

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

RAVIN CROSSBOWS, LLC,
Petitioner

v.

MCP IP, LLC,
Patent Owner

Case IPR2024-00522
Patent No. 8,683,989

PATENT OWNER'S RESPONSE

TABLE OF CONTENTS

I.	INTRODUCTION.....	1
II.	THE '989 PATENT – The “Reverse Wrap”	2
III.	DARLINGTON DOES NOT QUALIFY AS PRIOR ART	5
	A. Mathew McPherson designed, sold, and shipped tens of thousands of operational bows before Darlington’s filing date that embodied the Challenged Claims of the '989 patent.....	6
	B. Production models of both Mathew McPherson’s Menace bow and Monster bow were independently reviewed by Bill Krenz, an editor at Inside Archery.....	15
	C. The Menace bow embodies all the limitations of claims 1, 3-4, 8-14, and 16-19 of the '989 patent.	25
	1. Claim 1	32
	2. Claim 11	39
	3. Claim 12	43
	4. Claim 19	47
	5. Claims 3 & 14	48
	6. Claims 4 & 16	49
	7. Claim 8	50
	8. Claims 9 & 18	55
	9. Claim 10	57
	10. Claim 13	58
	11. Claim 17	60
	D. The Monster bow embodies all the limitations of claims 1-4 and 7-19 of the '989 patent.....	61
	1. Claim 1	61
	2. Claim 11	66
	3. Claim 12	67
	4. Claim 19	70
	5. Claims 2 & 15	71
	6. Claims 3 & 14	72

7. Claims 4, 7, & 16	72
8. Claim 8.....	73
9. Claims 9 & 18	74
10.Claim 10.....	74
11.Claim 13	75
12.Claim 17.....	76
E. Provisional Application.....	76
IV. PETITIONER FAILS TO SHOW THAT THE CLAIMS WOULD HAVE BEEN OBVIOUS.....	81
A. Petitioner fails to apply foundational principles of obviousness law in creating its modified bow cam.....	82
B. Petitioner fails to show that a POSITA would have been motivated to combine teachings from Islas with those of Darlington.	97
1. Petitioner’s modified Darlington pulley would not increase “the maximum angular sweep the rotatable member could rotate without obstruction from brace to full-draw.”	103
2. Petitioner’s modified Darlington cam would increase cable wear not reduce it.....	104
3. Petitioner’s modified Darlington pulley has a multitude of design problems.....	107
C. Darlington and Islas fails to disclose multiple limitations of the independent claims.....	108
1. Independent Claim 1	109
2. Independent Claim 11	109
3. Independent Claim 12	110
4. Independent Claim 19	110
V. CONCLUSION	111

EXHIBITS

EX2001	US Provisional Patent Application No. 61/247,473 (“’473 <i>Provisional</i> ”)
EX2002	Inside Archery Bow Report – 2009 Mission Menace (“ <i>Menace</i> ”)
EX2003	Inside Archery Bow Report – Mathews McPherson Series Monster (“ <i>Monster</i> ”)
EX2004	US Patent Application No. 12/248,467 as filed (“ ’467 <i>Appl.</i> ”)
EX2005	US Patent Publication No. 2010/0089375 (“ ’375 <i>Pub.</i> ”)
EX2006	Declaration of Mathew McPherson
EX2007	First Declaration of Charles F. Reinholtz, PhD
EX2008	Declaration of Jeffrey A. Ozanne
EX2009	MCP’s Responses to Ravin Crossbow, LLC’s First Set of Interrogatories, Case No. 3:23-CV-00142-JDP
EX2010	Lange - Deposition Exhibit 2010
EX2011	Lange - Deposition Exhibit 2011
EX2012	Deposition of Joshua Lange - Transcript
EX2013	Inside Archery December 2008 Issue – Full Magazine
EX2014	Inside Archery June 2009 Issue – Full Magazine
EX2015	Declaration of Eduardo Rother of Inside Archery

EX2016	Declaration of Jerrod Hoff (PROTECTIVE ORDER MATERIAL)
EX2017	Second Declaration of Jeffrey A. Ozanne
EX2018	Second Declaration of Charles F. Reinholtz, PhD
EX2019	Mathews Public Corporate Records
EX2020	Animation of Darlington Cam Rotation
EX2021	Animation of Islas Cam Rotation

I. INTRODUCTION

The Petition presents a single, flawed, invalidity ground and relies on a primary reference (Darlington) that is not prior art to the U.S. Patent No. 8,683,989 (the “’989 Patent”). Petitioner’s case cannot prevail.

Mathew McPherson reduced the invention of the ’989 Patent to practice well before Darlington’s filing date. And Petitioner knew that when it filed this Petition. Almost two months before filing, Petitioner had possession of the Inside Archery magazine article (EX2002) demonstrating a bow embodying the ’989 Patent at least six months before Darlington. See EX2009, 8.¹ Moreover, McPherson, through two of his related companies, manufactured, sold, and shipped more than twenty thousand production bows embodying the claims of the ’989 Patent before Darlington’s filing date.

Furthermore, Petitioner has shown no prior art disclosing the fundamental feature of McPherson’s invention – a compound bow cam with a “reverse wrapped”

¹ MCP disclosed its prior reduction to practice to Petitioner in response to interrogatories in the co-pending litigation (MCP IP, LLC v. Ravin Crossbows, LLC, Case No. 3:23-cv-00142-JDP (WDWI)). MCP also provided Petitioner with a copy of Mission Meanace Bow Report article from the December 2008 issue of *Inside Archery* as early as January 5, 2024.

power cable. Instead, Petitioner concocts a modified cam informed by the '989 Patent itself. The prior art in both instances, Darlington and Islas, teaches the same power cable wrap directions. Petitioner's faulty motivations for combining the actual teachings of the prior art require logical leaps to create the proposed modified cam.

In short, Petitioner has not made the necessary showing. The claims of the '989 Patent are patentable.

II. THE '989 PATENT – The “Reverse Wrap”

Mathew McPherson has a long history of bow design dating back 50 years. The '989 Patent is a result of that expertise, and describes a unique design for a compound bow cam that McPherson developed in 2008. EX2006, ¶¶6-8. McPherson's design places the terminal post that anchors the take up end of a power cable at an outer edge of bow's cam, while traditional cam designs position a corresponding terminal near the center of the cam. *Compare, e.g.*, McPherson's “reverse wrap” cam, EX1001, FIG. 1 (element 32) to traditional the cam EX1004, FIG. 4D (element 56); Pet., 20-21. To locate a terminal post near the outer edge of a bow's cam it is desirable to wrap the power cable around a capstan in a direction opposite the direction of cam rotation during draw. As the '989 Patent describes:

[T]he location of the terminal post 32 and the shape of the capstan 30 result in the power cable 24 wrapping around the capstan 30 in a direction away from the axle 18 before terminating on the post 32. In

some embodiments, the cable wraps around the capstan 30 in a direction opposite the direction of cam 10 rotation as the bowstring 20 is drawn. As shown in FIG. 1, the cam 10 will rotate in a first rotational direction 76 (e.g. clockwise) when drawn, and the power cable 24 wraps around the capstan 30 and extends toward the terminal post 32 in a second rotational direction 78 (e.g. counter-clockwise) that is opposite the first rotational direction as the power cable 24 is traversed from the elongate straight portion 28 toward the terminal portion 36. EX1001, 4:33-45.

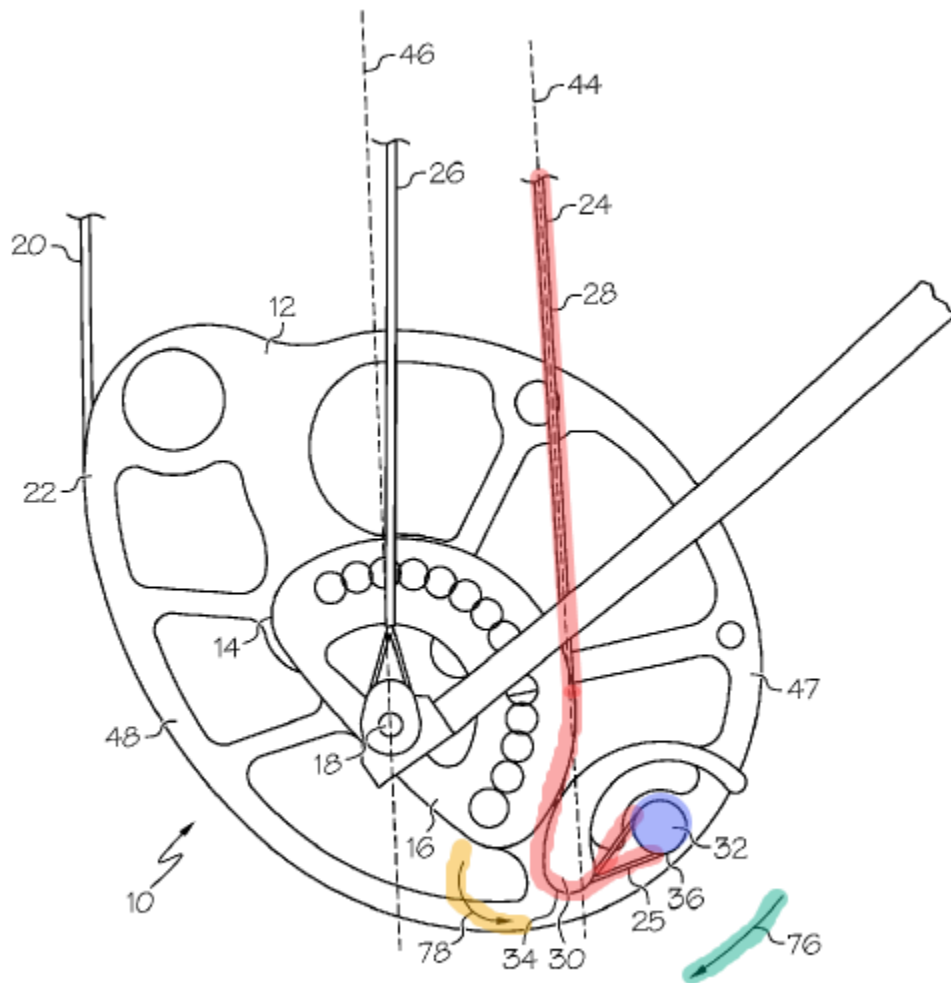


FIG. 1

EX1001, FIG. 1 (annotated).

This new design is referred to here, for convenience, as a “reverse wrap,” because the power cable take up end is wrapped in a direction that is reverse (opposite) to the draw rotation of the cam. *See* EX2018, ¶¶29-31. In addition to the power cable wrap direction itself, this general “reverse wrap” concept resulted in

several features recited in the independent claims² that made Mr. McPherson's cam design unique among the prior art of the time.

- In the brace position, the “reverse wrap” positions the terminal post and the cam's axle on opposite sides of a plane formed by the straight portion of the power cable that extends toward the opposite bow cam. *See, e.g.*, EX1001, col. 4:46-48, FIG. 1, claim 1.
- The “reverse wrap” positions the cam's capstan closer to the power cable than the terminal post when the bow is drawn, thus, providing “added draw capability.” *See, e.g.*, EX1001, col. 5:15-21, FIGS. 2, 5, claims 11, 19.
- The “reverse wrap” positions the terminal further from the bow's axle plane than the capstan. *See, e.g.*, EX1001, col. 4:57-59, claim 12.

III. DARLINGTON DOES NOT QUALIFY AS PRIOR ART

Petitioner cannot show that the Challenged Claims are obvious because Darlington (EX1004), the primary reference in Petitioner's sole ground of unpatentability, does not qualify as prior art. Darlington's earliest priority date is its filing date on June 30, 2009. *Id.*, 5; EX1004. MCP's inventor Mathew McPherson

² Claims 1, 11, 12, and 19.

designed, built, and commercialized the invention claimed by each and every Challenged Claim in 2008, before Darlington's §102(e) (pre-AIA) date. *See*, EX2006; EX2016³; EX2017; EX2018. Here, MCP provides inventor testimony and independent corroborating evidence to show that **all of the Challenged Claims** were embodied by two of Mr. McPherson's bows that were launched before Darlington's filing date. *Drinkware*, No. IPR2013-00131 at 12 (citing *Cooper v. Goldfarb*, 154 F.3d 1321, 1327 (Fed. Cir. 1998)). Petitioner has not and cannot demonstrate that it is likely to succeed in proving the Challenged Claims of the '989 Patent is unpatentable (35 U.S.C. § 314(a)), because the sole ground presented in the Petition relies on a primary reference that is not prior art. 35 U.S.C. § 102(e) (Pre-AIA); *see, e.g., Sequenom v. Leland Stanford Junior Univ.*, No. IPR2013-00390, at 5 (P.T.A.B. Nov. 25, 2014); *Dynamic Drinkware LLC v. Nat'l Graphics, Inc.*, No. IPR2013-00131, at 7 (P.T.A.B. Sept. 12, 2014) *aff'd*, 800 F.3d 1375 (Fed. Cir. 2015).

A. Mathew McPherson designed, sold, and shipped tens of thousands of operational bows before Darlington's filing date that embodied the Challenged Claims of the '989 patent.

Before Darlington's filing date, June 30, 2009, Mr. McPherson designed and built the Mission Menace and Mathews McPherson Series Monster bows, each of

³ EX2016 is both PROTECTIVE ORDER MATERIAL and has been redacted to obscure personal information of customers.

which embodied the claims of the '989 patent. *In re Asahi/America Inc.*, 68 F.3d 442, 445 (Fed. Cir. 1995); *Fox Grp., Inc. v. Cree, Inc.*, 700 F.3d 1300, 1305 (Fed. Cir. 2012). The Mission Menace bow was designed and built in 2008 and the product was first shipped to customers on September 26, 2008. EX2006, ¶9; EX2016, ¶12, App A. The Monster bow was designed and built in 2008. EX2006, ¶16; EX2016, ¶12. The Monster bow was first shipped to customers on February 27, 2009. EX2016, ¶19, App. C. Both bow models 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, ¶¶ 15, 23; *see also*, ¶8; EX2016, ¶¶12, 19. *In re Steed*, 802 F.3d 1311, 1316 (Fed. Cir. 2015).

In fact, over twenty thousand production model bows embodying the claims of the '989 patent were sold, manufactured, and shipped prior to Darlington's filing date. EX2016, ¶¶12, 19. Mathews Archery's business records fully corroborate Mr. McPherson's testimony that his companies Mission Archery and Mathews Archery built, sold, and shipped Mission Menace and Mathews Monster bows prior to June

30, 2009.⁴ EX2016; EX2019; *Cooper*, 154 F.3d at 1330; *see also Fleming v. Escort Inc.*, 774 F.3d 1371, 1377 (Fed. Cir. 2014) (the corroboration requirement “is a flexible, rule-of-reason demand for independent evidence that, as a whole, makes credible the testimony of the purported prior inventor with regard to conception and reduction to practice of the invention as claimed.”).

The production Mission Menace and Mathew’s Monster bows embodied the invention of the ’989 patent. As McPherson testifies, FIGS. 1-6 of the ’989 patent were generated based on the CAD models for the production bows. EX2006, ¶8. To corroborate this fact, photographs of two initial production run Mission Menace bows and one initial production run Mathews Monster bow are made of record. EX2016, ¶¶17-18, 24-26; EX2017, App. A-C.⁵ Each bow was produced and shipped prior to June 30, 2009. *Id.*

⁴ “Mathews Archery is used to refer collectively to both Mathews Archery, Inc. and Mission Archery, which were both owned by Mr. McPherson. EX2006, ¶¶ 2, 8; EX2019.

