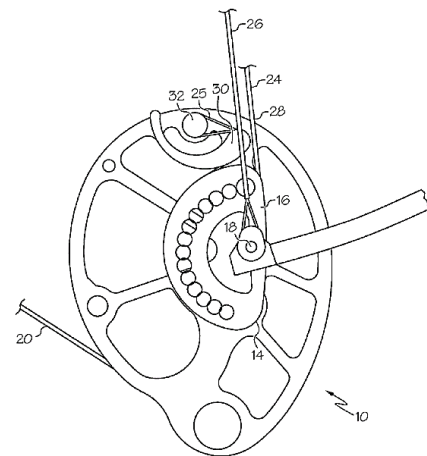


FIG. 2

greater than the shortest distance between the capstan 30 and the axle plane 46. *Id.* at 4:57–63.

As the drawstring 20 is pulled, i.e., as the bow 50 transitions from the braced condition (Figure 1) to the drawn condition (Figure 2), cam 10 rotates in the first rotational direction 76 (clockwise). Ex. 1001, 4:39–43. As seen in Figure 3 reproduced at right, cam 10 rotates approximately 225 degrees as the bow 50 moves from the braced condition to the drawn condition. *Id.* at 5:9–10. Figure 3 “is a combination of FIGS. 1 and 2, which shows how the cam rotates.” Ex. 1001, 2:66–67.

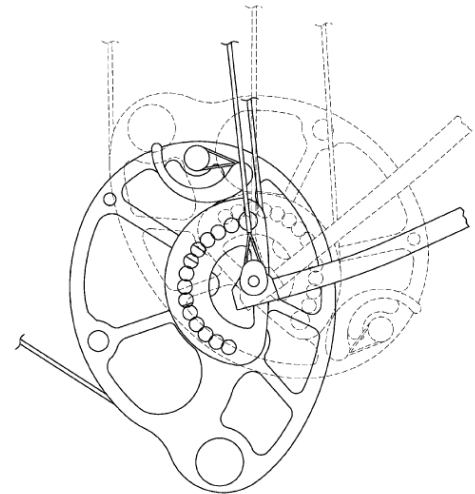


FIG. 3

The first power cable 24 has a first end anchored at the axle 19 of the second rotatable member 70 (i.e., at the top of limb 62 as shown in Figure 7) and a second end (terminal portion 36) anchored at the terminal 32 of the bottom cam 10 (i.e., at the bottom of limb 60 as shown in Figures 1–2). Ex. 1001, 3:33–37, 4:25–26. First power cable 24 has an elongate straight portion 28 defining a cable plane 44. *Id.* at 4:23–24, 4:46–47, Fig. 1. Although not explicitly described in the Specification of the '989 patent, based on Figure 7, first second power cable 24 is formed with a loop-like configuration on the first end. *Id.* at Fig. 7. The loop-like configuration engages a generally circular structure around axle 19. *Id.* at Figs. 1, 2, 7.

First power cable 24 contacts cam track 14 of adjustment module 16 in dependence upon the condition of the bow 50 (braced or drawn) as shown by Figures 1 and 2. Ex. 1001, 4:21–28, 4:39–41, 5:10–14. Generally (regardless of whether the bow 50 is braced or drawn), first power cable 24

contacts the cam track 14 of the adjustment module 16 until reaching the near-abutting portions of the adjustment module 16 and capstan 30 .

Capstan portion 34 of first power cable 24 wraps around the capstan 30, and extends to the terminal post 32. *Id.* at 4:21–45.

While the bow 50 is in the braced condition (Figure 1), first power cable 24 spans along a portion of adjustment module 16 and in a first direction toward capstan 30, , and then wraps around capstan 30 to extend to the terminal post 32 along another direction opposite of the first direction. Ex. 1001, 4:33–45. While the bow 50 is drawn, the first power cable 24 wraps almost around the adjustment module 16 and then wraps around the capstan 30 to extend to the terminal post 32 along another direction opposite of the second direction. *Id.* at 5:10–14. Thus, the first power cable 24 “wraps around the capstan 30 and extends toward the terminal post 32 in a . . . rotational direction 78 . . . that is opposite” the rotational direction 76 of the cam 10 while the bow 50 is being drawn. *Id.* at 4:39–45.

The '989 patent asserts the following advantages of this wrapping:

As shown in FIG. 2, the capstan 30 comes close to contacting the power cable 24, resulting in a portion [of] the power cable 24 almost contacting itself. Such contact is often a limiting factor in cam design, which limits the amount of rotation that can be achieved. Having the cable 24 wrap around the capstan 30 and extend in a direction opposite of cam rotation provides for some added draw capability. From FIG. 2, it is clear that if the power cable 24 wrapped in the same direction as cam rotation, and the terminal post 32 were located on the other side of the capstan 30, rotation capability would be substantially diminished.

In some embodiments, the use of a capstan 30 is beneficial because the location of the power cable 24 as it wraps about the capstan 30 is effectively fixed. In various cam designs where a

capstan 30 is not used, the power cable 24 often extends directly to the terminal post 32, allowing the power cable to rotate about the terminal post 32. Thus, the capstan 30 can be used to secure the power cable 24 such that it does not rotate about the terminal post 32. Also, a power cable 24 often splits to form a loop 25 at the terminal post 32. When an arrow is fired, high forces and vibrations are typically present in the cable 24. The capstan 30 causes reaction forces to be applied to portions of the cable 24 having a full cross-sectional area, whereas if the capstan 30 were omitted, reaction forces could be applied to the smaller cross-sectional area loop 25 portion.

Ex. 1001, 5:15–39.

D. Illustrative Claim

Claim 1 is reproduced below with Petitioner's annotations³:

1. (pre) An archery bow having a brace condition and a drawn condition, the archery bow comprising:

(a) a riser;

a first limb and a second limb supported by the riser;

(b)(i) a first rotatable member supported by the first limb on a first axle, a second rotatable member supported by the second limb on a second axle, (b)(ii) the first rotatable member comprising a drawstring track, (b)(iii) a cam track, (b)(iv) a capstan and a terminal, (b)(v) wherein said drawstring track is oriented in a first cam plane and said cam track is oriented in a second cam plane offset from said first cam plane;

(c) a drawstring extending between the first rotatable member and the second rotatable member;

(d)(i) a power cable attached to said terminal and extending toward the second limb, (d)(ii) said power cable comprising an elongate straight portion located near said first rotatable member, a capstan portion in contact with said capstan and a terminal portion in contact with said terminal;

³ We use Petitioner's annotations herein for ease of reference.

(e) wherein, in the brace condition, the power cable wraps around the capstan in a first rotational direction as the power cable is traversed from the elongate straight portion to the terminal portion; and

(f) when the bow is drawn from the brace condition, the first rotatable member rotates in a second rotational direction that is opposite the first rotational direction and

(g) wherein, in the brace condition, the elongate straight portion defines a plane, wherein said first axle and said terminal are located on opposite sides of said plane.

Ex. 1001, 6:48–7:8.

E. Asserted Grounds of Unpatentability

Petitioner, supported by the declaration of Joshua Lange, P.E. (Ex. 1003), asserts one ground of unpatentability (Pet. 4–5)⁴:

Claims Challenged	35 U.S.C. §	References/Basis
1–4, 7–9	§ 103	Darlington, ⁵ Islas ⁶

II. ANALYSIS

A. Overview

A claim is unpatentable under § 103(a) 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

⁴ We apply the pre-AIA version of 35 U.S.C. § 103 because the claims at issue have an effective filing date prior to March 16, 2013, the effective date of the Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”). *See* Ex. 1001, code (22).

⁵ Darlington, U.S. Pat. 8,205,607 B1, issued June 26, 2012 (Ex. 1004, “Darlington”).

⁶ Islas, U.S. Pat. Appl. Pub. 2008/0135032 A1, published June 12, 2008 (Ex. 1005, “Islas”).

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) when in evidence, objective indicia of non-obviousness (i.e., secondary considerations).⁷ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

The Supreme Court explained in *KSR International Co. v. Teleflex Inc.* that

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

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

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

⁷ No evidence of secondary considerations has been presented at this stage of the proceeding.

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

B. Level of Ordinary Skill in the Art

In order to determine whether an invention would have been obvious at the time the application was filed, we consider the level of ordinary skill in the pertinent art at critical time. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). The resolution of this question is important because it allows us to “maintain[] objectivity in the obviousness inquiry.” *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991). In assessing the level of ordinary skill in the art, various factors may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (quotation omitted). Generally, it is easier to establish obviousness under a higher level of ordinary skill in the art. *Innovation Toys, LLC v. MGA Entm’t, Inc.*, 637 F.3d 1314, 1323 (Fed. Cir. 2011) (“A less sophisticated level of skill generally favors a determination of nonobviousness . . . while a higher level of skill favors the reverse.”).

Petitioner asserts a person having ordinary skill in the art on the priority date of the ’989 patent:

would have had (i) a Bachelor of Science degree in mechanical engineering, materials science, or a similar technical field; (ii) a working knowledge of and/or experience with projectile weapon (e.g., archery bow) operation and performance; and (iii) two to four years of experience with designing and manufacturing of consumer products.

Pet. 3–4 (citing Ex. 1003 at ¶¶ 25–28).

Patent Owner does not challenge Petitioner’s definition. *See generally* Prelim. Resp.

For the purposes of this Decision, we apply Petitioner’s uncontested definition because it appears consistent with the problems addressed in the ’989 patent and the prior art.

C. Claim Construction

In an *inter partes* review proceeding, a patent claim shall be 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). 37 C.F.R. § 42.100(b) (as amended Oct. 11, 2018). Our rule adopts the same claim construction standard used by Article III federal courts, which follow *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc), and its progeny. Under this standard, the words of a claim are generally given their “ordinary and customary meaning,” which is the meaning the term would have to a person of ordinary skill at the time of the invention. *See Phillips*, 415 F.3d at 1312–13. In construing claims in accordance with their ordinary and customary meaning, we take into account the specification and prosecution history. *Id.* at 1315–17.

Neither party proposes an express construction for any claim terms. Pet. 3; *see generally* Prelim. Resp. We agree that no claim terms require express construction for purposes of this Decision. The parties are free to

argue the construction of any claim term in subsequent briefing during trial, however, claim construction arguments should be presented in clearly delineated sections of subsequent briefing.