⁵ Each bow was received from a customer as part of a bow upgrade program. Mission Menace bow serial 937455 (“Menace ’455 bow”) was shipped on November 4, 2008, Mission Menace serial number 940817 (“Menace ’817 bow”)

Jerrod Hoff was the Director of Operations at Mathews Archery in 2008 and 2009 and was personally involved with the “the manufacture, inventory and shipping of the Mission Menace and Mathews Monster bow lines in 2008 and 2009.” EX2016, ¶4. He has personally confirmed that each of these three production bows match Mathews Archery’s business records for Mission Menace and Mathews Monster bows manufactured and shipped prior to June 30, 2009. EX2016, ¶¶17-18, 24-26. Regarding the two Mission Menace bows Mr. Hoff states:

I have personally inspected these two bows and they are Menace bows and the serial numbers appear to be unaltered. Photos of these two bows are copied below from EX2017. Each of these bows bear the same serial number as our shipping records (Appendix A) and match the Make and Model description of the shipping records, i.e., camouflage left-handed (Menace ’817) and right-handed (Menace ’455) bows. EX2016, ¶18.

And, regarding the Mathews Monster, Mr. Hoff states:

that was shipped on November 18, 2008, and Mathews Monster serial number 986775 (“Monster ’775 bow”) that was shipped on April 21, 2009. EX2016, ¶¶17, 24.

I have personally inspected this bow and it is a Monster bow and the serial number appears to be unaltered. Photographs of this bow are copied below from EX2017. This bow bears the same serial number as our shipping records (Appendix C) and matches the Make and Model description of the shipping records, i.e., camouflage right-handed 27-inch draw length Monster bow. EX2016, ¶25.

Furthermore, the cams of each bow are substantially the same as the cams depicted in the '989 patent. EX2006, ¶¶11, 19; EX2016, ¶26. This fact is demonstrated in detail in §§II.C & II.D. However, it is also clearly observable even to the casual observer from the photographs below showing the Menace '817 and the Monster '775 alongside FIGS. 1, 2, 4, and 5 of US Pat. No. 8,683,989.

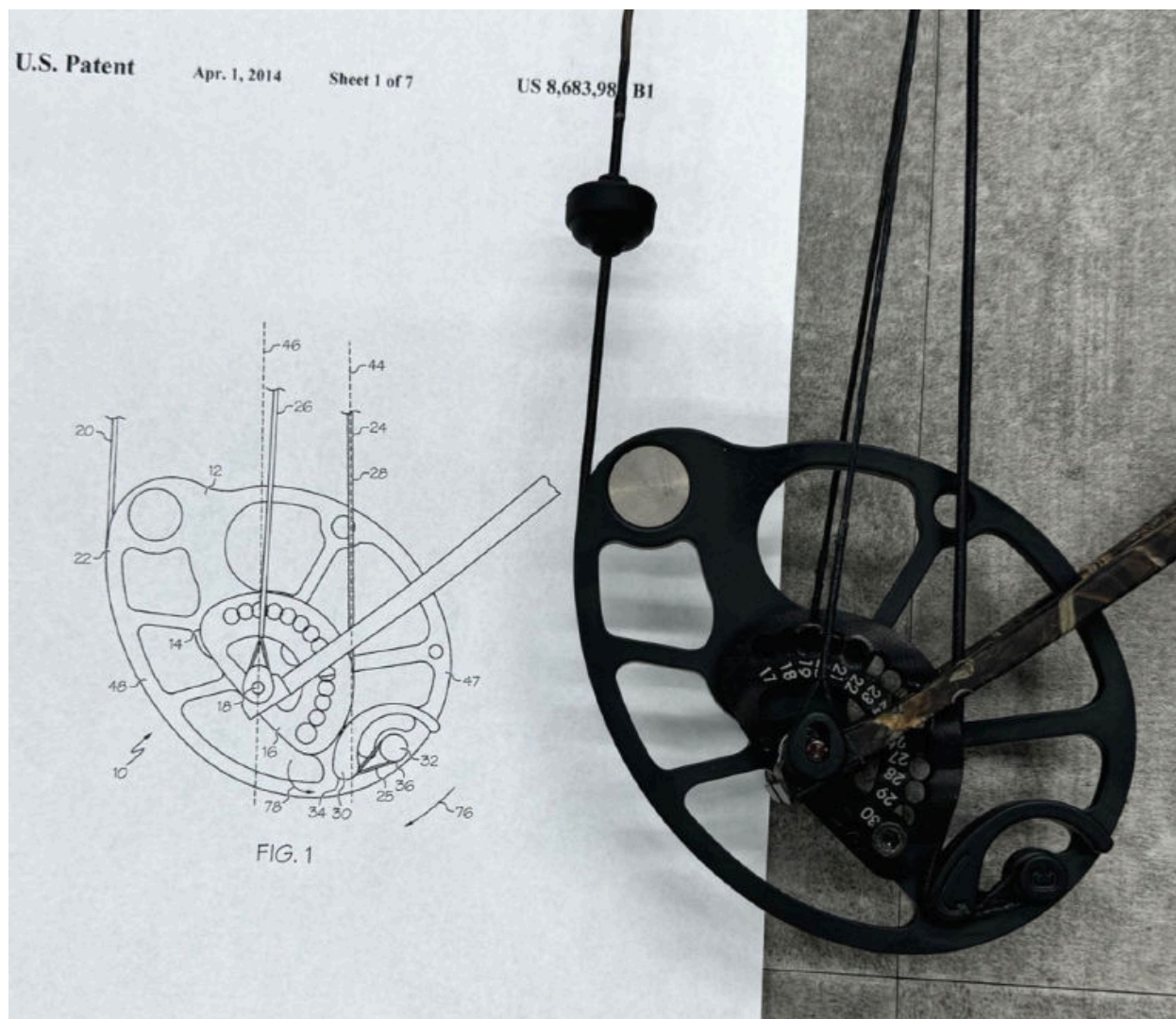


Photo 6: Menace '817 bow upper cam in brace condition next to FIG. 1 of US Pat. No. 8,683,989.

EX2017, App. B.

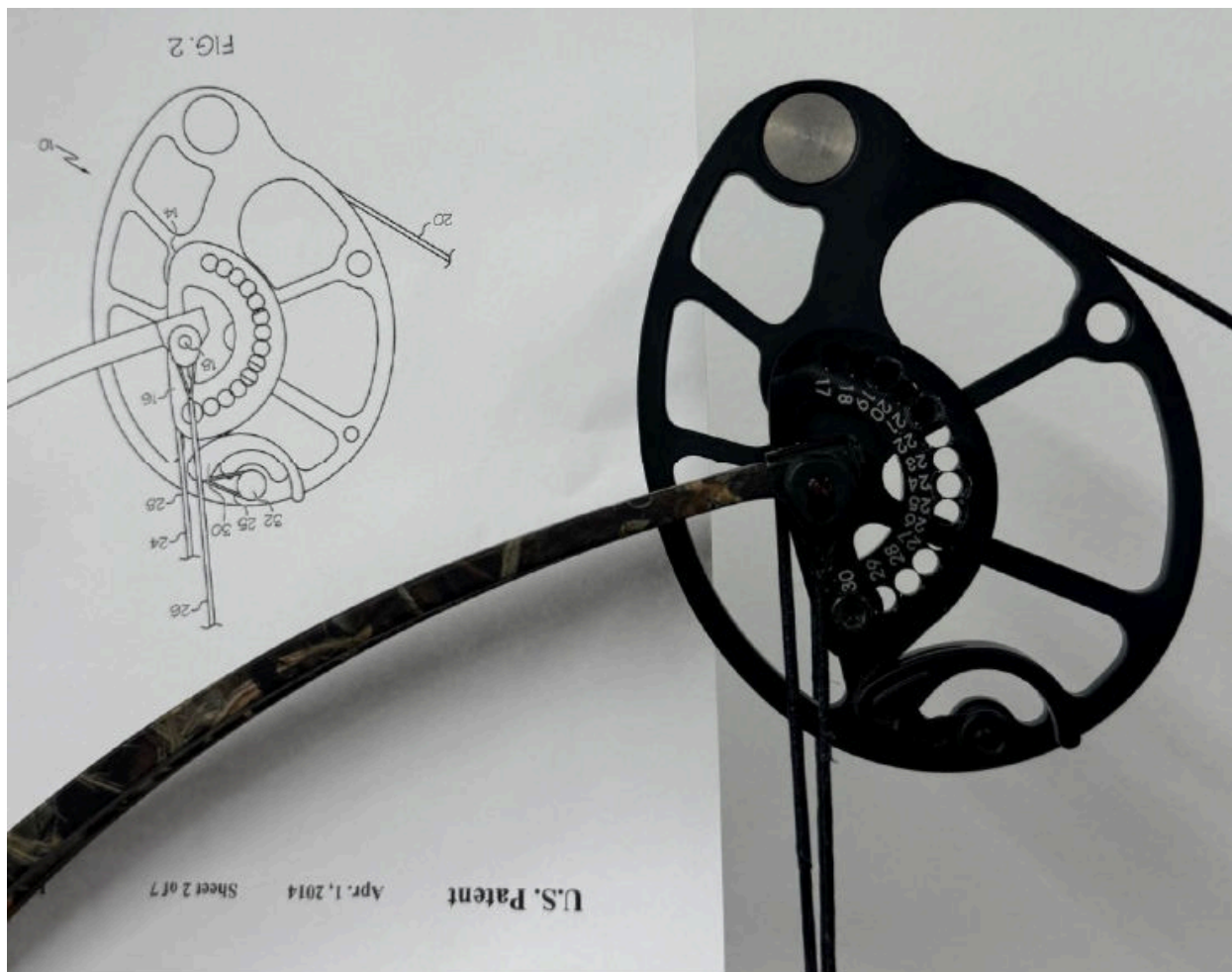


Photo 9: Menace '817 bow upper cam in drawn condition next to FIG. 2 of US Pat. No. 8,683,989.

EX2017, App. B.

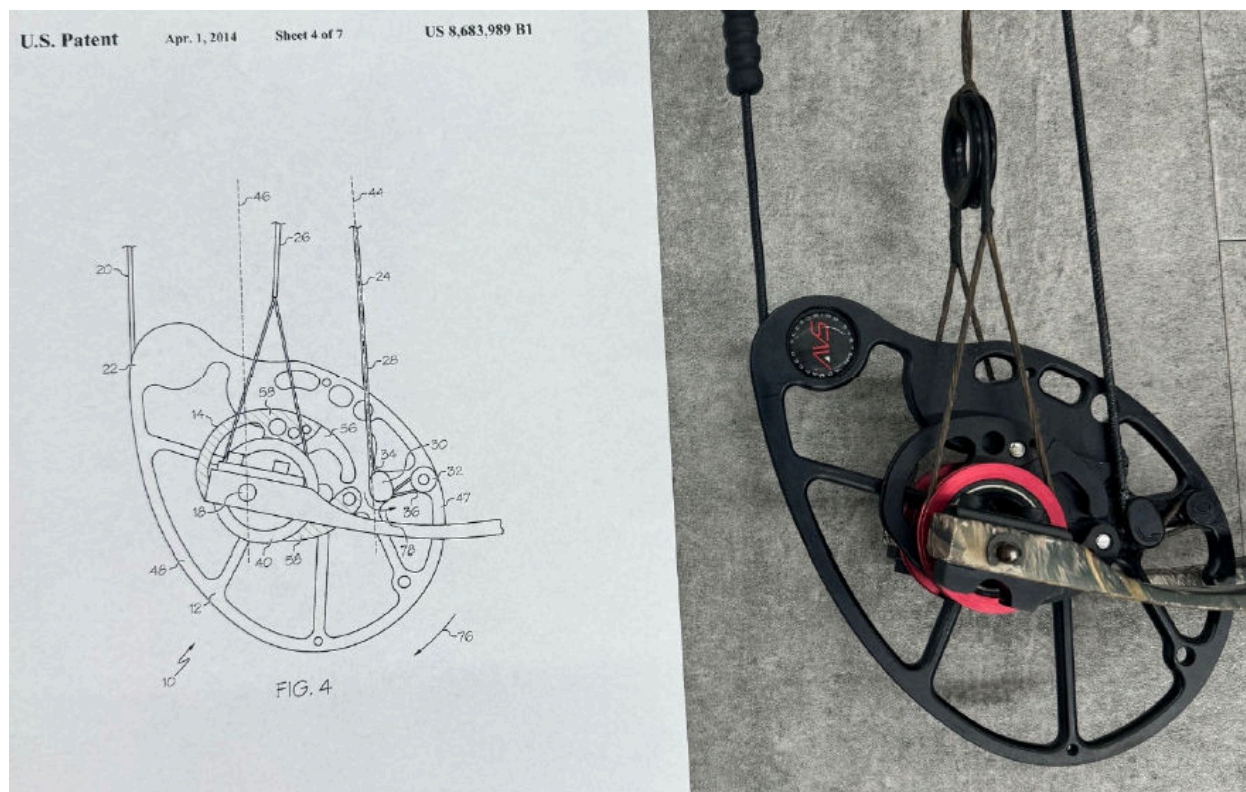


Photo 5: Monster '775 bow lower cam in brace condition next to FIG. 4 of US Pat. No. 8,683,989.

EX2017, App. C.

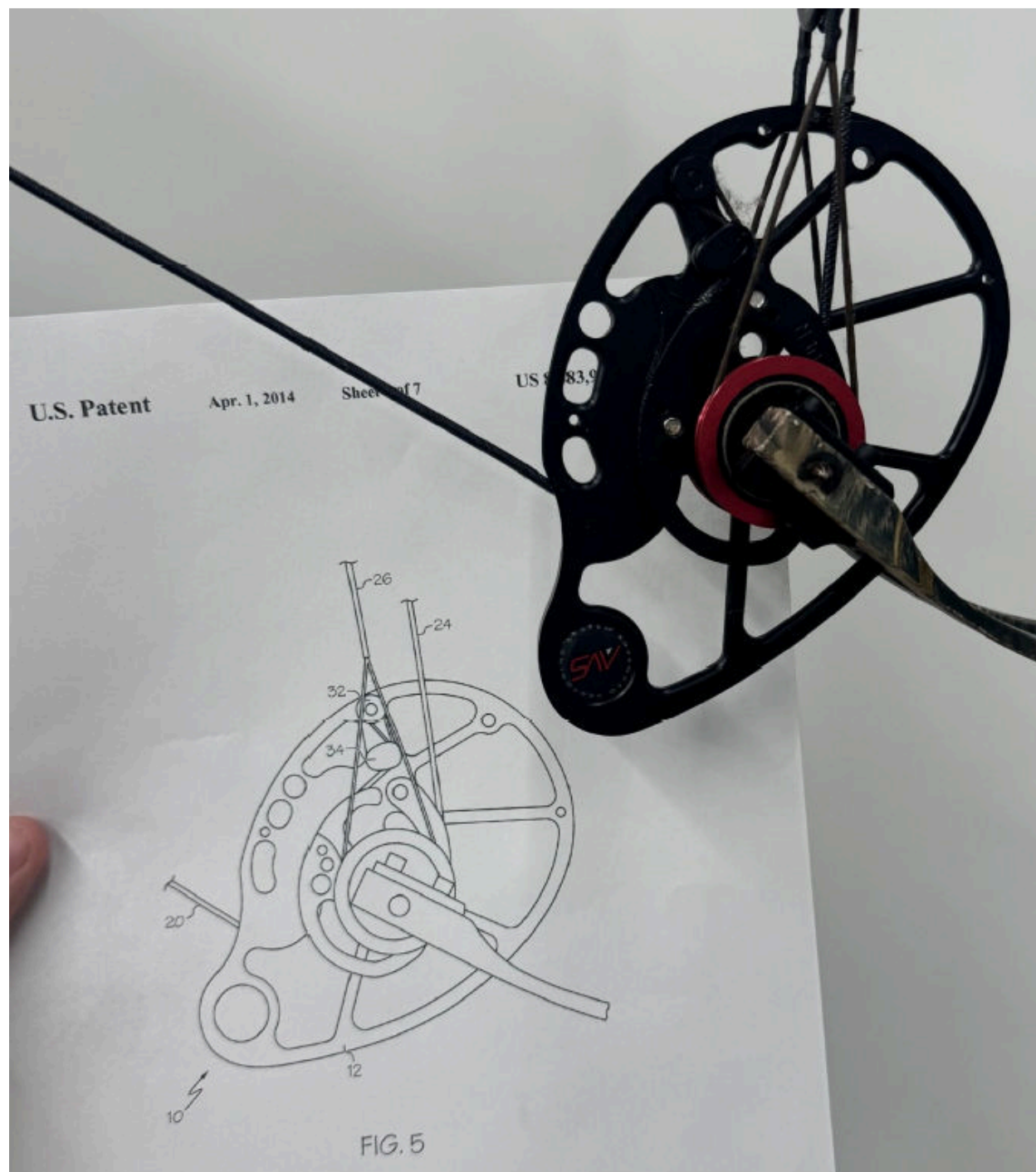


Photo 8: Monster '775 bow lower cam in drawn condition next to FIG. 5 of US Pat. No. 8,683,989.

EX2017, App. C.

These production bows, and those discussed below that were shipped to Inside Archery, represent only a sample of the over twenty thousand production model bows embodying the '989 patent that were shipped to customers prior to Darlington's filing date. Mathews Archery's business records indicate that in total "12,110 Mission Menace bows ... were produced and shipped by Mathews Archery between September 26, 2008 and June 29, 2009," and "11,263 Mathews Monster bows ... were produced and shipped by Mathews Archery between February 27, 2009 and June 30, 2009." EX2016, ¶¶12, 19. The details present in Mathews Archery's business records is more than sufficient "for a reasonable mind to conclude" that the production model bows manufactured and shipped by Mr. McPherson's companies "... was within the scope of claims ... and would work for its intended purpose." *Nintendo of America Inc. v. iLife Technologies, Inc.*, 717 Fed. Appx. 996 (Fed. Cir. 2017).

B. Production models of both Mathew McPherson's Menace bow and Monster bow were independently reviewed by Bill Krenz, an editor at Inside Archery.

Mathews Archery shipped production models of both the Mission Menace bow and the Mathews Monster bow to *Inside Archery* magazine for review soon after shipments began for each product. EX2006, ¶9, 17; EX2016, ¶¶14-16, 21-23. 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;⁶ EX2015⁷.

In the late 2000's *Inside Archery* magazine was "a leading publisher in the Outdoor Sports Industry ... reaching manufacturers, retailers and others in archery-related organizations" including approximately 12,000 non-paid subscribers in the archery industry." EX2015, ¶¶5-6. Both *Inside Archery* Bow Review articles represent an independent review of a production Mission Menace bow and a production Mathews Monster bow by an industry expert. Consistent with McPherson's testimony, the articles also confirm Mathews as the source of both

⁶ Note that full copies of the *Inside Archery* magazines (December 2008 Issue and June 2009 Issue) are produced as EX2013 and EX2014, and authenticated in EX2017, ¶¶6-8. The Mission Menace Bow Review can be found on pages 42-43 of EX2013, and the Mathews Monster Bow Review article can be found on pages 30-31 of EX2014. However, for convenience, EX2002 and EX2003 containing only the relevant Bow Review articles are referenced throughout. Patent Owner reserves the right to use these references interchangeably.

⁷ EX2015 authenticates these articles and establishes that the publication and retention of EX2002 and EX2003 was performed in the normal course of business for Apollo Creative the publisher of *Inside Archery*.

bows. EX2002, 1; EX2003, 1 (confirming the Monster bow as the “Mathews McPherson Series Monster” and referring to “Matt’s [McPherson] bow designs”).⁸ Furthermore, the articles capture the independent mental impressions of the performance of the Mission Menace bow and the Mathews Monster bow from an industry professional, author Mr. Bill Krenz.⁹ EX2002; EX2003; *Cooper*, 154 F.3d at 1330; *Fleming*, 774 F.3d at 1377.

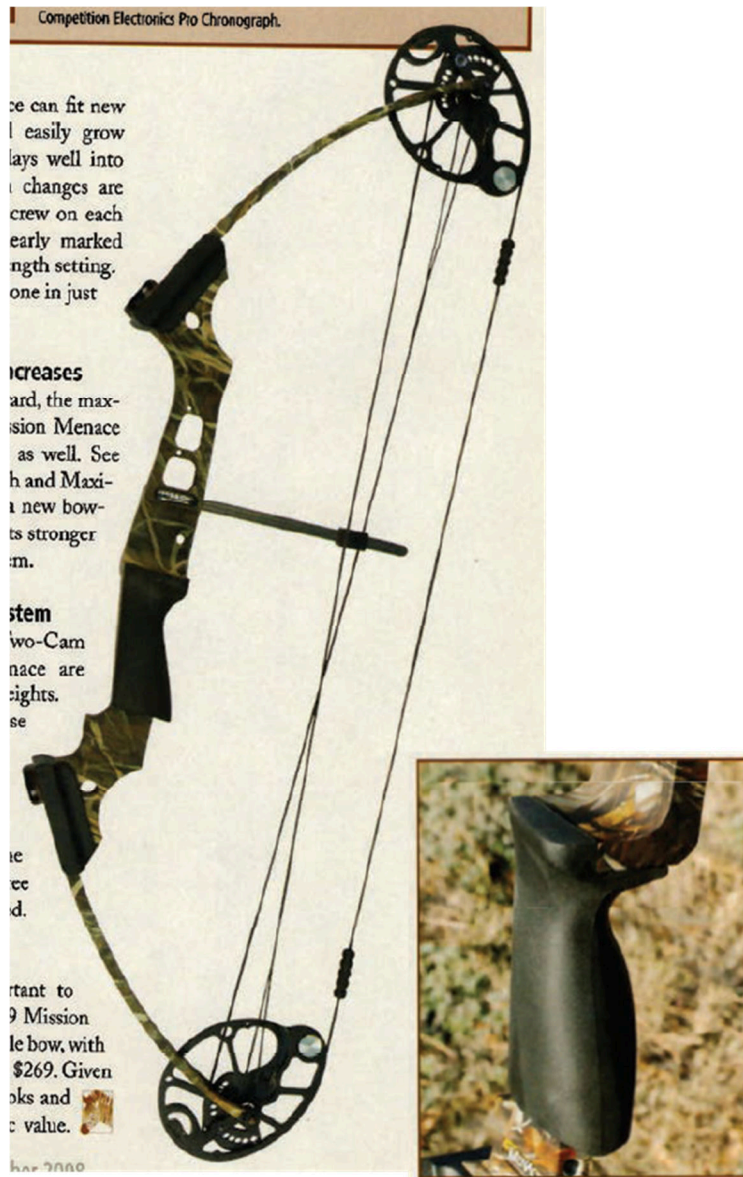
Together these magazine articles provide additional third-party evidence corroborating that the inventions, as recited in the Challenged Claims, were reduced to practice before Darlington’s filing date and that the inventions operated for their intended purposes. Among other things, the design freedom 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, ¶7.

Menace Bow

⁸ EX2002 confirms that the Menace was received from Mission Archery and that Mathews is the parent company of Mission Archery. EX2003 states that the Monster bow was received from Matt McPherson’s company Mathews Inc. which was founded by Matt McPherson.

⁹ Krenz passed away in 2010.

Mathews Archery shipped one of the Mission Menace bows to Bill Krenz at *Inside Archery* magazine for a Bow Report article that would appear in the December 2008 issue. EX2006, ¶9; EX2002, 1; EX2016, ¶¶14-16. Mathews Archery's business records demonstrate that "a camouflage right-handed Mission Menace bow with serial number 935923 ("Menace '923 bow") was shipped to Inside Archery on October 27, 2008." EX2016, ¶14. The photographs in the bow report article (reproduced below) depict a camouflage right handed bow. EX2002, 2 (confirming bow color as "Camo"); EX2016, ¶16. In fact, the Menace '923 bow was one of the first 1,500 Mission Menace bows produced. *Id.*



EX2002.

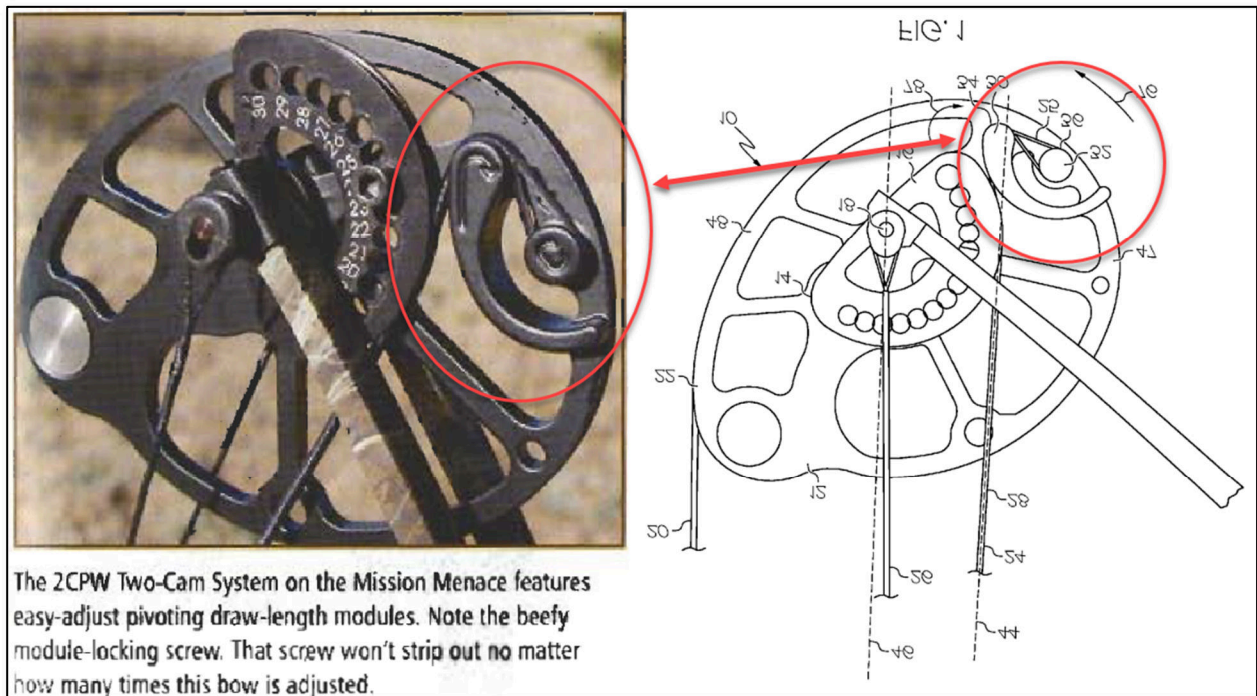
In the article, Krenz had tested the Mission Menace bow and praised its performance, leaving no doubt that the inventions embodied in the bow did indeed work for their intended purposes – to produce a well performing bow. EX2002. “The 2009 Mission Menace is a remarkable bow system that offers new, and particularly young and growing, bowhunters an inviting and versatile bow that can

indeed grow with them from their very first days afield well into their adult bowhunting.” EX2002, 1. The Mission Menace had “an unprecedented 14-inch, youth-to-adult draw-length range.” *Id.*

The Menace article also includes a chart listing arrow speeds for several of the Menace bow’s adjustable draw lengths and draw weights further demonstrating that the bow operated properly. EX2002, Arrow Speed Chart.

As will be shown in the following sub-sections, the cams of the Menace bow that Krenz reviewed are nearly identical to the cams depicted in FIGS. 1-3 of the ’989 Patent; EX2018, ¶¶32-104.¹⁰ FIG. 1 of the ’989 Patent is reproduced below alongside a photo of the Menace bow cam from Krenz’s Bow Report article. The figure is rotated to match the orientation of the cam in the photo. The photo shows that the Menace bow had the same “reverse wrap” power cable configuration as described in the ’989 Patent.

¹⁰ EX2018 Dr. Reinholtz’s second declaration is cited throughout as it includes the testimony from EX2007, Dr. Reinholtz’s first declaration filed pre-institution, along with additional expert testimony.



EX2002, 2;¹¹ EX1001, FIG. 1.

Monster Bow

Mathews Archery also shipped one of the Monster bows to Bill Krenz for a Bow Report article that would appear in the June 2009 issue. EX2006, ¶17; EX2003, 1 (acknowledging Mr. McPherson as the designer); EX2016, ¶¶21-23. Mathews

¹¹ Notably, one can tell that the cam shown in this image is on a strung bow in the brace condition by comparing the orientation of the cam and the tension in the cables with the full bow photograph on the second page of the same article EX2002, 2. EX2018, ¶50; Compare EX2017, App A, Photo 12 (shows a photo of an unstrung bow with loose cables for contrast).

Archery's business records demonstrate that "a Mathews Monster bow with serial number 978783 ("Monster '783 bow") was shipped to Inside Archery on March 23, 2009." EX2016, ¶21. The shipping documents further indicate that the Monster '783 was right-handed and factory set at a 70# draw weight and 29" draw length. *Id.*, App. D. The photographs in the bow report article (reproduced below) depict a handed bow and the article itself confirms the draw length and weight settings. EX2003, 2 (confirming bow color as factory set to 70# draw weight and 29" draw length); EX2016, ¶23. In fact, the Monster '783 bow was one of the first 2,000 Mathews Monster bows produced. *Id.*

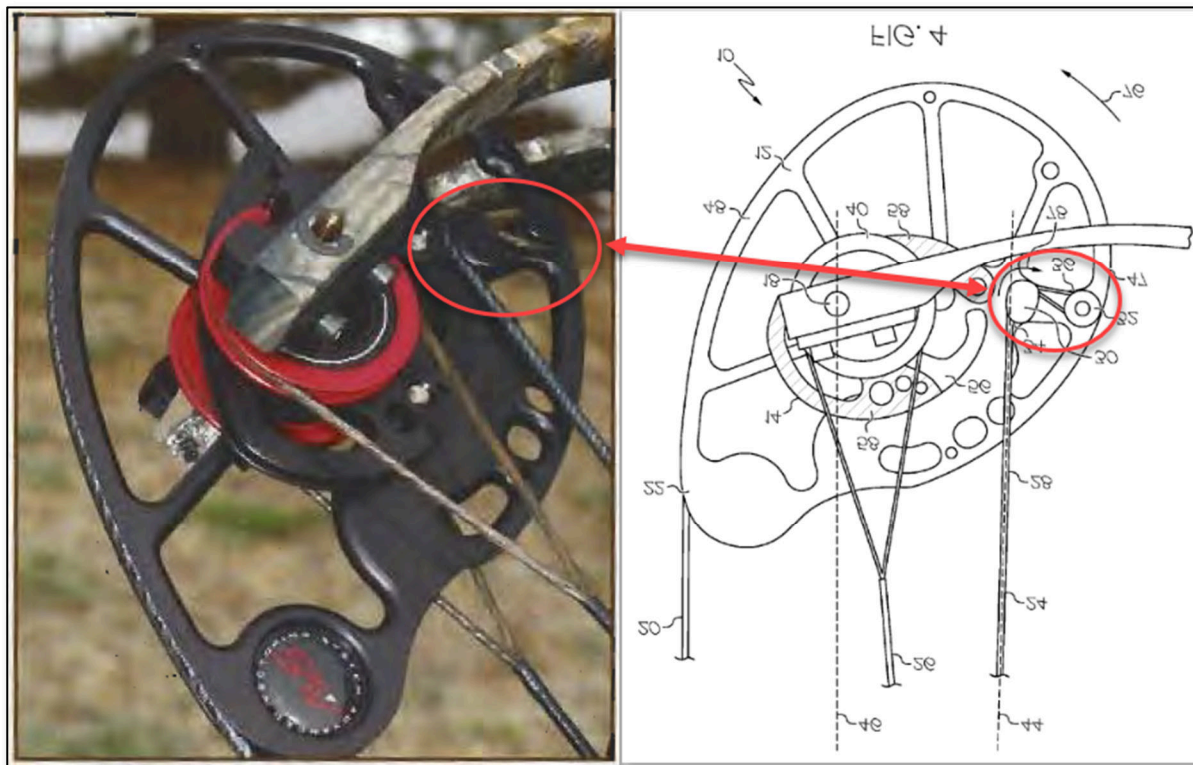


EX2003, 2.