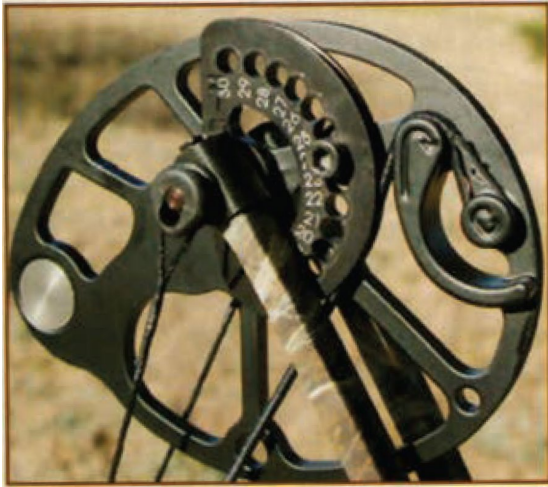
D. Prior Art Status of Darlington

Petitioner applies the date of filing of the provisional application referenced in the '989 patent of September 30, 2009 as the priority date for the challenged claims. Pet. 2. Petitioner contends that Darlington qualifies as prior art under 35 U.S.C. § 102(e) because it was filed June 30, 2009, and published June 26, 2012. *Id.* at 4 (citing Ex. 1004).

Patent Owner contends Darlington is not prior art because the inventor of the '989 patent “Mathew McPherson designed, built, and commercialized the invention [of] each and every Challenged Claim in 2008.” Prelim. Resp. 4–5 (citing Ex. 1004; Ex. 2006). Patent Owner also contends that, before the filing of the Petition, Petitioner “knew that MCP had reduced the technology of the '989 Patent to practice at least as early as the last quarter of 2008 . . . yet it failed to address such in the Petition.” *Id.* at 8 (citing Ex. 2009, 7–10).

In support of the alleged reduction to practice, Patent Owner submits declarations of Matthew McPherson (Ex. 2006), expert witness Charles F. Reinholtz, Ph.D. (Ex. 2007), and Jeffrey A. Ozanne, VP of Legal Operations of Mathews Archery, Inc. (Ex. 2008). Patent Owner also submits what it purports to be two magazine articles written by a Bill Krenz (“Krenz articles”) asserted as teaching the '989 patent’s embodiments of the invention: (1) “Inside Archery Bow Report – 2009 Mission Menace” (Ex. 2002); and (2) “Inside Archery Bow Report – Mathews McPherson Series” (Ex. 2003). The McPherson declaration and Reinholtz declaration

refer to two photographs excerpted from the articles (Ex. 2002, 2003);⁸ each reproduced below. Ex. 2002, 2; Ex. 2003, 1; *see also* Ex. 2006, 7, 10, 15, 17; Ex. 2007, 22, 24, 30–33, 35, 39–40, 45, 47–50, 53–55.



The image above depicts a cam alleged to be used on a bow called the Mission Menace. Ex. 2002, 2.



This image depicts a cam alleged to be used on a bow called the Mathews Monster. Ex. 2003, 1.

Patent Owner asserts that the two magazine articles, and the respective photographs of the cams show “work[ing]” examples (Prelim. Resp. 8) of: a “Menace bow . . . designed and built in 2008[,] . . . launched in October 2008” (Prelim. Resp. 9 (citing Ex. 2006 ¶ 9)) and “reviewed in the December 2008 issue of Inside Archery” (Prel. Resp. 8 (citing Ex. 2002)); and a “Monster bow . . . designed and built in 2008”

⁸ The Ozanne declaration attests that exhibits (Ex. 2002, 2003) are true and accurate copies of magazine articles in the archives of Mathews Archery, Inc. Ex. 2008 ¶¶ 3–4.

(Prelim. Resp. 12 (citing Ex. 2006 ¶ 16)) and “reviewed in the June 2009 issue [of *Inside Archery*].” (Prelim. Resp. 8–9 (citing Ex. 2003)).

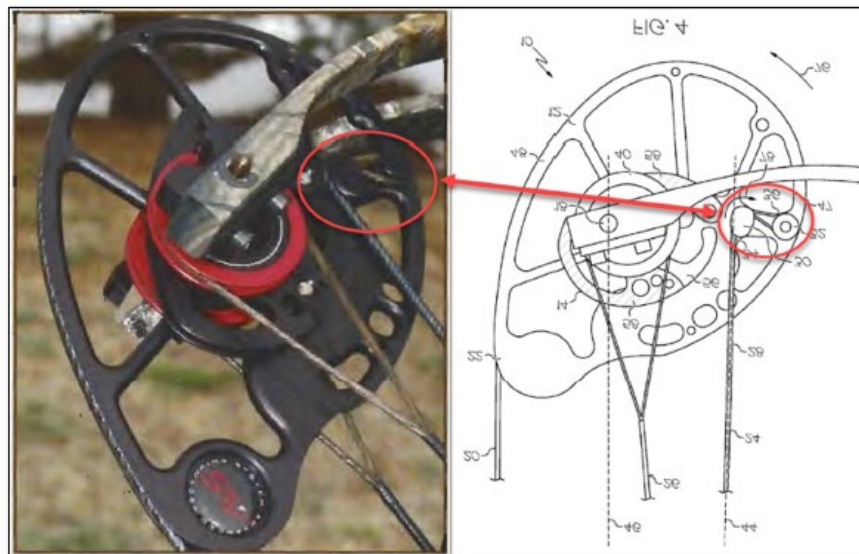
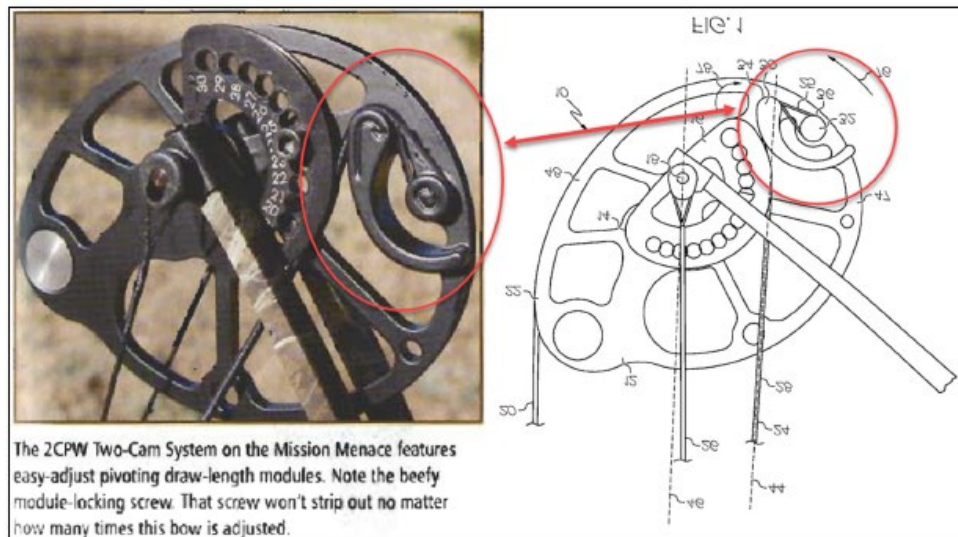
As to the Menace and Monster bows generally,⁹ Patent Owner contends:

Before June 30, 2009, Mr. McPherson designed and built the Mission Menace and Mathews McPherson Series Monster bows. EX2006, para. 8. The inventions embodied in the two bows were reduced to practice and worked for their intended purposes, as evidenced by the fact that both bows were commercially produced and were “tested for proper operation before being approved for production.” EX2006, para. 15, 23. Moreover, Mathews Archery was so certain that the bows worked that they sent both bows to Inside Archery magazine for review soon after each product was launched. EX2006, para. 9, 17. The Menace bow was reviewed in the December 2008 issue of Inside Archery and the Monster Bow was reviewed in the June 2009 issue. EX2002; EX2003. Together these two articles provide third-party evidence corroborating that the inventions, as recited in the Challenged Claims, were reduced to practice before Darlington’s priority date and that the inventions operated for their intended purposes. Among other things, the design freedom offered by the “reverse wrap” had enabled Mr. McPherson to design the Mission Menace bow to work over a wide range of draw lengths and the Mathews McPherson Series Monster bow to achieve a high arrow speed. EX2002; EX2003; EX2006, para. 7.

Prelim. Resp. 8–9.

Patent Owner also provides the following two side-by-side comparisons of the above photographs and the ’989 Patent’s drawings:

⁹ Patent Owner also presents photographs of the entire fully strung bows in the braced condition from the Krenz articles. *See, e.g.*, Prelim. Resp. 16, 36.



The top figure compares the Menace bow cam (Ex. 2002) on the left and the cam shown in Figures 1–2 of the '989 patent on the right and the bottom figure compares the Monster bow cam (Ex. 2003) on the left and the cam shown in Figures 4–5 of the '989 patent on the right. Prelim. Resp. 12, 14.

Petitioner responds that Patent Owner fails to establish that the '989 patent's inventor "constructed an embodiment or performed a process that met all of the limitations of the claim." Prelim. Reply 1 (quoting *In re Steed*, 802 F.3d 1311, 1318 (Fed. Cir. 2015) (emphasis

omitted)). Petitioner contends Patent Owner's evidence (Exs. 2002, 2003) fails because "the challenged claims require specific geometric relationships when a bow is in the 'drawn' or 'brace' conditions[] but the images provided by PO depict neither condition and therefore cannot serve as evidence of the claimed spatial orientations." *Id.* Petitioner further contends Patent Owner cannot "fill these substantive holes through the declaration provided by Mathew McPherson, the sole inventor and CEO of MCP, Inc.," because "[u]ncorroborated inventor testimony is strongly disfavored and should not form a basis for denial given its inherent bias and untrustworthiness." *Id.* at 1–2 (citing *Apator Miitors ApS v. Kamstrup A/S*, 887 F.3d 1293, 1295 (Fed. Cir. 2018)).