Krenz likewise tested and praises McPherson's Monster bow. EX2003. "The McPherson Series Monster is one of the fastest, most efficient dual-cam compound bows ever produced." EX2003, 1. Krenz continues: "At the shot, the Mathews Monster is surprisingly quiet and shock-free." *Id.* "Arrow speed with the Mathews Monster is simply astonishing. Just a few years ago archery engineers would have told you that it wasn't possible to build a bow this fast while being this shootable." EX2003, 1-2. Krenz's praise confirms that the Monster, like the Menace, worked

for its intended purpose – it was a well performing bow. EX2003 (“one of the fastest, most efficient dual-cam compound bows ever produced.”); *see also* EX2003, Arrow Speed Chart.

As will be shown in the following sub-sections, the cams of the Monster bow that Krenz reviewed are nearly identical to the cams depicted in FIGS. 4-6 of the '989 Patent. EX2018, ¶¶34-104. FIG. 4 of the '989 Patent is reproduced below alongside a photo of the Monster bow cam from Krenz's Bow Report article. The figure is rotated to match the orientation of the cam in the photo. The photo shows that the Monster bow had the same “reverse wrap” power cable configuration as described in the '989 Patent.

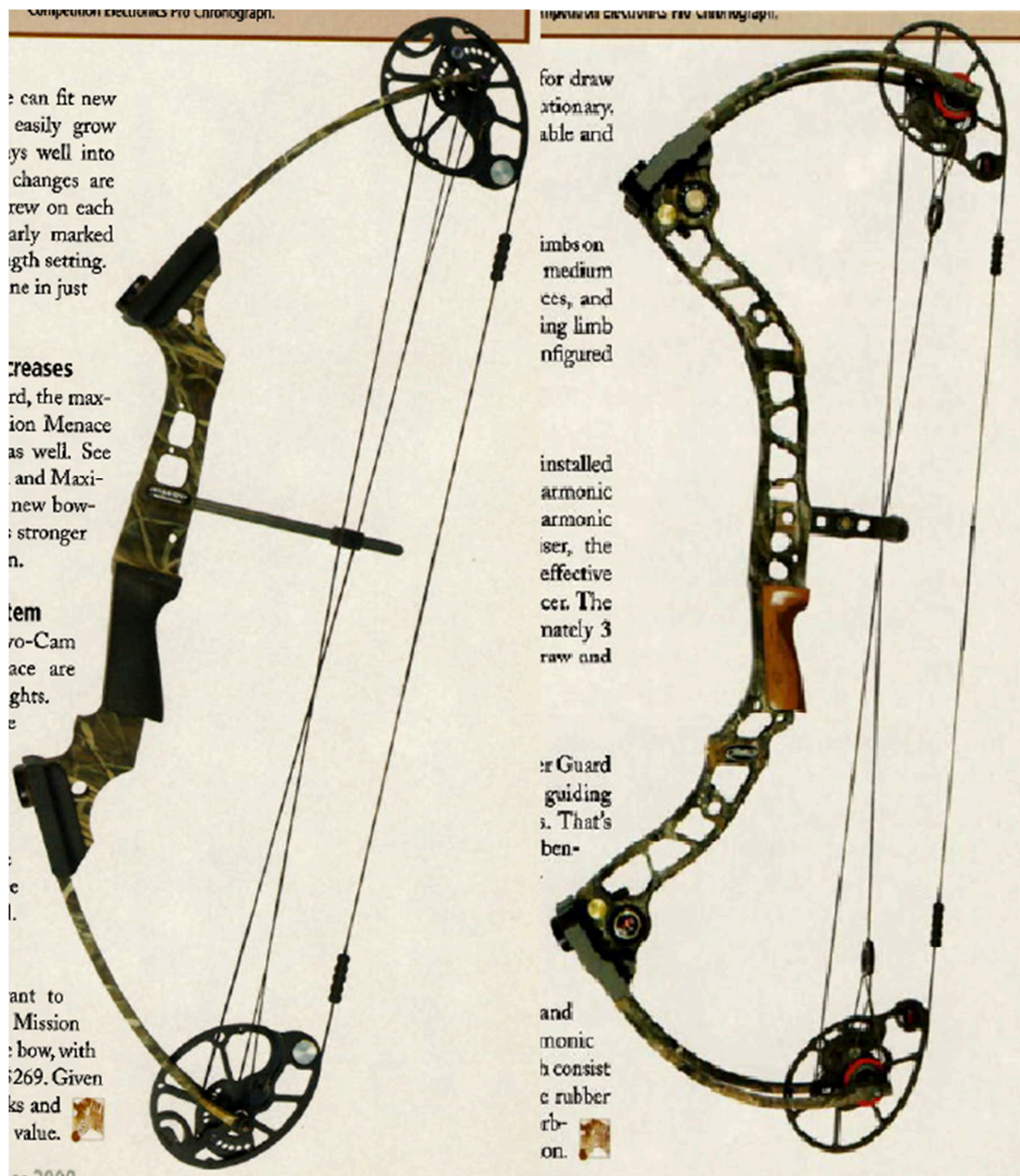


EX2003, 1; EX1001, FIG. 4.

C. The Menace bow embodies all the limitations of claims 1, 3-4, 8-14, and 16-19 of the '989 patent.

The Menace article and the photographs and video of the production Menace '817 and Menace '455 bows fully corroborate the testimony that McPherson's Mission Menace bow was reduced to practice and worked for its intended purposes prior to Darlington's filing date. The following discussion demonstrates that the Mission Menace bow embodied all the limitations of each of claims 1, 3-4, 8-14, and 16-19. EX2018, ¶¶38-49, 61-63; *Cooper*, 154 F.3d at 1327; *In re Asahi/America Inc.*, 68 F.3d at 445.

The *Inside Archery* articles include photographs of each full-bow in the brace condition and close up photos of the respective cams in the brace condition, but do not include photographs of the bows or cams in the drawn condition. EX2002; EX2003; EX2018, ¶¶33-37. However, because the cams of the Menace and Monster bows had substantially the same geometry as those depicted in the '989 patent figures, their rotation in the drawn position would have been readily understood by a POSITA. EX2018, ¶¶66-71; EX2016, ¶26. This fact is confirmed by the photographs and videos of the production Menace and Monster bows submitted with EX2017 and which are discussed in detail below and in Dr. Reinholtz's declaration (EX20018).



EX2002; EX2003.

In a side-by-side comparison the cams of the production Menace '455 bow and the Monster '755 bow are substantially the same as those depicted in the respective Inside Archery articles. EX2018, ¶¶50, 59. Furthermore, the videos of the Menace '455 bow, the Menace '817 bow, and the Monster '775 bow being drawn from brace confirm the geometry of the cams during draw and the rotation direction of the cams, leaving no doubt about the operation of the Menace and Monster bows generally and, in particular, those depicted in the Magazine articles.¹² EX2018, ¶¶66-71, 98-100.

¹² See video files **Menace 455 Full Bow.mp4**, **Menace 455 Lower Cam.mp4**, **Menace 817 Full Bow.mp4**, **Menace 817 Upper Cam.mp4**, and **Monster Bow.mp4** each described in and submitted with EX2017.

Specifications
2009 Mission Menace

Stable-to-Arrow Length	31 inches
Base Height	7.25 inches
Base Geometry	1 inches reflex
Mass Weight	2.9 pounds
Stiff	70 percent
Draw Lengths	17 to 30 inches
Draw Weights	16-52 pounds
Cam	Realtree Tree Advantage Max 4 HD

For more information, Circle #220, log onto www.hunter.com or call (800) 269-2779.

Draw Length & Maximum Draw Weight
2009 Mission Menace

Draw Length	Maximum Draw Weight
17 inches	25.6 pounds
18 inches	30.2 pounds
20 inches	38.1 pounds
21 inches	40.9 pounds
22 inches	43.5 pounds
23 inches	46.0 pounds
24 inches	47.2 pounds
25 inches	48.5 pounds
26 inches	49.4 pounds
27 inches	50.3 pounds
28 inches	51.0 pounds
29 inches	51.6 pounds
30 inches	52.4 pounds

Sample bow weighed with digital draw-weight scale.

Arrow Speed
2009 Mission Menace

Draw Length	Draw Weight	Arrow	Arrow Weight	Arrow Speed
20 inches	38 pounds	19" 1816 Aluminum		
		21" 1816 Aluminum		
25 inches	48 pounds			
30 inches	52 pounds			

Incremental Draw-Weight System
As draw length is adjusted, the maximum draw weight is automatically increased by the 2CP Two-Cam System of the Mission Menace. When the bow is shot, the weights rotate backward, effectively canceling out shock and noise. The result is one of the quietest and most shock-free new bowhunter bows ever offered.

Perimeter-Weighted Cam System
Integrated in the 2CP Two-Cam System of the Mission Menace are strategically-placed perimeter weights. When the bow is shot, the weights rotate backward, effectively canceling out shock and noise. The result is one of the quietest and most shock-free new bowhunter bows ever offered.

Surprisingly Affordable
Economy and value are important to bowhunters. The 2009 Mission Menace is a great example of a bow that is both affordable and high performing.

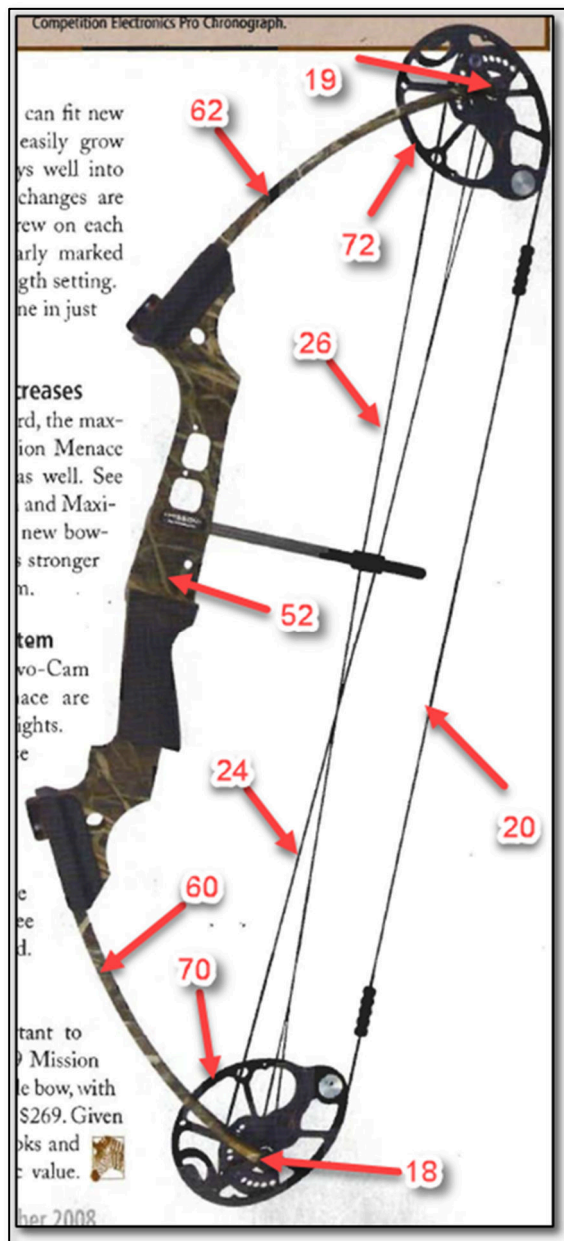
Key Features and Benefits
Light and Compact
A light and compact bow can be a big plus to a new bowhunter. The 2009 Mission Menace weighs a mere 2.9 pounds and measures just 31 inches long.

EX2018, ¶50.



EX2018, ¶59.

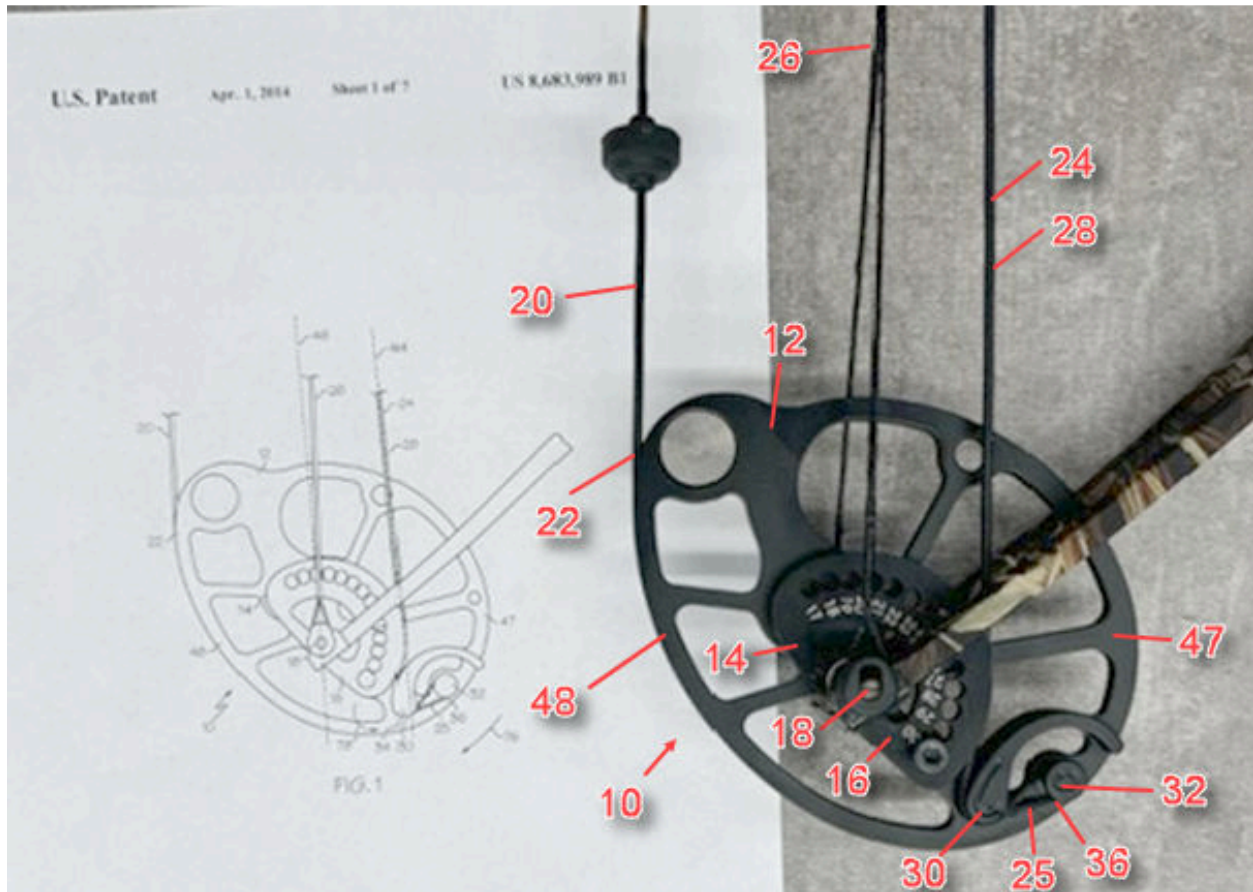
The following figures illustrate the all the components of the Menace bow in side-by-side full-bow photographs labeled with the same element numbers as in the figures of the '989 patent. The Menace bow clearly has a riser (52) supporting two limbs (60, 62), cams (rotatable members 72, 70) attached to the limbs by axels (19, 18), a drawstring (20) extending between the cams, and power cables (24, 26) extending between the cams.