Petitioner also presents arguments directed to specific claim limitations. Prelim. Reply 2–5. As to limitation 1(d)(ii),¹⁰ Petitioner contends:

PO relies on an image purportedly from a magazine (Ex. 2002) to show the claimed "elongate straight portion" of the power cable extending toward a second limb and "located near said first rotatable member." Yet PO makes no attempt to show how this "straight portion" is located near a first rotatable member at all, whether it extends toward a second limb (no second limb is shown in the image), or where the claimed "capstan portion in

¹⁰ The argued limitation is particularly: "a power cable attached to said terminal and extending toward the second limb, said power cable comprising an elongate straight portion located near said first rotatable member, a capstan portion in contact with said capstan and a terminal portion in contact with said terminal." Prelim. Reply 2. The Reply identifies this limitation as "1(f)." Reply 2. The argued recitation, as designated by the Petition, is identified as limitation 1(d)(ii). Pet. 25. We understand the Preliminary Reply is following the same designation set forth in the Preliminary Response. Prelim. Resp. 17. We will, however, maintain consistency in identifying the limitations by using the Petition's designations.

contact with said capstan and a terminal portion in contact with said terminal” are found in this image.

Prelim. Reply 2–3 (citing Prelim. Resp. 17–18). As to limitations 1(e) and 1(f),¹¹ Petitioner contends:

Limitations [1(e) and 1(f)] require specific orientations of the power cable in the brace condition, and specific rotational directions of a first rotatable member relative to other physical elements in the cam when the bow is drawn from the brace condition. But images in Ex. 2002 show an unstrung bow that is not in a “brace condition” at all. And PO provides nothing to show how the cam and its elements will move when “drawn from the brace condition,” as required by Limitation (h).

Id. at 3. And, as to limitation 1(g),¹² Petitioner contends:

PO again relies on the same image of an unstrung cam from Ex. 2002 to teach this limitation.

... Limitation [1(g)] requires a specific orientation between a “first axle,” an “elongate straight portion,” and a

¹¹ The argued limitations are particularly: “where, in the brace condition, the power cable wraps around the capstan in a first rotational direction as the power cable is traversed from the elongate straight portion to the terminal portion” and “when the bow is drawn from the brace condition, the first rotatable member rotates in a second rotational direction that is opposite the first rotational direction.” Prelim. Reply 3. The Reply and Preliminary Response designate these limitations as “1(g)” and “1(h).” *Id.* at 3; Prelim. Resp. 18. The argued recitation, as identified by the Petition, is rather limitations 1(e) and 1(f). Pet. 28, 30. We use the Petition’s designations.

¹² The argued limitation is particularly: “wherein, in the brace condition, the elongate straight portion defines a plane, wherein said first axle and said terminal are located on opposite sides of said plane.” Preliminary Reply 4. The Preliminary Reply and Preliminary Response designate the limitation as “1(i).” Reply 4; Prelim. Resp. 19. The argued recitation, as identified by the Petition, is rather limitation 1(g). Pet. 44. We use the Petition’s designations.

“terminal” when the cam is in the brace condition. But PO provides no evidence to show the cam is in the brace condition, and the image itself confirms that no drawstring is present [(i.e., unstrung)], making a brace condition impossible. Thus, any purported evidence about the orientations of specific elements when not in the brace condition cannot meet PO’s burden to show the orientation of these elements in the claimed “brace condition.”

Prelim. Reply 4 (citing Prelim. Resp. 19–20) (image omitted).

Patent Owner responds that both Exhibit 2002 and Exhibit 2003 “include a photograph of a full, strung bow in the brace condition” and the “photographs are reproduced multiple times in the” Preliminary Response. Prelim. Sur-reply 2 (citing Prelim. Resp. 16, 23, 28, 36, 42; Ex. 2002, 2; Ex. 2003, 2). Patent Owner argues that “Petitioner’s assertion that the cam is unstrung in a close-up photograph from the Menace article is baseless.” *Id.* (citing Prelim. Reply 4; Ex. 2002, 2). Patent Owner further argues that “[t]he reviewer describes shooting the bow, which requires it to be strung,” and “[t]he photograph reproduced by Petitioner shows the power cables under tension, and the bow’s limbs flexed (the power cables would be slack and limbs unflexed if unstrung).” *Id.* at 3. According to Patent Owner, the cam in the photograph is “shown in the same orientation as it is in the full, strung bow photograph – which is the brace condition.” *Id.*

In response to Petitioner’s argument that it does not “show how the cam and its elements will move when ‘drawn from the brace condition,’” (Prelim. Reply 3, 5), Patent Owner argues that Petitioner “ignores Mr. McPherson’s explanation” and “Dr. Reinholtz’s testimony on the operation of the cam and its elements.” Prelim. Sur-reply 3–4 (citing Ex. 2006 ¶¶ 6, 14, 22; Ex. 2007 ¶¶ 43, 45–46, 56–57, 65).

Analysis

The Federal Circuit instructs that: “[t]o demonstrate an actual reduction to practice, the applicant must have: (1) constructed an embodiment or performed a process that met all the limitations of the claim and (2) determined that the invention would work for its intended purpose.” *Steed*, 802 F.3d at 1318. “That is, to reduce any particular claim to practice, the applicant must have constructed an operational embodiment within the scope of that claim.” *Nintendo of America Inc. v. iLife Technologies, Inc.*, 717 Fed. Appx. 996 (Fed. Cir. 2017) (addressing *Steed*’s above, two-prong standard). The Board may find an actual reduction to practice based on, for example, “testimony of the inventors, corroborating witnesses, and corroborating documentary evidence” (*id.* at 1002) if “[t]his evidence, taken together, is sufficient for a reasonable mind to conclude that the prototype created by the inventors . . . was within the scope of claims . . . and would work for its intended purpose” (*id.* at 1003). But if “[t]he prototype has not been shown to meet all the limitations of the[] claims, . . . the record thus lacks evidence sufficient to support the . . . conclusion [of an actual reduction to practice].” *Id.* at 1004 (citing *Steed*, 802 F.3d at 1318).

“[A]n inventor’s testimony alone is insufficient to establish an earlier reduction to practice. *Medichem[, S.A. v. Rolabo, S.L.]*, 437 F.3d [1157,] 1169–71.” “In the final analysis, each corroboration case must be decided on its own facts with a view to deciding whether the evidence as a whole is persuasive.” *Cooper v. Goldfarb*, 154 F.3d 1321, 1331 (Fed. Cir. 1998) (quoting *Berges v. Gottstein*, 618 F.2d 771, 776 (C.C.P.A. 1980)).

In order to antedate Darlington, Patent Owner primarily relies on Mr. McPherson's testimony (Ex. 2006) and the Krenz articles to corroborate his testimony (Ex. 2002, 2003). *See* Prelim. Resp. 8–14.

As to Dr. Reinholtz, he does not testify that he has personal contemporaneous knowledge of the activities of Mr. McPherson in or around 2008 or the bows that are pictured in Exhibits 2002 and 2003. *See generally* Ex. 2007. Rather, Dr. Reinholtz testifies “that the 2009 model year Mission Menace bow and the 2009 Mathews McPherson Series Monster bow embodied the claim limitations of the '989 patent” based on his comparison of the disclosure in the Krenz articles “to the claims of the '989 patent . . . from the perspective of a” person of ordinary skill in the art. *Id.* ¶ 32. Due to his lack of personal contemporaneous knowledge, his testimony cannot corroborate Mr. McPherson's testimony concerning reduction to practice and we give it no weight in that regard.¹³

We turn first to the Krenz articles. Mr. Ozanne¹⁴ holds the position of VP of Legal Operations at Mathews Archery, Inc. (“Mathew's”) ¹⁵ Ex. 2008 ¶

¹³ Dr. Reinholtz's testimony may be helpful in an analysis of whether the bows pictured in the Krenz articles incorporate the claim limitations at issue but we don't reach that question at this time.

¹⁴ Mr. Ozanne testifies that he has been employed by Mathews Archery, Inc. for nearly 13 years. Ex. 2008 ¶ 1. From this, it appears that he was not employed at Mathews Archery, Inc. during the time the Krenz articles were allegedly published or during Mr. McPherson's work designing the Mission Menace bow or the Mathews Monster bow.

¹⁵ Patent Owner does not designate Mathews Archery, Inc. as a real party in interest. Paper 5, 1. Mr. McPherson testifies that he is the “owner and CEO of Mathews Archery, Inc. and a member of [Patent Owner].” Ex. 2006 ¶ 2. We note that Patent Owner has a continuing duty to name all real parties-in-interest. 37 C.F.R. § 42.8(a)(2), (b)(1).

1. He testifies that he is “familiar with Mathew’s archives repository of materials relating to bows we have sold over the years” and as part of Mathews’ regular business activities it “archives and maintains copies of publications about our products” including “magazine articles discussing our products are collected contemporaneously with their release and deposited in the archive¹⁶ for later reference.” *Id.* ¶ 3. He testifies that Exhibit 2002 and Exhibit 2003 are true and correct copies of articles “from the December 2008 issue of *Inside Archery* ‘and a *Bow Report* article titled ‘2009 Mathews McPherson Series Monster’ from the June 2009 issue of *Inside Archery*” that were obtained from Mathews’s archive. *Id.* ¶ 4. We note that Patent Owner provides only the articles not the entirety of the magazine in which the articles allegedly appeared or any page from the magazines stating the publication information or copyright date.

Mr. McPherson testifies that “[t]he Mission Menace bow was designed in 2008 and launched in October 2008” and one of the bows was shipped to Bill Krenz for testing. Ex. 2006 ¶ 9. He also testifies that “[t]he Mission Menace was produced by my company, Mission Archery, which was an affiliate of, and now merged with, Mathews Archery, Inc.”¹⁷ *Id.* ¶ 8. Mr. McPherson also testifies that he reviewed Exhibit 2002 and “confirmed

¹⁶ We note that it is unclear how Mr. Ozane could have personal knowledge of these facts because he has “been employed by Mathews for nearly 13 years” (i.e., since about 2011 or 2012, years after the Krenz articles were allegedly published and deposited in Mathews’ archive). *Id.* ¶ 1.

¹⁷ We note that the record does not fully clarify the relationship among Mission Archery, Mathews Archery, Inc., Mr. McPherson, and Patent Owner (MCP IP, LLC).

that the bow described and pictured in the article is the 2009 Mission Menace bow.” *Id.* ¶ 10.