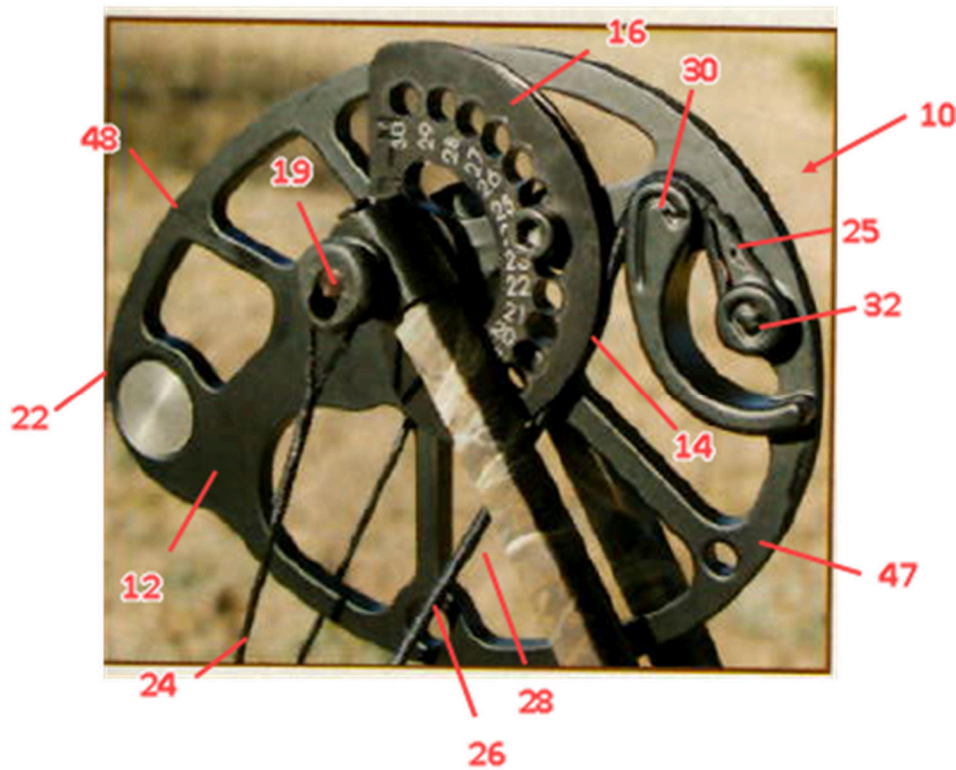
EX2002, 2 (annotated); EX2017, App. A, Photo 2 (annotated).

The Menace bow's cam (10) clearly has a body (12) with two parts (47, 48) on either side of the axel (18, 19) in the brace condition, a cam module (16) with a cam track (14), a capstan (30), a terminal (32), a loop (25) at the end of the

elongate straight portion (28) of each power cable (24, 26) wrapped around the terminal (32), and the drawstring (20) exits at an exit location (22). These parts are clearly similar and visible on the photos of the cam from EX2017 and EX2002. EX2018, ¶¶50-51.



EX2017, App. A, Photo 6 (lower cam annotated).



EX2002, 2 (upper cam annotated).

1. Claim 1

Claim 1(Pre): “An archery bow having a brace condition and a drawn condition, the archery bow comprising:”

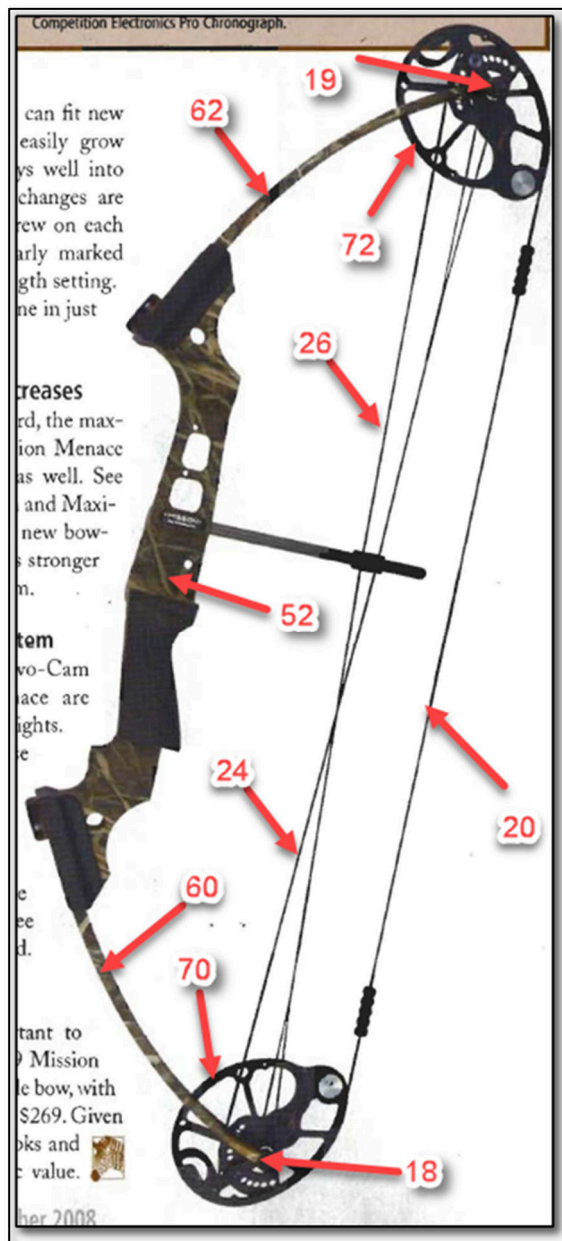
Claim 1(a): “a riser; a first limb and second limb supported by the riser;”

Claim 1(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,”

Claim 1(c): “a drawstring extending between the first rotatable member and the second rotatable member;”

The Menace article includes a photograph of the full Mission Menace bow in a brace condition with a riser (52) supporting both a first (60) and a second limb

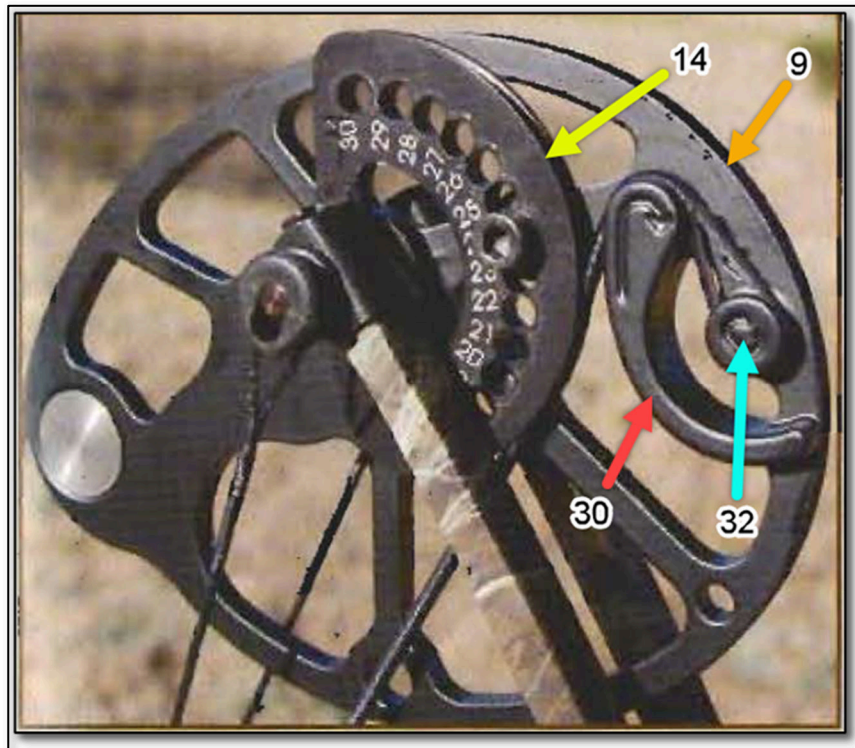
(62). EX2002, 2; [EX2018, ¶63, confirming brace condition]. Each limb supports a rotating cam (70, 72) on a respective axle (18, 19), with a drawstring (20) extending between the two cams. *Id.* The same features are also depicted in the photographs of the Menace '455 and Menace '817 bows. See EX2017, App. A, B; EX2018, ¶¶33-51, 61-63.



EX2002, 2 (annotated); EX2017, App. A, Photo 2 (annotated).

Claim 1(b)(ii)-(v): “the first rotatable member comprising a drawstring track, a cam track, a capstan and a terminal, 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,”

The Menace article includes a closeup photograph of one of the Mission Menace bow's cams (reproduced and annotated below). The drawstring track (9), cam track (14), capstan (30), and terminal (32) are each clearly visible in the photograph. The photograph further shows that the cam track offset in a separate plane from the drawstring track. EX2018, ¶¶64. The same features are also depicted in the photographs of the Menace '455 and Menace '817 bows. See EX2017, App. A, B; EX2018, ¶¶33-51.



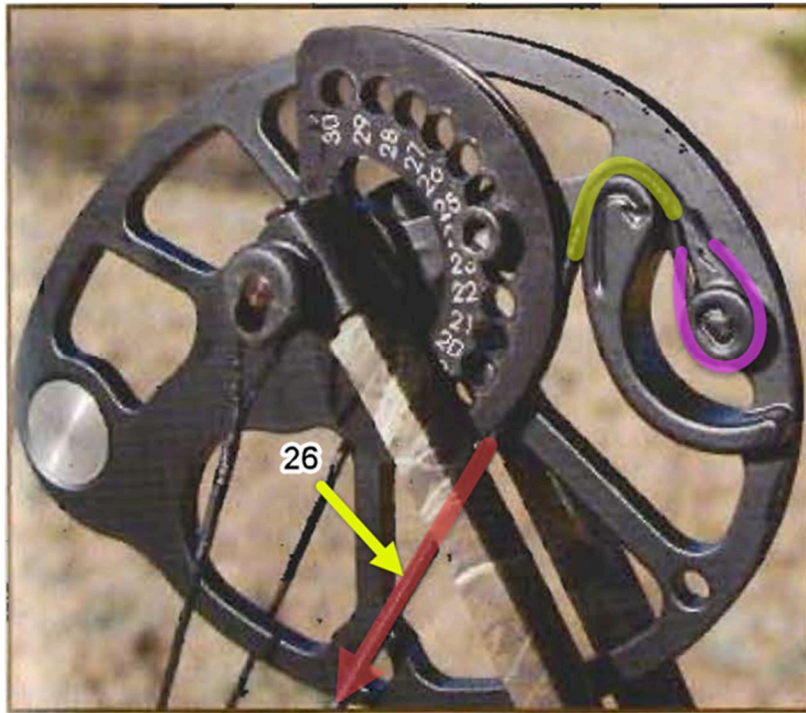
EX2002, 2 (upper cam annotated).

Claim 1(d)(i)-(ii): “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;”

The cam photograph from the Menace article is annotated below to highlight claim limitation 1(d)(i)-(ii). The Mission Menace bow had a power cable (26). The power cable had a straight portion (red portion) extending from one cam towards the other cam. A portion of the Mission Menace bow's power cable wrapped around the capstan (yellow portion) and a portion that loops around the terminal (purple portion). The photograph clearly shows the elongate straight portion (red) running alongside (i.e., near) the rotatable cam. EX2018, ¶65.

Moreover, it is clear that the cam in this photograph “shows a strung bow in the brace condition as also depicted in the full bow photograph in the article” for multiple reasons. EX2018, ¶50. The cam orientation is identical to that shown in the full-bow photograph from the article and the power cables are tight and under tension. *Id.* This is clearly seen when contrasted with Photo 12 of the Menace '455 in an unstrung condition. *Id.*

The same features are also depicted in the photographs of the Menace '455 and Menace '817 bows. See EX2017, App. A, B; EX2018, ¶¶33-51.



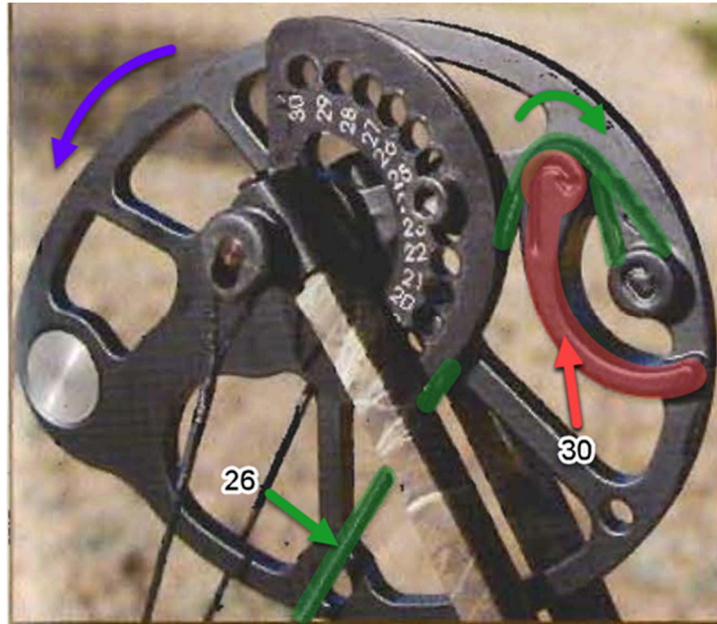
EX2002, 2 (annotated).

Claim 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”

Claim 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”

The cam photograph from the Menace article is annotated below to highlight claim limitations 1(e) and 1(f). As shown, the Mission Menace bow power cable (26) wrapped from left to right around the capstan (30), as shown by the green arrow, while the cam rotated in the opposite direction, indicated by the purple arrow, when the bow is drawn from the brace condition. EX2018, ¶66; see also EX2017, video files **Menace 455 Full Bow.mp4**, **Menace 455 Lower Cam.mp4**, **Menace 817 Full**

Bow.mp4, and **Menace 817 Upper Cam.mp4**. The same features are also depicted in the photographs of the Menace '455 and Menace '817 bows. See EX2017, App. A, B; EX2018, ¶¶33-51.

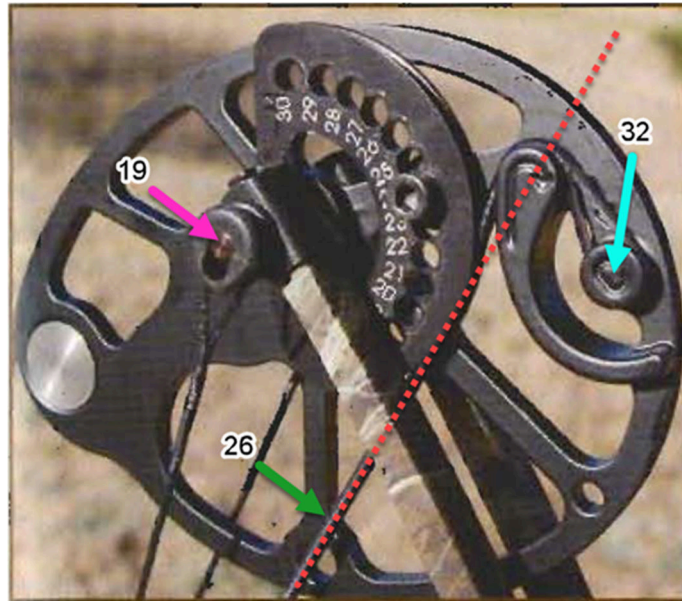


EX2002, 2 (annotated).