Mr. McPherson next testifies that “[t]he Mathews Monster bow was designed and built as early as November 2008”, was first sold “in early 2009,” and one of the bows was shipped by Mathews Archery, Inc. to Bill Krenz “soon after the launch” for testing. Ex. 2006 ¶¶ 16–17.

Mr. McPherson also testifies that he reviewed Exhibit 2003 and “confirmed that the bow described and pictured in the article is the Mathews Monster bow.” *Id.* ¶ 18.

Mr. McPherson testifies that he designed the Mission Menace bow and the Mathews Monster bow prior to filing the provisional application. Ex. 2006 ¶ 8. He also testifies that Figures 1–3 of the ’989 patent were based on the CAD drawings for the Mission Menace bow and Figures 4–6 were based on the CAD drawings for the Monster bow. *Id.* Patent Owner does not submit the referenced CAD drawings or other internal documents concerning the research, design, or development of either bow.

Patent Owner has not produced any contemporaneous manufacturing, or shipping documents for either the Mission Menace bow or the Matthews Monster bow allegedly shipped to Mr. Krenz nor does Patent Owner submit serial numbers or other indicia of identification for the bows. Additionally, Patent Owner presents no documents identifying the bows shown in the Krenz articles or when the bows were shipped or invoices for any other bows allegedly shipped prior to the critical date.

Patent Owner does not provide any testimony from a corroborating witness about the alleged receipt and testing of the bows. Consequently, we are left with only Mr. McPherson’s testimony that the bows shown in the

Krenz articles are, in fact, bows shipped by Mathews Archery, Inc. in 2008 or 2009.

For the foregoing reasons, the evidence before us does not provide sufficient independent corroboration of Mr. McPherson's testimony that the bows shown in the Krenz articles were in fact shipped by Mathews Archery, Inc. to Mr. Krenz in 2008 and/or early 2009. Although a comparison of the cams shown in Exhibits 2002 and 2003 to the drawings of the '989 patent appears to support Patent Owner's argument that the bows embody the claim limitations, the lack of independent corroboration for Mr. McPherson's testimony weighs in favor of us granting Petitioner's request for an opportunity to challenge Patent Owner's evidence. Likewise, Patent Owner is free to present additional corroborating evidence during the trial.¹⁸

E. Summary of Darlington (Ex. 1004)

Darlington is titled "Compound Archery Bow." Ex. 1004, code (54). The disclosure "relates to compound archery bows having pulleys at the ends of the bow limbs to control the force/draw characteristics of the bow, and more particularly to compound archery bows having a draw length module removably mounted on at least one of the pulleys for adjusting bow draw length." *Id.* at 1:3–8. "A general object . . . is to provide a compound archery bow . . . that achieves enhanced power and arrow speed . . . , and/or reduces or eliminates timing issues between cams on dual-cam bows, and/or

¹⁸ Patent Owner is cautioned that any arguments not raised in the Patent Owner Response may be deemed waived. *See In re NuVasive, Inc.*, 842 F.3d 1376, 1379–82 (Fed. Cir. 2016) (holding that a patent owner waived an argument addressed in a preliminary response by not raising the same argument in the patent owner response).

in which the draw length module can be replaced for adjusting draw length without disassembling the power cam or the bow.” *Id.* at 1:32–38.

Darlington’s Figure 1A is reproduced below:

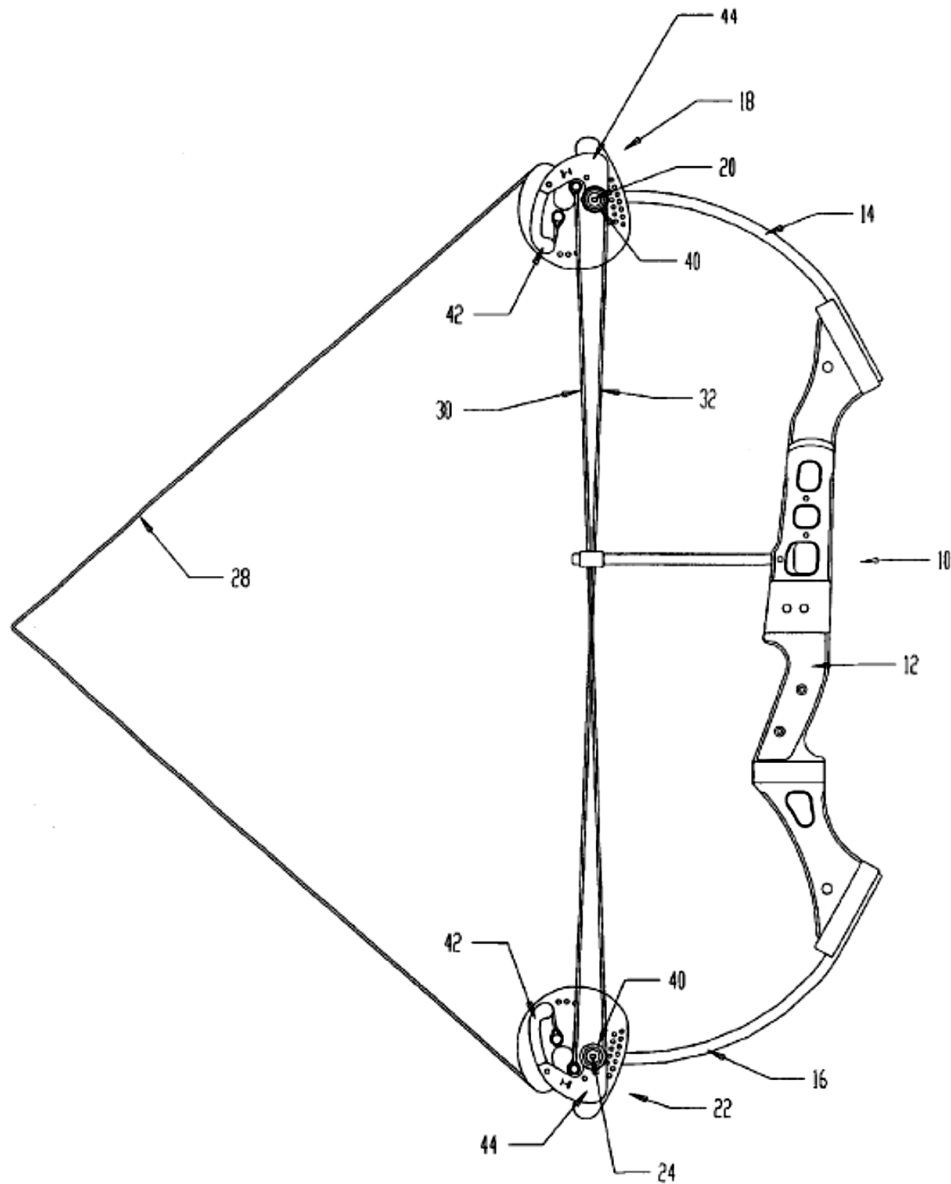
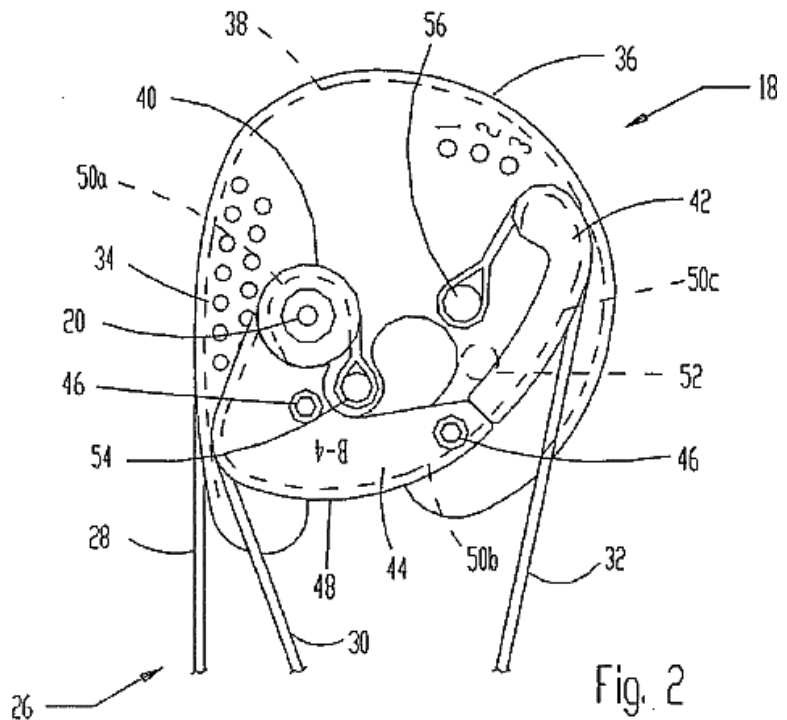


Figure 1A “is an elevational view of the bow . . . with the bowstring cable fully drawn.” Ex. 1004, 2:13–14. Darlington’s bow 10 comprises “[a]n upper pulley 18 [] mounted on limb 14 for rotation around an axle 20, and a lower pulley 22 [] mounted on limb 16 for rotation around an axle 24.

Pulleys 18, 22 are similar in function and preferably are near mirror images of each other.” *Id.* at 2:39–43.

The top portion of Figure 2 is reproduced at right. Figure 2 is “a fragmentary elevational view on an enlarged scale of the pulleys in the bow of FIG. 1.” Ex. 1004, 2:15–16. Upper pulley 18 includes a flat portion 34 (i.e., face) and a peripheral edge 38 having a bowstring groove 38. *Id.* at 2:50–52. Mounted on the flat



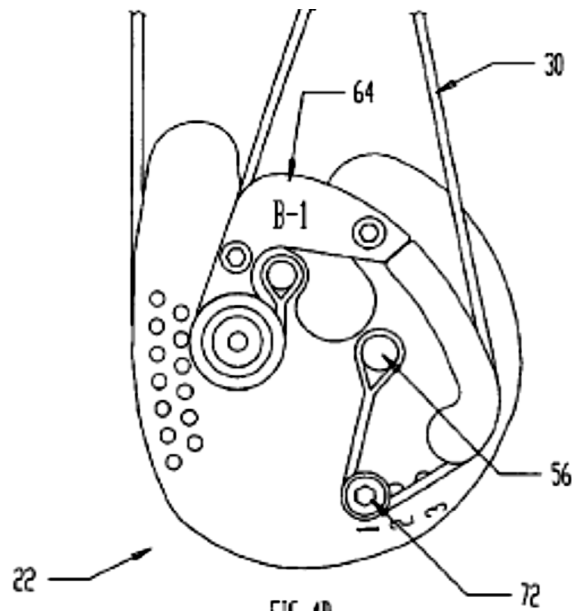
portion 34 are a hub 40, removable draw-length module 44 (by screws 46), secured section 42, and respective anchors 54, 56 of the power cables 30, 32. *Id.* at 2:52–55, 3:2–8. The draw-length module 44 has ends abutting the hub 40 and secured section 42 such that respective cable grooves 50a, b, c of the hub 40, draw-length module 44, and secured section 42 form a substantially continuous cable groove 50. *Id.* at 2:57–65.

While the bow 10 is braced (as shown in Figure 2), the bowstring cable 28 extends almost fully along the peripheral edge 36 (in the bowstring groove 38) to wrap around cam 18 and anchor an end to bowstring anchor 52. Ex. 1004, 2:66–3:2. First power cable 30 extends from its anchor 54, wraps around hub 40 (in groove section 50a), arcs along the removable draw-length module 44 (in groove section 50b), and exits straightly toward

the lower pulley 22 (and particularly to the secured section 42 thereof). *Id.* at 3:2–6. Second power cable 32 extends from its anchor 56, wraps around the secured section 42 (in groove section 50c), and exits straightly toward the lower pulley 22 (and particularly to the draw-length module 44 thereof). *Id.* at 3:6–8. As illustrated, the above anchoring and configuration of the power cables 30, 32 are repeated for the lower pulley 22.

As the bow 10 is drawn (to the configuration of Figure 1A), bowstring cable 28 withdraws from the bowstring groove 38 of the pulleys 18, 22, the upper pulley 18 rotates counterclockwise about its axle 20, and lower pulley 22 rotates clockwise about its axle 24. Ex. 1004, 3:14–19. The first power cable 30 is “let out” of the upper pulley 18 (particularly out of the removable draw-length module 44 and then the hub 40) while being “taken up” by the lower pulley 22 (particularly by the secured section 42, then removable draw length module 44, and then the hub 40). *Id.* at 3:20–23. The second power cable 32 is, likewise, “let out” of the lower pulley 22 and “taken up” by the upper pulley 18. *Id.* at 3:23–26. Thus, rotation of pulleys 18, 22 results in the first power cable 32 of the pulley cam 18 occupying cable-groove portions 50a, 50b, 50c previously occupied by the second power cable of the pulley cam 22, and vice-versa. *Id.* at 3:26–29.

Figure 4D is reproduced at right.
Figure 4D is an “elevational view[] of the lower pulley [22] in FIG. 2.”
Ex. 1004, 2:19–20. The cam 22 of Figure 4D comprises a movable intermediate post 72 (which, as shown, the power cable 30 wraps around after exiting the unlabeled secured section 42 and prior to reaching the anchor 56) to adjust the “effective length” of power cable 30.



Id. at 3:65–4:4. “This allows the pre-stress in the bow limbs and the distance from the handle grip to the bowstring to remain constant with the use of different draw modules.” *Id.* 4:4–6.

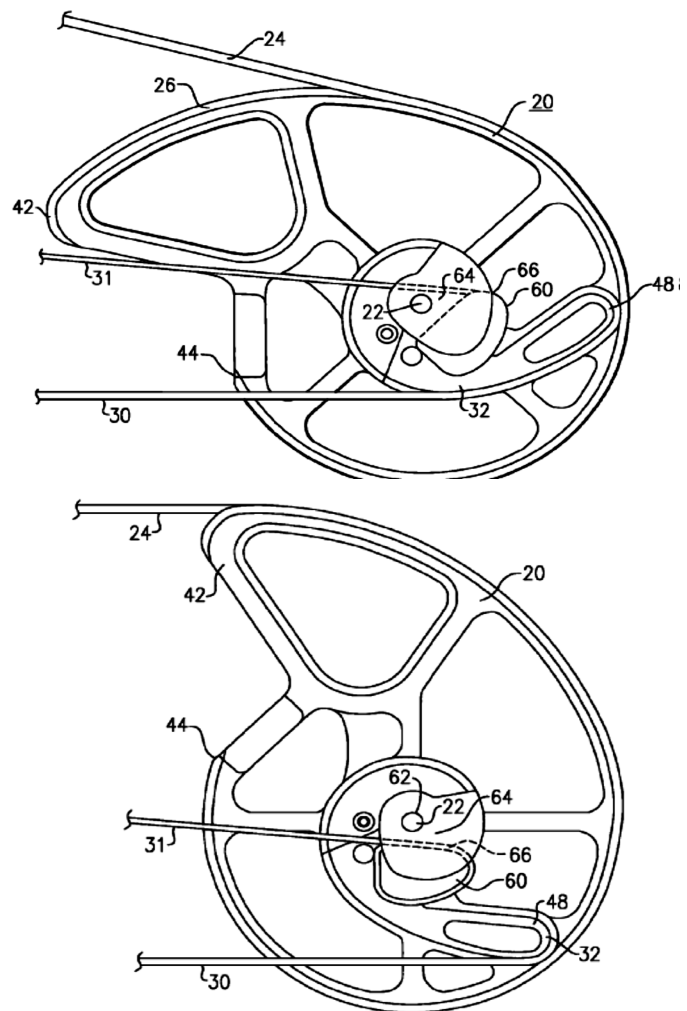
F. Summary of Islas (Ex. 1005)

Islas is titled “Bowstring Cam for Compound Bow.” Ex. 1005, code (54). The disclosure “is directed . . . to compound bows of the type employing cams and control cables to achieve a programmed draw weight, and . . . improvements to such compound bows . . . which permit the archer to select the bow’s draw characteristic.” *Id.* ¶ 2.

Islas's Figures 1 and 3 are reproduced at right (respectively top and bottom). Figures 1 and 3 respectively illustrate "a side view of the cam assembly . . . with the bowstring drawn back" and "a side view of the cam assembly, with the bowstring released, i.e., not drawn." Ex. 1005 ¶¶ 18, 20.

The cam 20 includes first and second power cams 32, 60 respectively receiving first and second power cables 30, 31. Ex. 1005 ¶¶ 30–31. First and second power cables 30, 31 rotate the respective cams 20 when the drawn bowstring 24 is released (i.e., as the bow returns to the braced condition of Figure 3). *Id.* ¶ 31. Islas asserts cam 20 has the following advantages during such rotation:

As shown . . . , the improved version of the bowstring cam assembly has first power cams 32 and second power cams 60 disposed on each side of the bowstring cam member 20. The second cam member 60 is disposed outside, or below, the axis 22 of the pivot pin 62 or axle of the bowstring cam assembly. The pivot pin or axle 62 is affixed on each side to a crank portion 64 that defines an offset from the pivot pin 62 to the inside portion of the cam 60. In other words, there is a void behind the crank portion 64 where the second power cable 31 can cross the axis 22 during the rotary travel of the bowstring cam assembly.



Note that at the end of travel after the bowstring is released, both of the power cables 30 and 31 are pulling together to turn the cam member 20. In the prior art, the two power cables, i.e., the two halves of the power cable, always pull against one another.

The power cable 31 contacts the second power cam member 60 at the fulcrum point 66. Initially, i.e., before the bowstring 24 is drawn back, the fulcrum point is below or to the outside of the axis 22 of the pivot pin 62. As the bowstring is drawn back, the cam 60 rotates and allows the fulcrum point 66 to move to the other or superior side above the axis of the pivot pin 62 Th[is] effects the let-off, i.e., decrease in draw weight as the bowstring 24 is drawn fully back. As rotation increases, the mechanical advantage increases as the fulcrum point 66 moves out radially from the axis 22, opposite to the position of the corresponding fulcrum point of the power cable 30 on the first power cam member 32.

Id. ¶¶ 30–32.

G. Alleged Obviousness

1. Claim 1

Petitioner provides a limitation-by-limitation analysis of claim 1 and maps each claim limitation to either Darlington alone or the combination of Darlington and Islas. Pet. 7–47. Petitioner also argues that a person of ordinary skill in the art would have been motivated to combine the references with a reasonable expectation of success. *Id.* at 40–44.

Patent Owner contends that the combination of Darlington and Islas does not suggest limitations 1(e), 1(f), and 1(g) which collectively Patent Owner characterizes as “reverse wrap.” Prelim. Resp. 2–4 (describing “reverse wrap”), 58–66 (asserting Darlington and Islas lack the “reverse wrap”). Patent Owner also contends that the combination of Darlington and Islas “is nothing more than an improper hindsight reconstruction of the

'989 Patent's FIG. 4." Prelim. Resp. 66–67 (citing Pet., 30 (Petitioner's annotated image of the "modified Darlington pulley"); Ex. 1001, FIG. 4).

With this background, we now address the parties' respective contentions.

- i. Preamble 1(pre): "An archery bow having a brace condition and a drawn condition"*

Petitioner maps the recited archery bow having a brace condition and drawn condition respectively to Darlington's bow 10 as braced in Figure 1 and as drawn in Figure 1A. Pet. 7–8 (citing Ex. 1004, Abstract, 3:14–19, Figs. 1, 1A).

Patent Owner does not address the preamble in the Preliminary Response. *See* Prelim. Resp.

We reviewed the evidence cited by Petitioner and find that Darlington sufficiently discloses the subject matter of the preamble. Because we find that Darlington sufficiently discloses the subject matter of the preamble, we need not address whether the preamble is limiting.

- ii. Limitation 1(a): "a riser" and "a first limb and second limb supported by the riser"*

Petitioner maps the recited riser, first limb, and second limb respectively to Darlington's handle/risers 12, upper limb 14, and lower limb 16. Pet. 8–9 (citing Ex. 1004, Abstract, 1:42–55, 2:32–39, Fig. 1).

Patent Owner does not address limitation 1(a) in the Preliminary Response. *See generally* Prelim. Resp.

We reviewed the evidence cited by Petitioner and find that Darlington sufficiently discloses the subject matter of this limitation.