Claim 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.”

The cam photograph from the Menace article is annotated below to highlight claim limitation 1(g). The photograph of the Mission Menace bow shows the cam in the brace condition and has been annotated with a dashed line approximating the plane formed by the straight portion of the power cable (26). EX2018, ¶67 (confirming the cam is in the brace condition). The axle (19) and the terminal (32)

are on opposite sides of the plane formed by the straight portion of the power cable (26).



EX2002, 2 (annotated).

The same features are also depicted in the photographs of the Menace '455 and Menace '817 bows. See EX2017, App. A, B; EX2018, ¶¶33-51.

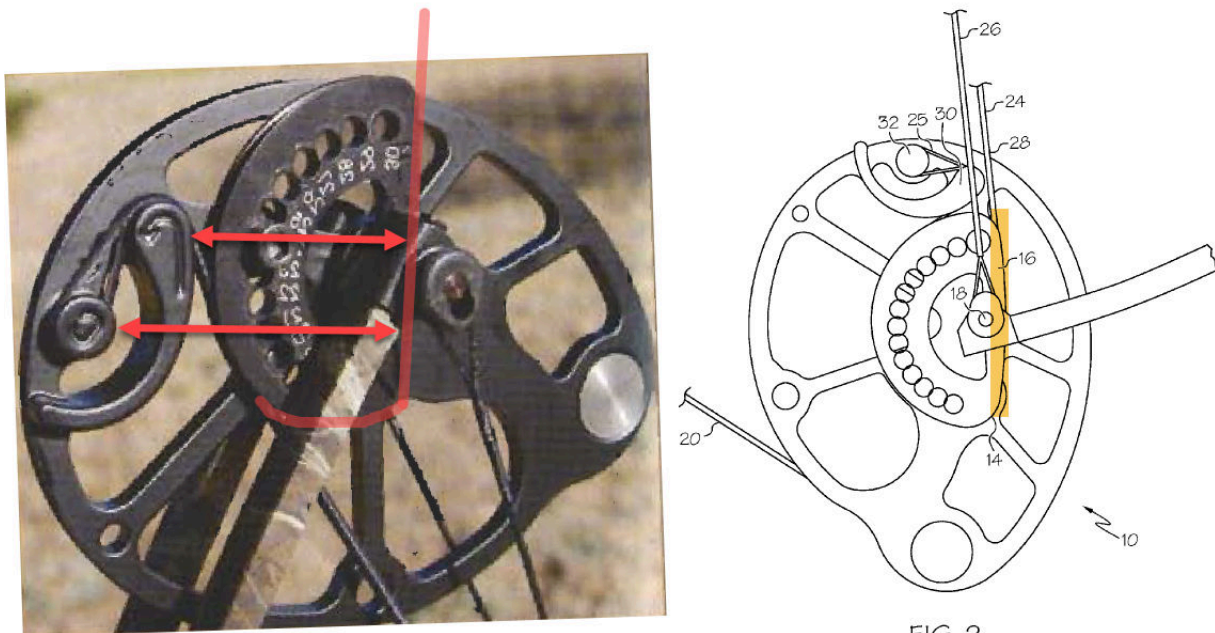
2. Claim 11

Independent claim 11 is similar to claim 1 except for the following limitation:

Claim 11(g): “wherein, in the drawn condition, the capstan is located closer to the elongate straight portion [of the power cable] than the terminal.”

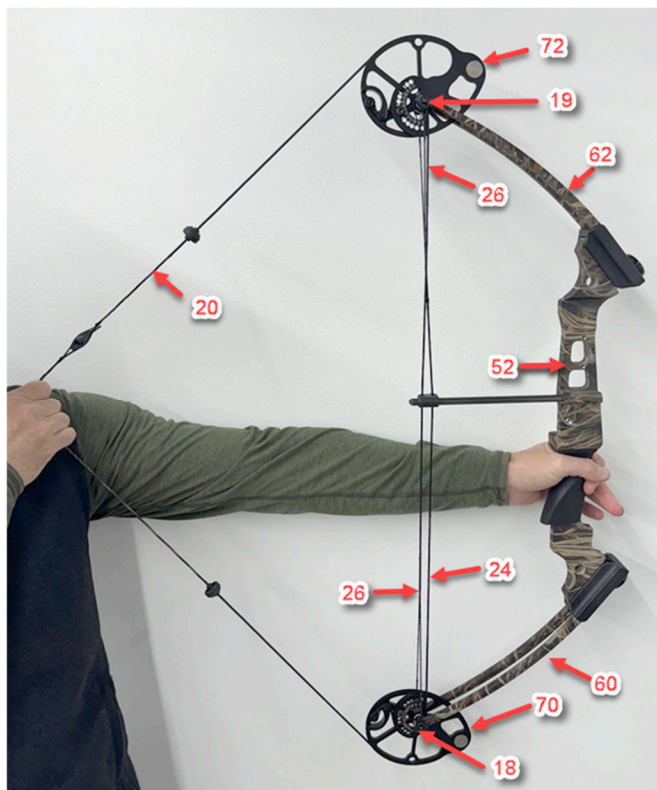
The Menace article does not show the cams of the Mission Menace bow in the drawn orientation. But on the Mission Menace cams the capstan was closer to the straight portion of the power cable than the terminal when the bow is drawn. The

draw only rotates the cam, but the relative position of components on the cam remain the same. EX2018, ¶¶68-69. This fact is shown by the annotated figures below. As noted above, the Mission Menace cams were nearly identical to the cams depicted in FIGS 1-3 of the '989 Patent. EX2018, ¶¶33-51. FIG. 2 from the '989 Patent depicting a cam in the drawn position (EX1001, col. 5:8) is shown alongside a rotated version of the Mission Menace cam. When the bow is drawn the power cable rests in the flat portion of the cam module, shown in orange in FIG. 2 of the '989 Patent. The Mission Menace had the same shape cam module, and when drawn the power cable would rest in the same flat portion, as shown in annotated red lines. The terminal is further from this straight portion of the power cable than the capstan, similar to that depicted in FIG. 2 of the '989 Patent.

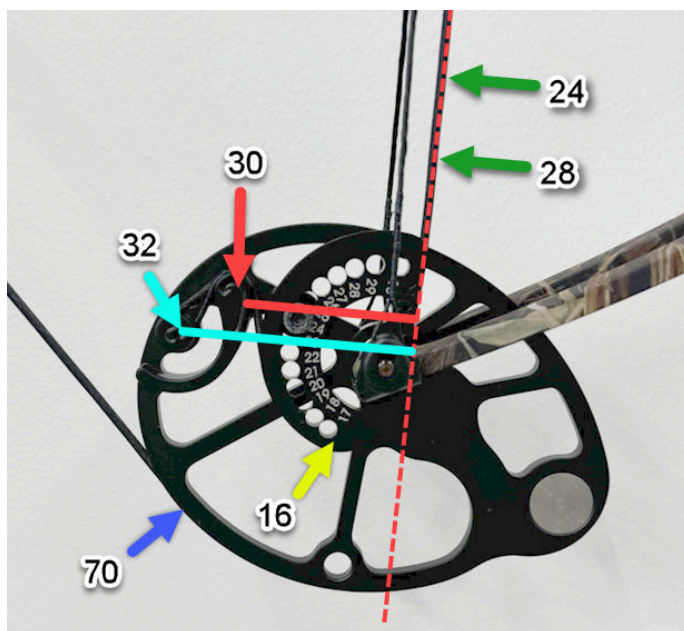


EX2002, 2 (annotated); EX1001, FIG. 2 (annotated).

In addition, although it is evident to one with familiarity of compound bows how the cams would look in the drawn orientation, the Menace article does not show the cams in the drawn orientation. EX2018, ¶¶68-69 (describing how this claim limitation practiced by the Menace bow based on the photographs in the Menace Article). The photographs below of the Menace '455 bow show the full bow in the drawn condition and a close up view of the lower cam (70) in the drawn condition. The capstan (30) in both photographs is located closer to the elongate straight portion (28) of the power cable (24) than the terminal (32). The photographs in EX2017 and related videos confirm Dr. Reinholtz's observation of cam rotation from the Menace Article (EX2002) and his conclusion that the Menace bow practiced this claim limitation. EX2018, ¶¶68-71.



EX2017, App. A, Photo 8 (annotated)



EX2017, App. A, Photo 10 (annotated).

3. Claim 12

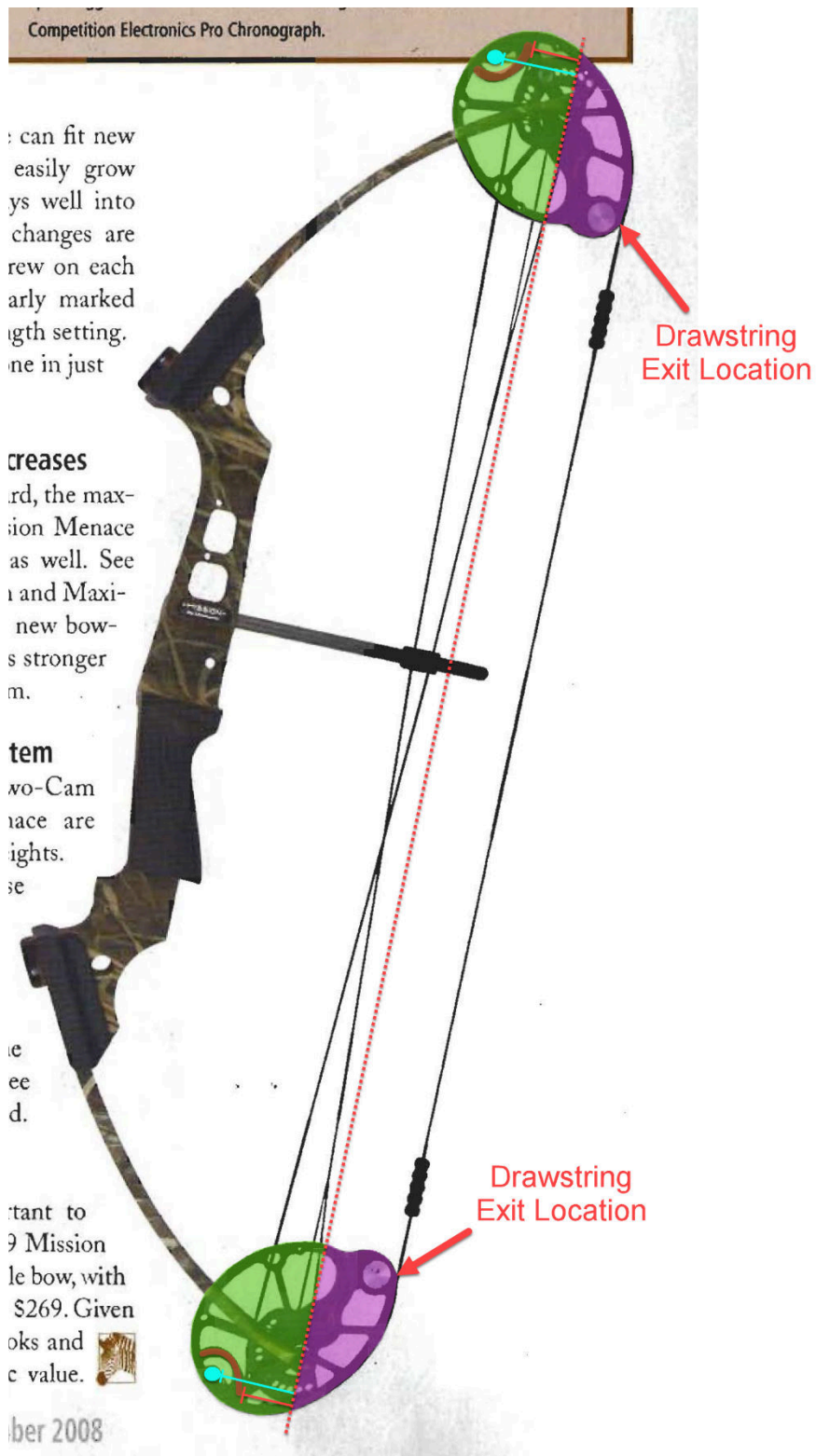
Independent claim 12 is similar to claim 1 except for the following limitations:

Claim 12(b)(i)-(ii): “... 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, the first axle and the second axle defining an axle plane,”

Claim 12(c)(i)-(ii): “a drawstring extending between the first rotatable member and the second rotatable member, the drawstring extending from the first rotatable member at an exit location;”

Claim 12(e)(i): “wherein, in the brace condition, the axle plane divides the first rotatable member to a first part and a second part, the capstan and the terminal located in the first part, the drawstring exit location located in the second part, and”

See supra, claim 1(c). In addition, the full bow photographs of the Menace article and the Menace '817 are annotated below with a dashed red line showing the axle plane defined by the two axles (18, 19) and to show the drawstring exit location (22) on each cam. The axle plane of the Mission Menace bow divides each cam into a first part (green) and a second part (purple). The capstan and terminal (circled) were located in the green first part, and the drawstring exit (22) was located on the purple second part. EX2018, ¶¶71-73.



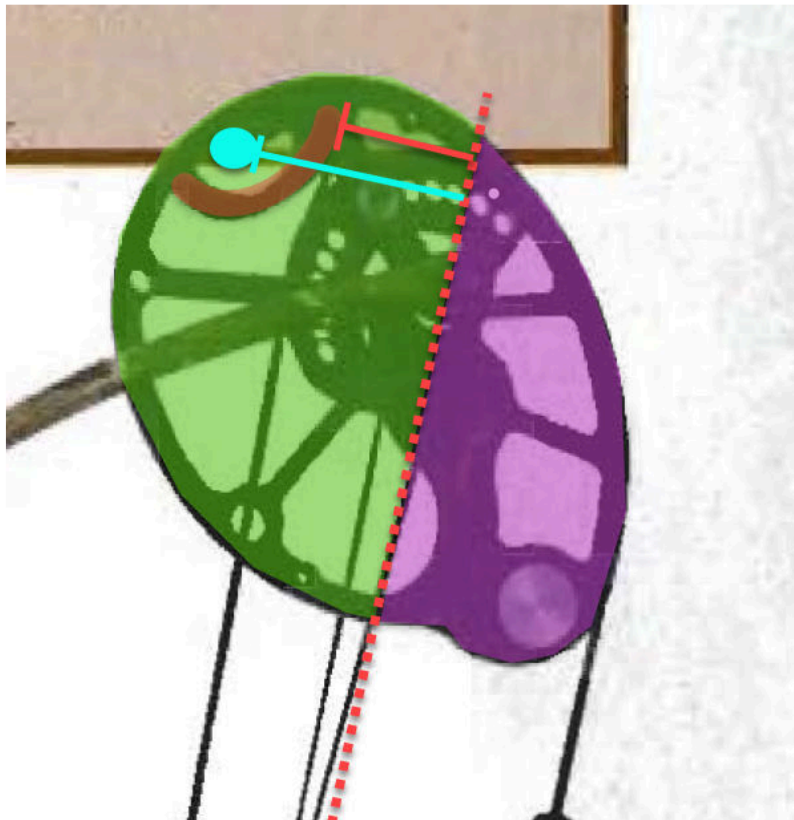
EX2002, 2 (annotated).