- iii. *Limitation 1(b)(i): “a first rotatable member supported by the first limb on a first axle” and “a second rotatable member supported by the second limb on a second axle”*

Petitioner maps the recited first rotatable member, second rotatable member, first axle, and second axle respectively to Darlington’s lower pulley 22, upper pulley 18, and the respective axles 24, 20. Pet. 9–11 (citing Ex. 1004, 1:42–47, 2:39–43, Figs. 1, 2)

Patent Owner does not address limitation 1(b)(i) in the Preliminary Response. *See generally* Prelim. Resp.

We reviewed the evidence cited by Petitioner and find that Darlington sufficiently discloses the subject matter of this limitation.

- iv. *Limitation 1(b)(ii): “the first rotatable member comprising a drawstring track”*

Petitioner maps the recited drawstring track to Darlington’s bowstring groove 38. Pet. 12–15 (citing Ex. 1004, Abstract, 1:52–61, 2:42–52, 2:66–3:2, Figs. 1, 2; Ex.¹⁹ 1003 ¶ 42).

Patent Owner does not address limitation 1(b)(ii) in the Preliminary Response. *See generally* Prelim. Resp.

We reviewed the evidence cited by Petitioner and find that Darlington sufficiently discloses the subject matter of this limitation.

- v. *Limitation 1(b)(iii): “[the first rotatable member comprising] a cam track”*

Petitioner asserts the ’989 patent “describes its cam track as providing a contour that contacts the power cables as the bow is drawn.” Pet. 15 (citing Ex. 1001, 3:58–4:3; Ex 1003 ¶ 44). Petitioner maps the recited cam track to Darlington’s cable grooves 50a, b, c of, respectively, the hub 40,

¹⁹ Petitioner refers to Exhibit 1003 as “Dec.” *See e.g.*, Pet. 15.

draw length module 44, and secured section 42. *Id.* at 15–20 (citing Ex. 1003 ¶¶ 44–46; Ex. 1004, 1:23–26, 1:47–50, 1:55–2:2, 2:47–3:34, 3:60–64, 4:7–20, Abstract, Figs. 1–5C).

Patent Owner does not address limitation 1(b)(iii) in the Preliminary Response. *See generally* Prelim. Resp.

We reviewed the evidence cited by Petitioner and find that Darlington sufficiently discloses the subject matter of this limitation.

vi. *Limitation 1(b)(iv): “[the first rotatable member comprising] a capstan and a terminal”*

Petitioner asserts the ’989 patent “describes a capstan that provides a fixed point around which a power cable wraps as it extends from a terminal on a first rotatable member to the opposite rotatable member.” Pet. 20 (citing Ex. 1001, 1:53–59, 4:18–32, 5:26–39, Figs. 1, 2; Ex. 1003 ¶ 47). Petitioner maps the recited capstan and terminal respectively to Darlington’s intermediate post 72 and anchor 56 shown in Figure 4D. *Id.* at 20–21 (citing Ex. 1003 ¶¶ 48, 69; Ex. 1004, 1:42–50, 3:65–4:6, 4:1–6, 4:11–18, Figs. 1, 2, 4A–5C).

Patent Owner does not address limitation 1(b)(iv) in the Preliminary Response. *See generally* Prelim. Resp.

We reviewed the evidence cited by Petitioner and find that Darlington sufficiently discloses the subject matter of this limitation.

vii. *Limitation 1(b)(v): “wherein said drawstring track is oriented in a first cam plane and said cam track is oriented in a second cam plane offset from said first cam plane”*

Petitioner maps the recited first cam plane (drawstring track) and second cam plane (cam track) respectively to the two planes defined by Darlington’s bowstring grooves 38 (i.e., corresponding to the flat surfaces of

the cams 18, 22) and cable grooves 50a, b, c of (i.e., corresponding to the flat surfaces of the hubs 40, draw length modules 44, and secured sections 42). Pet. 21–23 (citing Ex. 1003 ¶ 49; Ex. 1004, 1:59–61, 1:65–2:2, 2:50–52, 2:57–3:13, Abstract, Figs. 1–5C). Petitioner asserts an ordinarily skilled artisan “would have recognized that Darlington’s drawstring track [38] and cam track [50a, b, c] are oriented in different planes because draw length module 44 (providing [cam track 50b]) is ‘mounted on’ the ‘flat base 34’ portion” of Darlington’s cams 18, 22. *Id.* at 23 (citing Ex. 1003 ¶ 49; Ex. 1004, 2:50–61, Fig. 2).

Patent Owner does not address limitation 1(b)(v) in the Preliminary Response. *See generally* Prelim. Resp.

We reviewed the evidence cited by Petitioner and find that Darlington sufficiently discloses the subject matter of this limitation.

viii. Limitation 1(c): “a drawstring extending between the first rotatable member and the second rotatable member”

Petitioner maps the recited drawstring to Darlington’s bowstring cable 28. Pet. 23–24 (citing Ex. 1004, 2:47–49, Fig. 1).

Patent Owner does not address limitation 1(c) in the Preliminary Response. *See generally* Prelim. Resp.

We reviewed the evidence cited by Petitioner and find that Darlington sufficiently discloses the subject matter of this limitation.

ix. Limitation 1(d)(i): “a power cable attached to said terminal and extending toward the second limb”

Petitioner maps the recited power cable to Darlington’s power cable 30 of Figure 4D. Pet. 24–25 (citing Ex. 1004, Fig. 4D). Petitioner contends that an ordinarily skilled artisan “would have recognized that Darlington’s mapped power cable extends from the first rotatable member ‘toward’ the

second limb, though the power cable's distal end is specifically anchored on the second rotatable member (pulley) attached to and supported by the second limb.” *Id.* at 25 (citing Ex. 1003 ¶ 51).

Patent Owner does not address limitation 1(d)(i) in the Preliminary Response. *See generally* Prelim. Resp.

We reviewed the evidence cited by Petitioner and find that Darlington sufficiently discloses the subject matter of this limitation.

- x. *Limitation 1(d)(ii): “said power cable comprising an elongate straight portion located near said first rotatable member, a capstan portion in contact with said capstan and a terminal portion in contact with said terminal”*

Petitioner maps the recited elongate straight portion, capstan portion, and terminal portion respectively to the following portions of Darlington's power cable 30 as shown by Figure 4D's illustration of the lower pulley 22: portion extending from the secured section 42 (not labeled in Figure 4D) to the removable adjustable module 44 of the upper pulley 18 (not shown); portion wrapping intermediate post 72; and portion wrapping the terminal 56. Pet. 25–28 (citing Ex. 1001, 4 4:23–25, 4:46–48, 5:40–45, 5:59–62, Figs 1, 2, 4; Ex. 1003 ¶ 52; Ex. 1004, 1:55–2:2, 3:6–8, 3:20–37, 3:65–4:6, Figs. 4A–4D, 5A–C).

Patent Owner does not address limitation 1(d)(ii) in the Preliminary Response. *See generally* Prelim. Resp.

We reviewed the evidence cited by Petitioner and find that Darlington sufficiently discloses the subject matter of this limitation.

- xi. *Limitations 1(e), 1(f), and 1(g)*

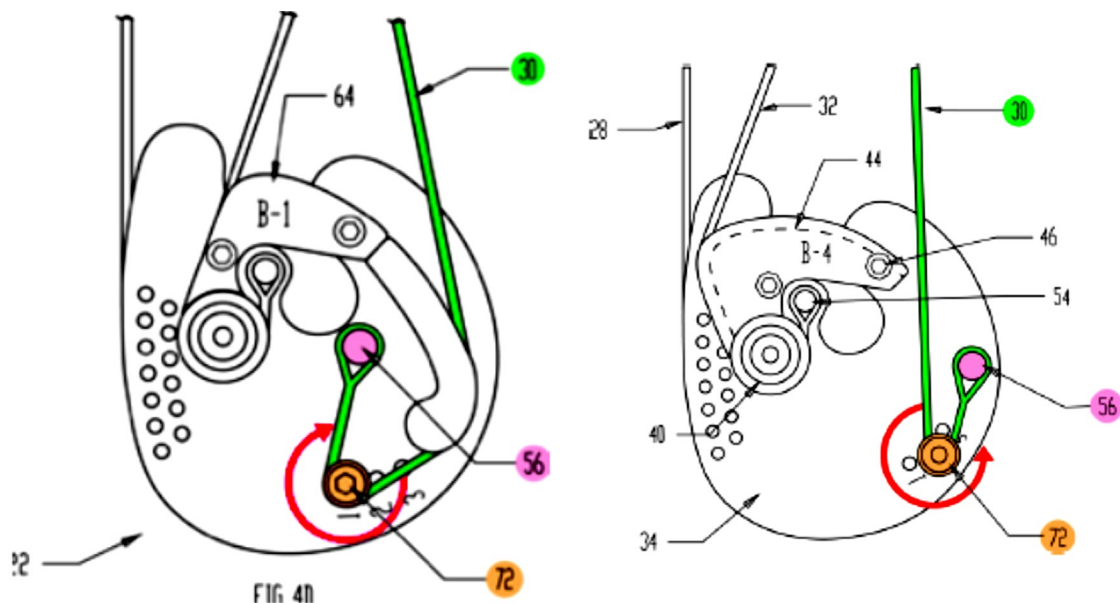
1(e): “wherein, in the brace condition, the power cable wraps around the capstan in a first rotational direction as

the power cable is traversed from the elongate straight portion to the terminal portion; and”

1(f): “when the bow is drawn from the brace condition, the first rotatable member rotates in a second rotational direction that is opposite the first rotational direction and”

1(g): “wherein, in the brace condition, the elongate straight portion defines a plane, wherein said first axle and said terminal are located on opposite sides of said plane.”

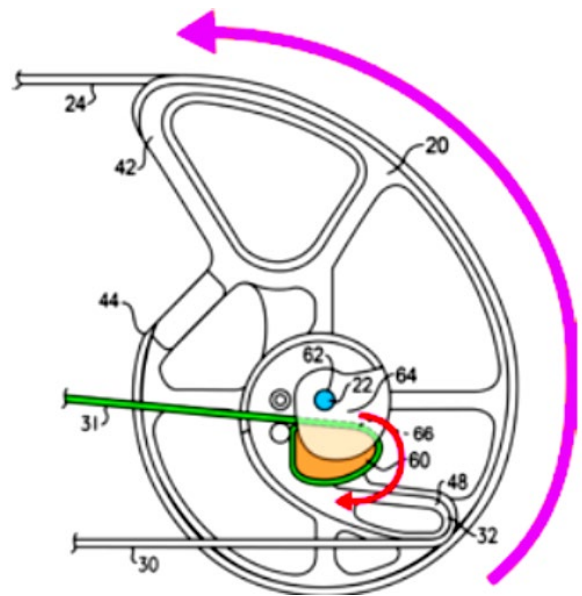
These limitations each involve Petitioner’s proposed modification of Darlington in view of Islas. We begin by reproducing side-by-side Petitioner’s annotations to Darlington’s Figure 4D (on the left) and Petitioner’s proposed modifications to Darlington illustrated on Darlington’s Figure 4A (on the right). The latter is based on its proposed combination of the teachings of Darlington and Islas as discussed in detail below:



Pet. 29, 30. Figure 4D, on the left is an “elevational view[] of the lower pulley [22] of FIG. 2 with the various draw length modules of FIG 3A assembled to the pulley.” Ex. 1004, 2:19–21. Petitioner annotates Figure

4D on the left by shading power cable 30 in green, anchor 56 in pink, intermediate post 72 in orange and adding a red semicircle with an arrow pointing clockwise around intermediate post 72. Pet. 30. On the right, Petitioner modifies original Figure 4A by relocating intermediate post 72 and anchor 56 to the right, removing element 42 (not labelled in original Figures 4A or 4D) and adding a red semicircle with an arrow pointing counterclockwise around intermediate post 72. *Id.*; *see also id.* at 34 (annotating the modified Figure 4A shown above with a magenta semicircle with a semicircular arrow pointing clockwise to illustrate the rotation of lower pulley 22 when Darlington’s bowstring 28 is drawn).

Petitioner provides the annotated version of Islas’ Figure 3 reproduced at right. Pet. 31. Figure 3 “is a side view of the cam assembly, with the bowstring released, i.e., not drawn.” Ex. 1005 ¶ 20. Petitioner annotates Figure 3 by adding a magenta semicircle with a counterclockwise arrow on the exterior of cam 20, shading power cable 31 in green, shading element 60 in orange, and adding a red semicircle with a clockwise arrow around element 60. Pet. 31.



With respect to Islas, Petitioner contends:

As seen . . . in annotated Fig. 3, Islas’s bow includes a power cable (31, light green []) which wraps in a first rotational direction (red arrow) around a cam element (60, orange) to terminate at an “anchor point.” . . . The magenta arrow [] in Fig. 3 indicates the second rotational direction, in which cam 20 (a “first rotational member”) rotates as the bow is drawn. . . . As

discussed by Mr. Lange, the second rotational direction (magenta) for Islas's first rotatable member (cam 20) rotates as the bow is drawn is opposite first rotational direction (red) that Islas's first power cable 31 wraps around element 60 (orange).

Pet. 31–32 (citing Ex. 1003 ¶¶ 55–57; Ex. 1005, ¶¶ 18, 20, 24, 32–34, Fig. 3).

With respect to the proposed modification of Darlington in view of Islas, Petitioner contends:

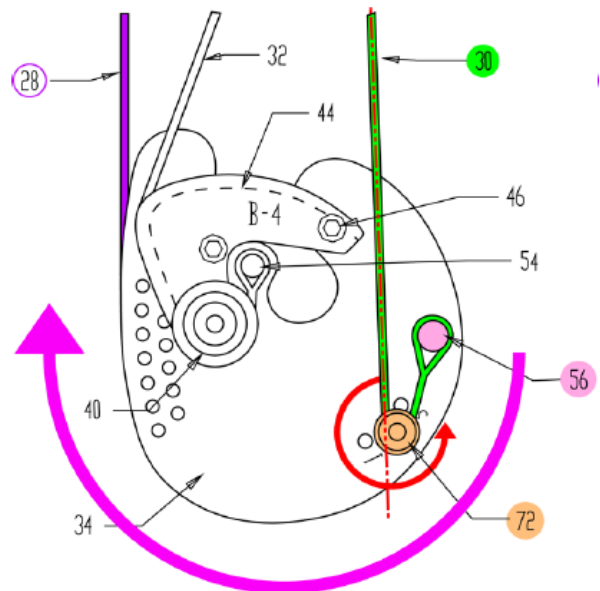
Darlington bow's anchor 56 is modified as taught by Islas such that its power cable wraps outwardly around the capstan 72, (counterclockwise from the illustrated perspective, away from the axis and toward the pulley's periphery). The modified first rotational direction is indicated by a red arrow. . . . The rotation of the pulley as the bow is drawn (the second rotational direction) remains clockwise, as indicated by the magenta arrow. . . . Beneficially, section 42 present in the original Darlington bow is eliminated as unnecessary, simplifying the bow's design and reducing its manufacturing cost. . . . Thus, the proposed combined Darlington+Islas bow renders obvious a second rotational direction (clockwise, magenta) that is opposite its first rotational direction (counter-clockwise, red).

Pet. 33–34 (citing Ex. 1003 ¶¶ 56–61; Ex. 1004, 1:55–65, 3:14–34, Figs. 1, 2).

After reviewing Petitioner's evidence, which is not disputed by Patent Owner, we find that the combination of Darlington and Islas sufficiently teaches the subject matter of limitations 1(e) and 1(f).

Petitioner also maps the recited plane of limitation 1(g) to a plane passing orthogonally through the flat portion 34 of the modified pulley 22 and along the portion of the first power cable 30 extending between the upper and lower pulleys 18, 22. Pet. 44–47 (citing Ex. 1003 ¶ 65; Ex. 1004, Figs. 2, 4D; *id.* 1:55–2:2, 3:14–15, 3:20–37).

Petitioner provides the additionally annotated version of the modified pulley 22 shown at right to illustrate its contention for this limitation. Pet. 47. In this version of Figure 4A, Petitioner modifies original Figure 4A by relocating intermediate post 72 and anchor 56 to the right, removing item 42 (not labelled in original Figure 4A), shading power cable 30 in green with a dashed vertical redline through the middle, shading intermediate post 72 in orange, shading terminal 56 in pink, shading bowstring 28 in purple, adding a red semicircle with a counterclockwise arrow around intermediate post 72, and adding a magenta semicircle with an arrow pointing clockwise on the bottom of pulley 22. *Id.* According to Petitioner, the dashed redline in power cable 30 represents a plane orthogonal to the page corresponding to the plane recited in limitation 1(g) because “the first axle and terminal [56] . . . are located on opposite sides of a plane.” *Id.* at 46.



After reviewing Petitioner’s evidence, which is not disputed by Patent Owner, we find that the combination of Darlington and Islas sufficiently teaches the subject matter of limitation 1(g).

Motivation to Combine/Reasonable Expectation of Success

Petitioner contends that an ordinarily skilled artisan:

would have been motivated, having read Islas, to modify Darlington's bow . . . such that its power cable wrapped around its capstan in a second rotational direction that is opposite its first rotational direction (i.e., outward, toward the periphery of the cam) as recited in limitation 1(f) and taught by Islas for three primary reasons: (1) it would have increased safety and maintainability, (2) it would have simplified the design, resulting in a reduced manufacturing cost and (3) it would have increased the maximum angular sweep the rotatable member could rotate without obstruction from brace to full-draw.

Pet. 36–37.

In support, Petitioner contends that an ordinarily skilled artisan “would have appreciated that it was well-known in the field of designing archery bow cams that any contact between a bow's power cables with one another or unintended elements of the bow's pulley . . . would have resulted in unwanted potentially dangerous effects such as entanglement, abrasion, and fraying” and therefore “would have sought design improvements that would have reduced the likelihood of contact between power cables and any other portion of the bow (including the other power cable).” Pet. 37 (citing Ex. 1003 ¶¶ 59–64). Petitioner further contends, in light of Islas, that an ordinarily skilled artisan “would have been motivated to modify Darlington's bow to reduce the likelihood of unwanted cable contact, simplifying its design by wrapping its power cable *outwards* around its capstan” and “[t]he simplified design would have eliminated the need for section 42, reducing the manufacturing cost of the bow.” *Id.* at 38 (citing Ex. 1003 ¶¶ 55–64). According to Petitioner, “the elimination of section 42 in the modified Darlington + Islas design would have increased the maximum amount the bow's pulleys would have been able to rotate without contacting other portions.” *Id.* at 39 (citing Ex. 1003 ¶ 63).

Petitioner also contends that Darlington provides the following additional motivation:

Notably, Darlington explains that intermediate post 72 is “adjustably positionable” to configure the stresses in the limbs during draw. Having read this description, a [person of ordinary skill in the art] would have found it obvious and appropriate to modify Darlington’s bow pursuant to Islas’s disclosure, relocating intermediate post 72 (capstan) such that first power cable 31 wraps around post 72 outwards, toward the periphery of the pulley for the motivations discussed above of improving safety, reducing maintenance costs while simplifying the design, and increasing the maximum amount the pulleys were able to rotate from brace to full-draw.

Pet. 40 (citing Ex. 1003 ¶¶ 58–62; Ex. 1004, 3:35–4:20). Petitioner additionally asserts that Darlington evidences a reasonable expectation of success for the combination because:

Both the simple nature of the modification and the express intent of Darlington towards modification would have supported a reasonable expectation of success for a [person of ordinary skill in the art] to make the combination without undue experimentation. Specifically, a [person of ordinary skill in the art] would have had a reasonable expectation of success for the combination of Darlington and Islas because all of the physical components necessary were already found in Darlington, and the modification per Islas would have only required minor reconfigurations of those physical components.

Pet. 40–41 (citing Ex. 1003 ¶¶ 58–62).

Similarly, as discussed above, Darlington expressly teaches that portions of its removable draw length module (e.g. draw length module 44 and section 42) are intended to be removable (e.g., via screws) and “replaceable” with components of alternative shapes corresponding to any desired draw cycle. . . . A [person of ordinary skill in the art] would have had the skills necessary and the motivation to replace module 44 with an

alternative module 44 sized and/or shaped to facilitate the desirable combination of Darlington and Islas.