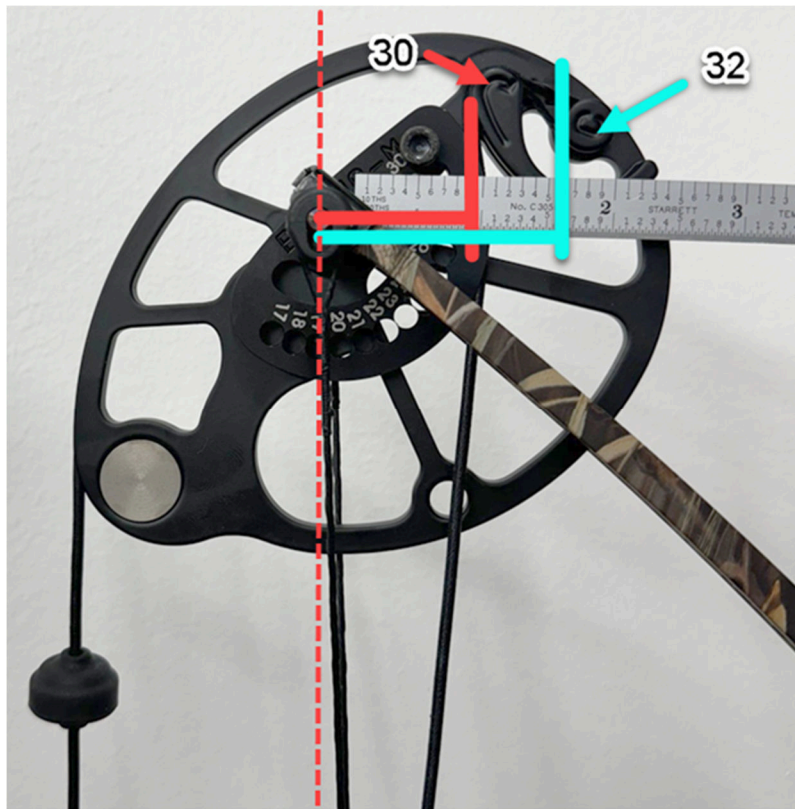
EX2017, App. B, Photo 2 (annotated).

Claim 12(e)(ii): “a distance between the terminal and the axle plane is greater than a distance between the capstan and the axle plane, and”

See infra, claim 3. A close in view of the upper cam from the full bow photographs from the Menace article and the Menace '817 bow are annotated below illustrating the relative distances between the axle plane (dashed red line) of the Mission Menace bow and the terminal (blue) and the capstan (red). The distance between the terminal and the axle plane was greater than the distance between the capstan and the axle plane. EX2018, ¶74.



EX2002, 2 (annotated).



EX2017, App. B, Photo 4 (annotated).

4. Claim 19

Independent claim 19 is similar to claim 1 except for the following limitation:

Claim 19(b(i)-(ii): “... 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, the first axle and the second axle defining an axle plane,”

See supra, claim 12(b)(i)-(ii).

Claim 19(c): “a drawstring extending between the first rotatable member and the second rotatable member, the drawstring extending from the first rotatable member at an exit location;”

See supra, claim 12(c)(i)-(ii).

Claim 19(e): “wherein, in the brace condition, the axle plane divides the first rotatable member to a first part and a second part, the capstan and the terminal located in the first part, the drawstring exit location located in the second part, and a distance between the terminal and the axle plane is greater than a distance between the capstan and the axle plane, and”

See supra, claim 12(e)(i)-(ii).

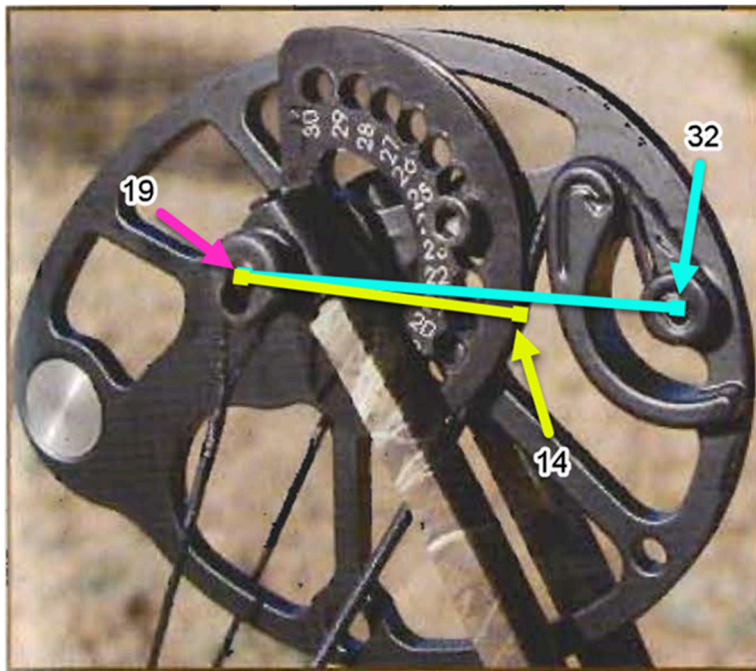
Claim 19(f)(i)-(ii): “wherein, in the drawn condition, said power cable comprises an elongate straight portion located near said first rotatable member, the capstan located closer to the elongate straight portion than the terminal.”

See supra, claim 11(g).

5. Claims 3 & 14

Claim 3: “The archery bow of claim 1[14], wherein a distance between the first axle and the terminal is greater than a distance between the first axle and the cam track.”

The cam photograph from the Menace article is annotated below to highlight the limitations of claims 3 and 14. On the Mission Menace bow the distance (blue) between the terminal (32) and the axle (19) was greater than the distance (yellow) between the cam track (14) and the axle (19). EX2018, ¶76.



EX2002, 2 (annotated).

6. Claims 4 & 16

Claim 4: “The archery bow of claim 1, wherein at least a portion of said cam track comprises a module that is attached to said first rotatable member.”

Claim 16: “The archery bow of claim 12, wherein at least a portion of said cam track comprises a module that is attached to said first rotatable member, the module being removable or repositionable.”

The Mission Menace bow included an adjustable/rotatable cam module for changing draw-length. EX2002, 2 (“Draw-length changes are a snap. Remove one locking crew on each cam and simply pivot the clearly marked modules to the desired draw-length setting.”).



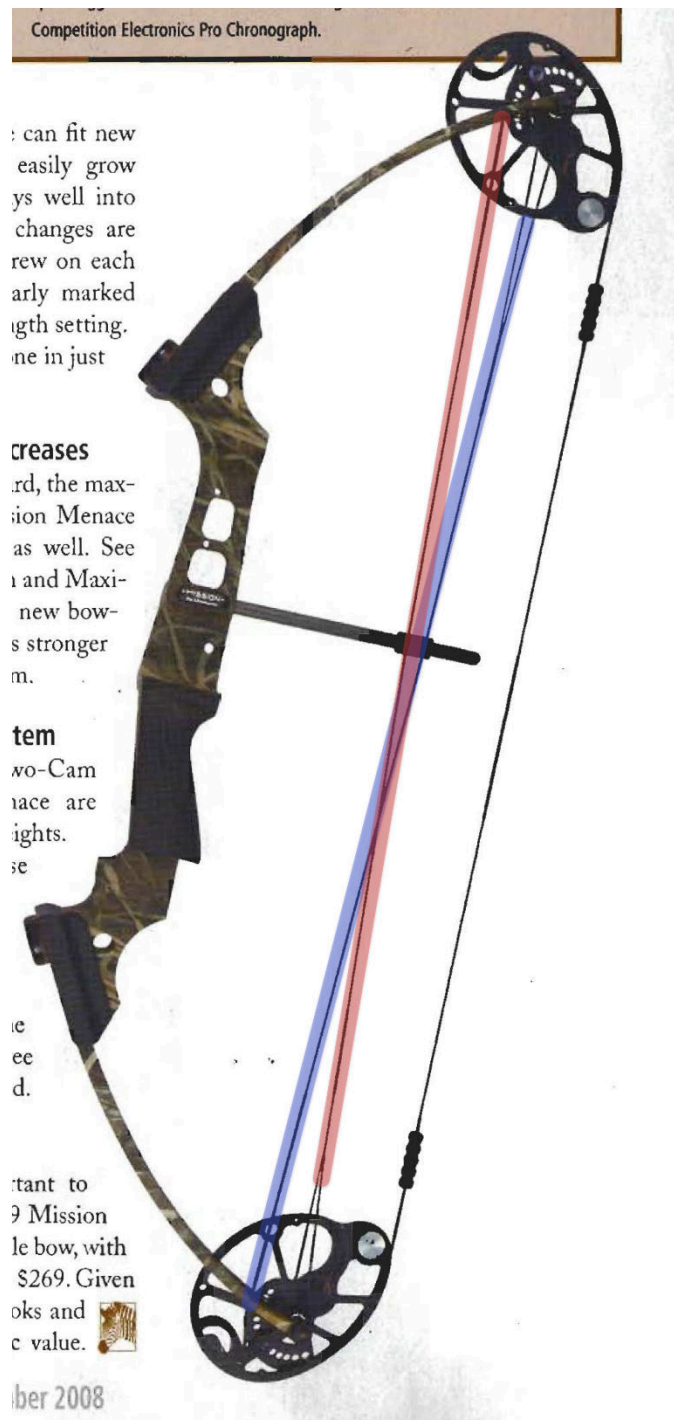
The 2CPW Two-Cam System on the Mission Menace features easy-adjust pivoting draw-length modules. Note the beefy module-locking screw. That screw won't strip out no matter how many times this bow is adjusted.

EX2002, 2 (annotated).

7. Claim 8

Claim 8(a)-(c): “The archery bow of claim 1, further comprising a second power cable, said second rotatable member comprising a second cam track, a second capstan and a second terminal, the second power cable attached to said second terminal and extending toward the first limb, said second power cable comprising a second elongate straight portion located near said second rotatable member, a second capstan portion in contact with said second capstan and a second terminal portion in contact with said second terminal;”

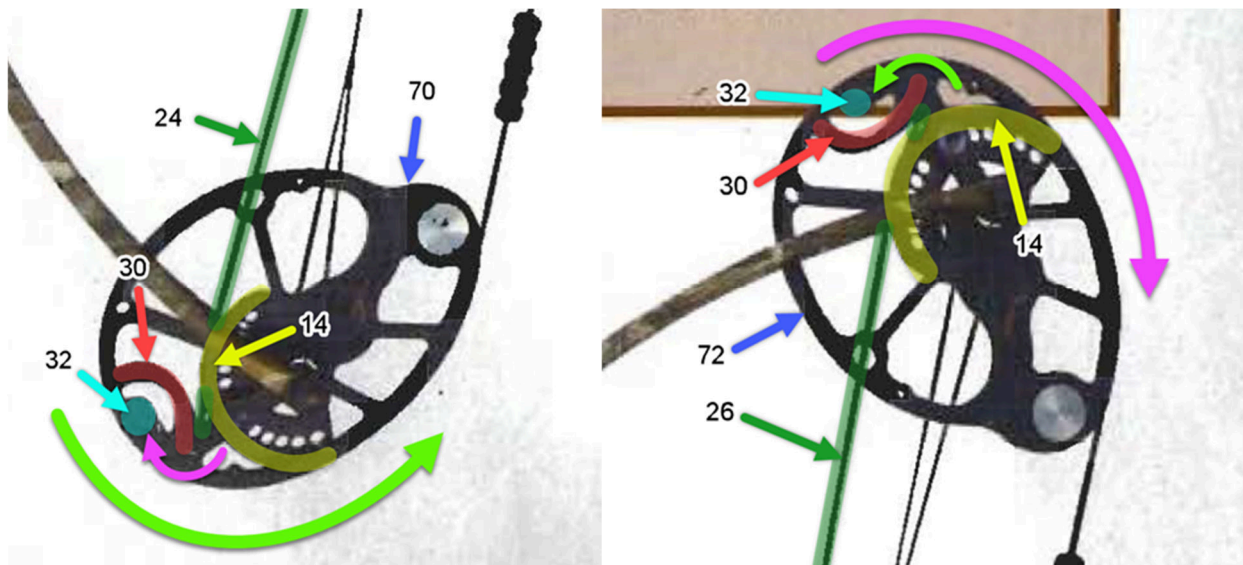
The Mission Menace bow included two operating cams. EX2002, 2 (“The 2CPW Two-Cam System on the Mission Menace features easy-adjust pivoting draw-length modules.”). The full bow photograph from the Menace article is annotated below to highlight the first and second power cables.



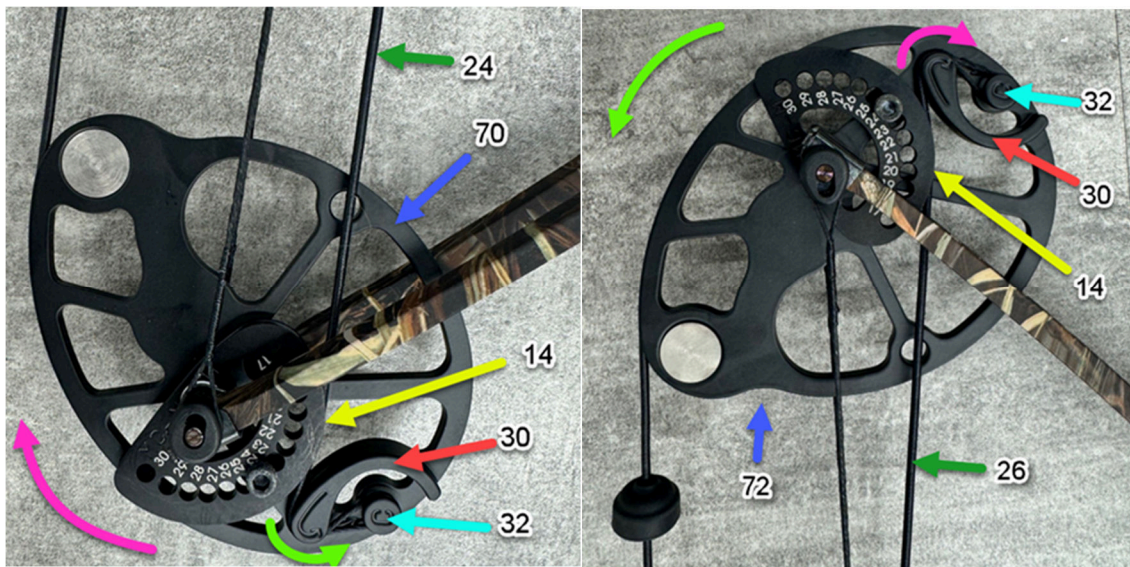
EX2002, 2 (annotated).

The upper and lower cams of the of the full bow photograph from the
Menace article are enlarged and annotated below; and the upper and lower cam

photographs of the Menace '455 bow are annotated below to show the components of each cam. Both cams of the Mission Menace bow had a cam track (14), a capstan (30), and a terminal (32). On both cams a respective power cable (24, 26) was attached to the terminal (32) and had an elongate straight portion that extends towards the opposite limb. A portion of each power cable (24, 26) wrapped around the capstan (30) and a portion looped around the terminal (32). The green arrows in the photographs indicate a first rotational direction, and the purple arrows indicate a second rotational direction opposite the first rotational direction.



EX2002, 43 (annotated).