Pet. 41–42 (citing Ex. 1003 ¶ 58; Ex. 1004, 1:32–38, 2:50–65, 3:38–4:20, Figs. 2–5C).

Patent Owner responds that Darlington and Islas, alone and in combination, do not suggest the claimed reverse-wrap of the power cable. Prelim. Resp. 58–63.

Patent Owner first argues that “[t]he ’989 Patent does not name the power cable ends, but for convenience of reference here we refer to them as the ‘take up end’ and ‘control end,’ respectively. In the ’989 Patent, the take up end wraps onto the cam module of the cam as the bow is drawn, and thus is ‘taken up’ onto the cam module,” but “[t]he control end remains fixed, attached to the bow axle, as the bow is drawn.” Prelim. Resp. 58 (citing Ex. 1001, 3:32–42, Fig. 7). Patent Owner argues that Darlington and Islas differ from the ’989 patent in this respect.

Patent Owner contends that in Darlington “both ends of each power cable are attached to a cam (pulleys 18/22).” Prelim. Resp. 58 (citing Ex. 1004, 3:14–37, Figs. 1–2.). According to Patent Owner, when Darlington’s bow is drawn, “one end of the power cable (i.e., the take up end) is wrapped or taken up in cable groove sections of one pulley, while the opposite end (referred to herein as the “let out end”) is unwrapped from, or let out of, the groove sections of the opposite pulley.” *Id.* at 58–59.

Patent Owner contends that “Islas’s cams have the same general configuration as Darlington – both ends of power cables (31/32) wrap

inward towards the center of the cam.” Prelim. Resp. 61–62. Patent Owner further argues that “the take up end of Islas’s power cable wraps in the same direction that the cam rotates when the bow is drawn, and the let out end wraps in the opposite direction.” *Id.* at 62 (citing Ex. 1004, Fig. 4D; Ex. 1005, Fig. 3).

Based on the distinction between let-out and take up ends of the power cables, Patent Owner contends Petitioner’s argument that “Islas power cable 31 wraps in a rotational direction that is opposite to the rotational direction of Islas’s cam 20 is misleading.” Prelim. Resp. 63 (citing Pet. 31–32). Patent Owner further contends that Petitioner “points to the let out end of Islas’s power cable as though it were the take up end of a power cable wrapped opposite to the cam’s rotational direction during draw.” *Id.* According to Patent Owner, “[t]his is [] significant because, Ravin then argues that it would have been obvious to wrap Darlington’s take up end like Islas’s let out end. [] Yet, as discussed and shown above, Darlington’s cams show a similar configuration of [the] let out end as Islas.” *Id.* at 63–64.

Patent Owner next contends that Petitioner’s entire obviousness analysis “hinges on its misapplication of Islas” and “fails to account for the differences in purpose and function of the power cable take up and let out ends.” Prelim. Resp. 65. According to Patent Owner, an ordinarily skilled artisan “would not have modified the wrapping direction of Darlington’s take up end based on Islas’s let out end because of the differences in purpose and function of the take up end and let out end.” *Id.* (citing Ex. 2007 ¶¶ 84, 87). Patent Owner further argues that Petitioner’s combination is based on improper hindsight. *Id.* at 65–66.

For the following reasons, Patent Owner’s arguments do not undercut Petitioner’s showing at this stage of the proceeding.

Patent Owner does not dispute and, in fact, acknowledges that Islas’s “let out end wraps in the opposite direction” of the “cam . . . when the bow is drawn.” Prelim. Resp. 62.

The crux of Patent Owner’s contentions that an ordinarily skilled artisan would not have been motivated to combine the teachings of Darlington and Islas is that the functions of the take up and let out ends of the cams disclosed in Darlington and/or Islas are different. To evaluate this argument, we first examine the language of claim 1.

Claim 1 recites a first rotatable member and a second rotatable member. Ex. 1001, 6:52–53. Patent Owner’s “reverse wrap” concept, as claimed, is recited with respect to only one of the rotatable members, i.e., the first rotatable member. *Id.* at 6:66–7:8. Claim 1 does not limit the first rotatable member to either a take up end or a let out end. *See id.* Patent Owner does not propose a construction of claim 1 that would limit the first rotatable member to a take up end. *See generally* Prelim. Resp. Consequently, at this stage of the proceeding, it appears arguments regarding allegedly different functions of the take up and let out ends of Darlington and/or Islas are not commensurate with the scope of claim 1.

Further, Patent Owner does not directly address Petitioner’s reasons why an ordinarily skilled artisan would have been motivated to combine the teachings of Darlington and Islas with a reasonable expectation of success. *See generally* Prelim. Resp. Rather, Patent Owner’s arguments against the proposed combination are based on the distinction between let out and take up ends of the cited references. *See id.* at 63–65. Patent Owner relies on the

testimony of Dr. Reinholtz in support of this argument. However, Dr. Reinholtz merely restates Patent Owner’s arguments that an ordinarily skilled artisan would have recognized the distinction between the function of take up and let out ends of power cables and “would not have incorporated features from the ‘let out’ end of a power cable to the ‘take up’ end of a power cable because the ‘let out’ end and the ‘take up’ end perform different functions, namely, to ‘let out’ or ‘take up’ the power cable respectively.” Ex. 2007 ¶ 84. As discussed above, at this stage of the proceeding, we preliminarily determine that this argument is not commensurate with the scope of claim 1.

For these reasons, we find that Petitioner sufficiently shows that an ordinarily skilled artisan would have been motivated to combine Darlington and Islas with a reasonable expectation of success for the reasons stated by Mr. Lange. Ex. 1003 ¶¶ 58–64. His testimony is sufficiently supported by citations to Darlington and Islas as well as other references supporting his testimony of the knowledge of a person of ordinary skill in the art. *Id.* ¶ 59 (citing Ex. 1007, 1008). Because his testimony is sufficiently supported by evidence, Patent Owner’s contention that the proposed combination is based on improper hindsight is unavailing based on the present record. *See In re Cree*, 818 F.3d 694, 702, n.3 (Fed. Cir. 2016).

2. Summary of Claim 1

For the foregoing reasons, we determine that Petitioner establishes a reasonable likelihood that claim 1 is unpatentable over Darlington and Islas.

3. Claims 2–4, 8–10

Claims 2–4 and 8–10 depend from claim 1. Ex. 1001, 7:9–47. Petitioner provides additional contentions and evidence concerning the

limitations of these dependent claims. Pet. 47–68. Patent Owner does not address these dependent claims in the Prelim. Resp. *See generally* Prelim. Resp.

We reviewed Petitioner’s contentions and evidence for these claims and find that Petitioner establishes a reasonable likelihood that claims 2–4 and 8–10 are unpatentable over Darlington and Islas.

4. *Claim 11*

For independent claim 11, Petitioner relies on its contentions and evidence for claim 1 for most of the limitations for claim 11 except for limitation 11(g). Pet. 68–73. Petitioner provides additional contentions and arguments concerning limitation 11(g). *Id.* at 70–73.

Patent Owner doesn’t dispute the evidence but argues, similar to claim 1, that “[n]either Darlington nor Islas disclose these limitations [11(f), 11(g)] without recourse to [Petitioner’s] hindsight based modifications.” Prelim. Resp. 68. As discussed above for claim 1, Patent Owner’s hindsight argument is unavailing based on the present record.

We reviewed Petitioner’s contentions and evidence for claim 11 and find that Petitioner establishes a reasonable likelihood that claim 11 is unpatentable over Darlington and Islas.

5. *Claim 12*

For independent claim 12, Petitioner relies on its contentions and evidence for claim 1 for many of the limitations for claim 12 except for limitations 12(b)(ii), 12(c)(ii), 12(e)(i), 12(e)(ii), and 12(f)(i). Pet. 74–87. Petitioner provides additional contentions and arguments concerning these limitations. *Id.*

Patent Owner doesn't dispute the evidence but argues, similar to claim 1, that "[n]either Darlington nor Islas disclose these limitations [12(e)(ii), 12(f)(ii)] without recourse to [Petitioner's] hindsight based modifications." Prelim. Resp. 68. As discussed above for claim 1, Patent Owner's hindsight argument is unavailing based on the present record.

We reviewed Petitioner's contentions and evidence for claim 12 and find that Petitioner establishes a reasonable likelihood that claim 12 is unpatentable over Darlington and Islas.

6. Claims 13–18

Claims 13–18 depend from claim 12. Ex. 1001, 8:39–9:3. Petitioner either refers back to its contentions for claims 2, 3, 4, 6, and 12 and/or provides additional contentions and evidence concerning the limitations of these dependent claims. Pet. 87–90. Patent Owner does not address these dependent claims in the Prelim. Resp. *See generally* Prelim. Resp.

We reviewed Petitioner's contentions and evidence for these claims and find that Petitioner establishes a reasonable likelihood that claims 13–18 are unpatentable over Darlington and Islas.

7. Claim 19

For independent claim 19, Petitioner relies on its contentions and evidence for claims 1, 10, and 11 for many of the limitations for claim 19 except for limitation 19(f)(i). Pet. 90–93. Petitioner provides additional contentions and arguments concerning this limitation. *Id.*

Patent Owner doesn't dispute the evidence but argues, similar to claims 1, that "[n]either Darlington nor Islas disclose this limitation [19(e)] without recourse to [Petitioner's] hindsight based modifications." Prelim.

Resp. 68–69. As discussed above for claim 1, Patent Owner’s hindsight argument is unavailing based on the present record.

We reviewed Petitioner’s contentions and evidence for claim 19 and find that Petitioner establishes a reasonable likelihood that claim 19 is unpatentable over Darlington and Islas.

III. CONCLUSION

Based on the present record, we determine that Petitioner demonstrates a reasonable likelihood that it would prevail in establishing that at least one challenged claim of the ’989 patent is unpatentable. We, thus, institute an *inter partes* review of all challenged claims of the ’989 patent based on all grounds in the Petition. At this stage of the proceeding, we have not made a final determination under 35 U.S.C. § 318(a) with respect to the unpatentability of any challenged claim.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of the ’989 patent is instituted with respect to all challenged claims and the ground set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(a) and 37 C.F.R. § 42.4(b), *inter partes* review of the ’989 patent shall commence on the entry date of this Order, and notice is hereby given of the institution of a trial.

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