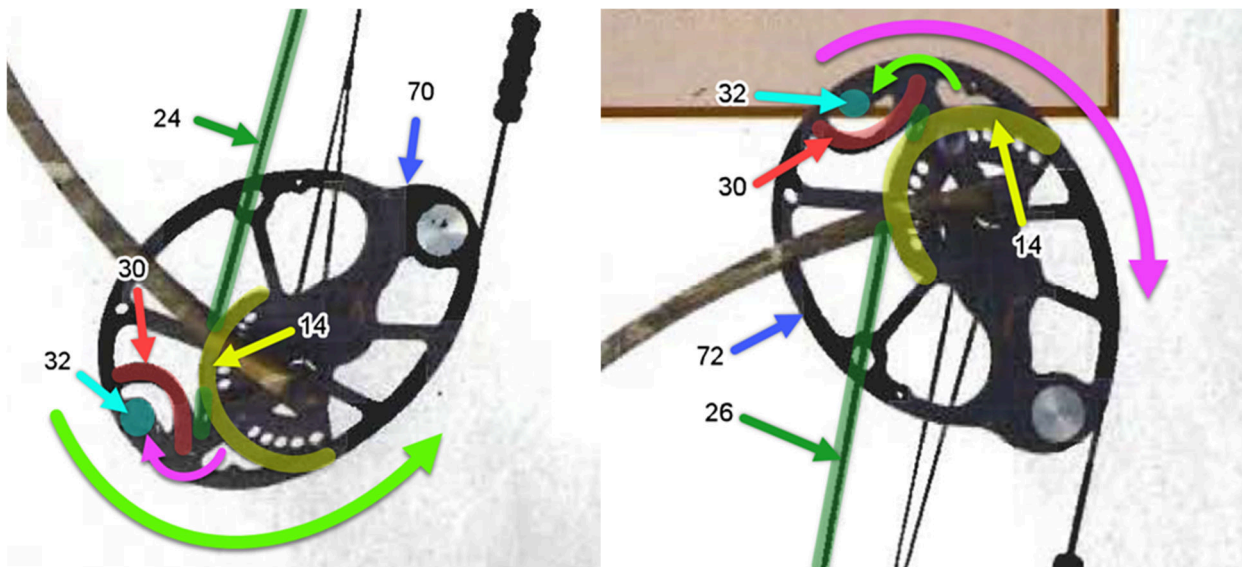
EX2017, App. A, Photos 4 and 5 (annotated).

Claim 8(d): “wherein, in the brace condition, the second power cable wraps around the second capstan in the second rotational direction as the second power cable is traversed from the second elongate straight portion to the second terminal portion; and”

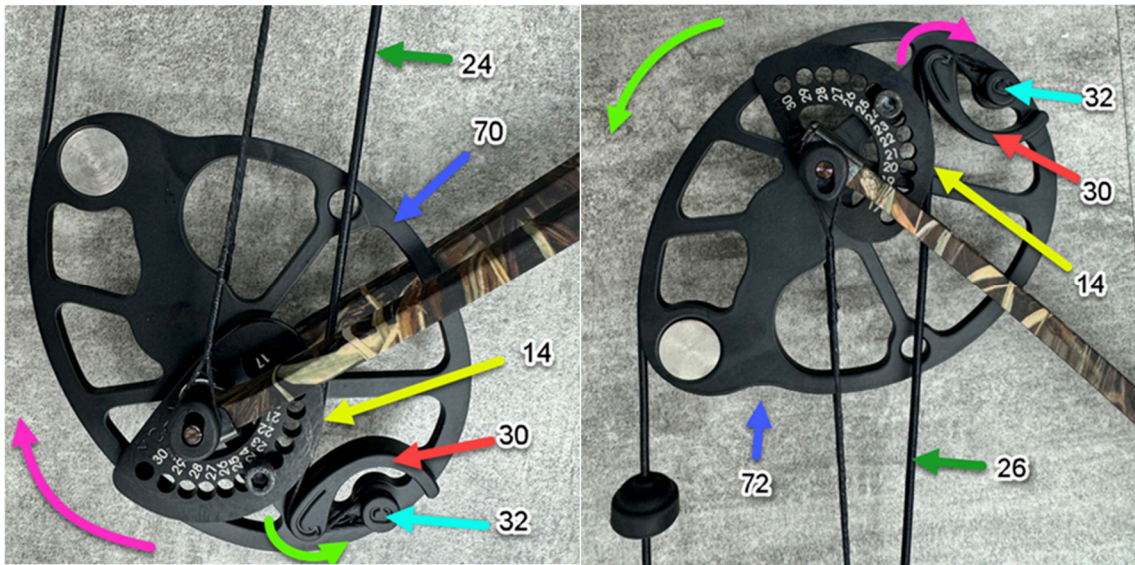
Claim 8(e): “when the bow is drawn from the brace condition, the second rotatable member rotates in the first rotational direction.”

On the Mission Menace bow the power cables on each cam wrapped around the respective capstan in an opposite direction to the rotational direction of the cam when the bow was drawn. The upper and lower cams of the of the full bow photograph from the Menace article are enlarged and annotated below; and the upper and lower ca photographs of the Menace '455 bow are annotated below to illustrate the respective power cable wrap directions and cam rotation directions. The lower cam (70) rotates, when drawn, in a first rotational direction (green) and its power cable (24) wraps in a second rotational direction (purple). The upper cam (72)

rotates, when drawn, in the second rotational direction (purple) and its power cable (26) wraps in the first rotational direction (green). The rotation of the Menace '455 cams when drawn from brace is further illustrated in EX2017, **Menace 455 Full Bow.mp4**, **Menace 455 Lower Cam.mp4**.



EX2002, 2 (annotated).

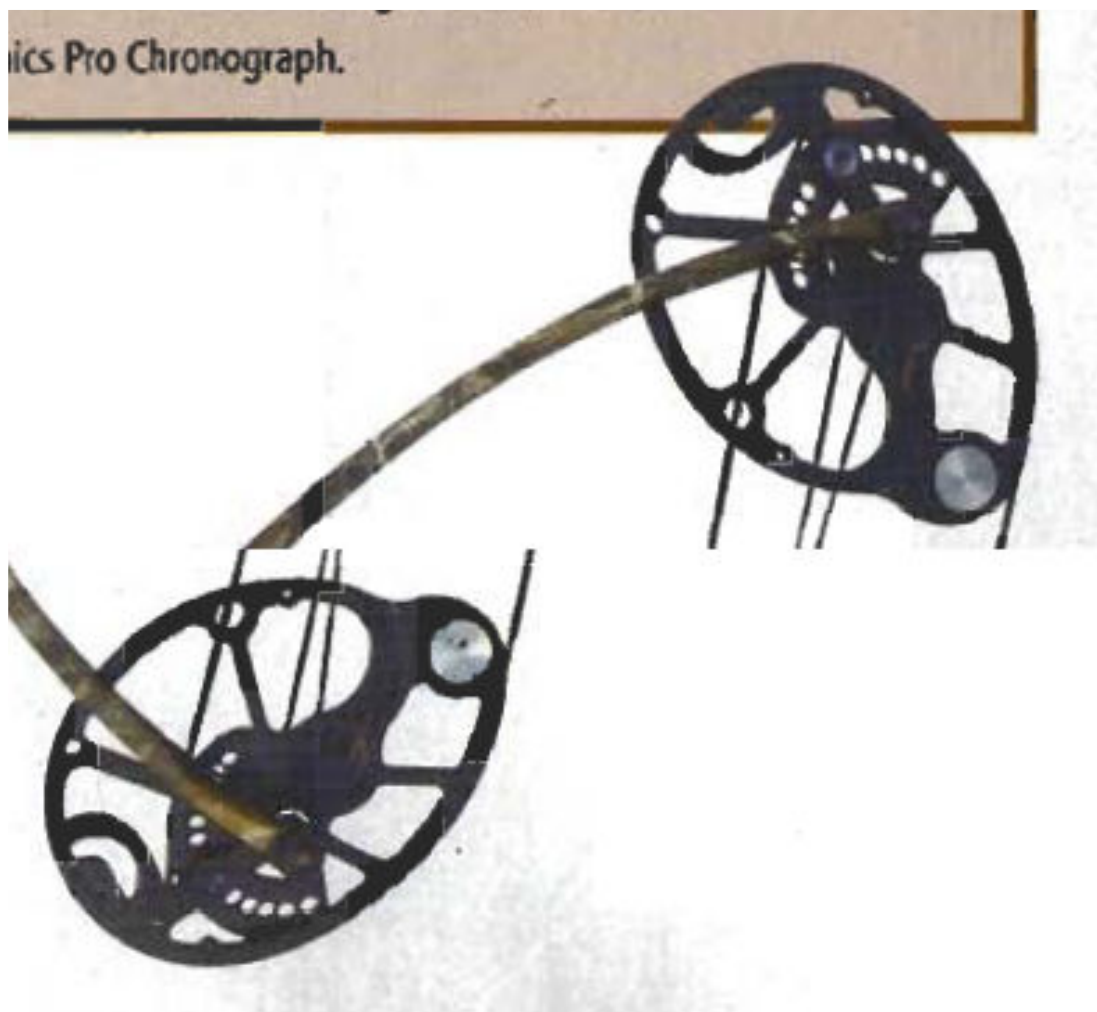


EX2017, App. A, Photos 4 and 5 (annotated).

8. Claims 9 & 18

Claim 9: “The archery bow of claim 8[17], wherein said second rotatable member comprises a mirror image of said first rotatable member.”

The cams of the Mission Menace were mirror images of each other. As shown in the images below, the upper and lower cams of the Mission Menace were mirror images of each other. EX2018, ¶82.



EX2002, 2 (annotated).

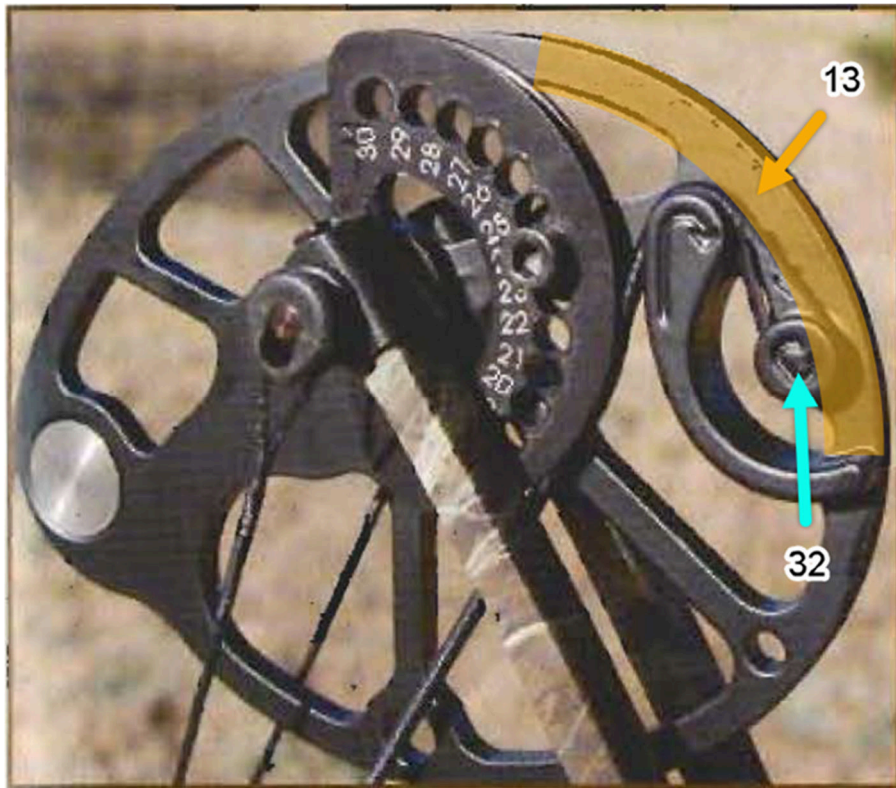


EX2017, App. A, Photos 4, 5.

9. Claim 10

Claim 10: “The archery bow of claim 1, wherein said first rotatable member comprises an outer peripheral structure, said terminal located on said outer peripheral structure.”

As shown in the annotated photograph below, the terminal (32) of the Mission Menace bow as located on an outer peripheral structure (13) of the cam. EX2018, ¶83.



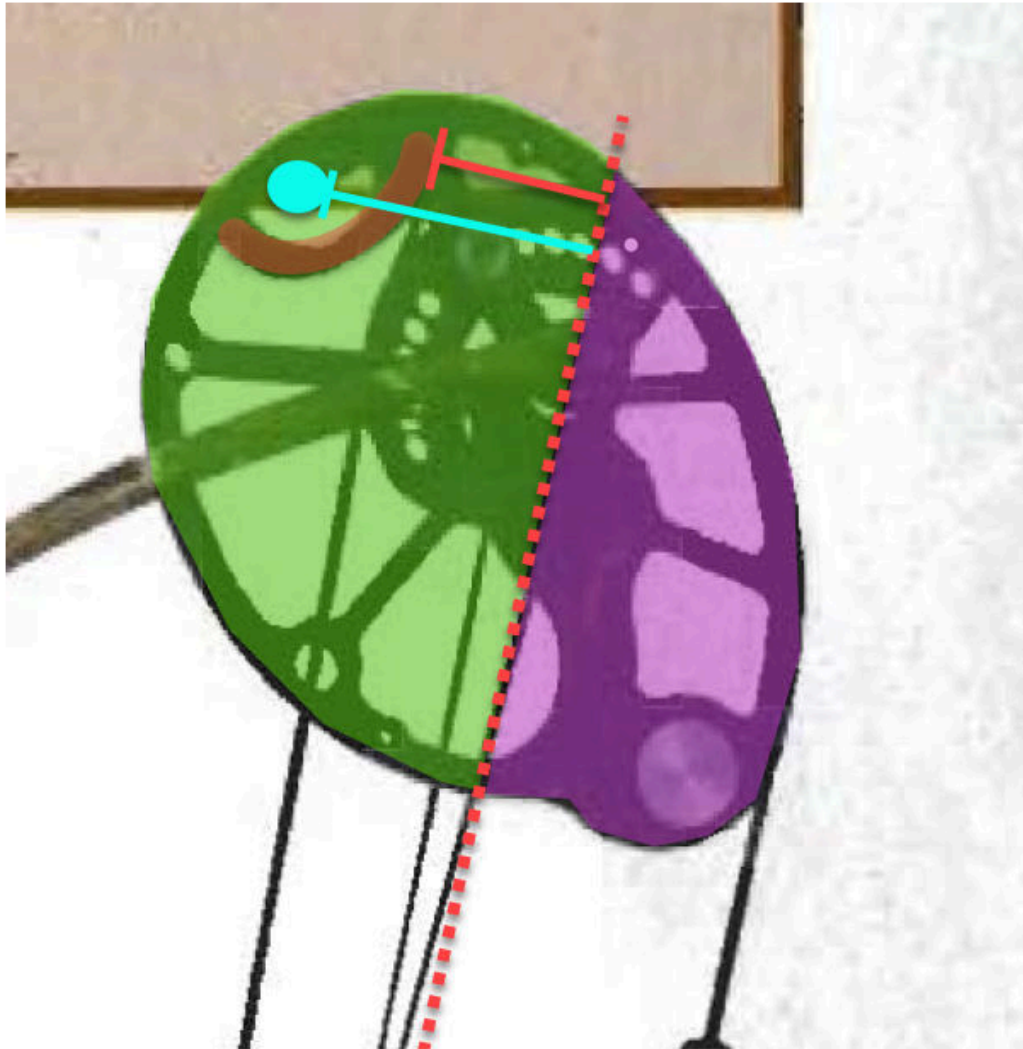
EX2002, 2 (annotated).

10. Claim 13

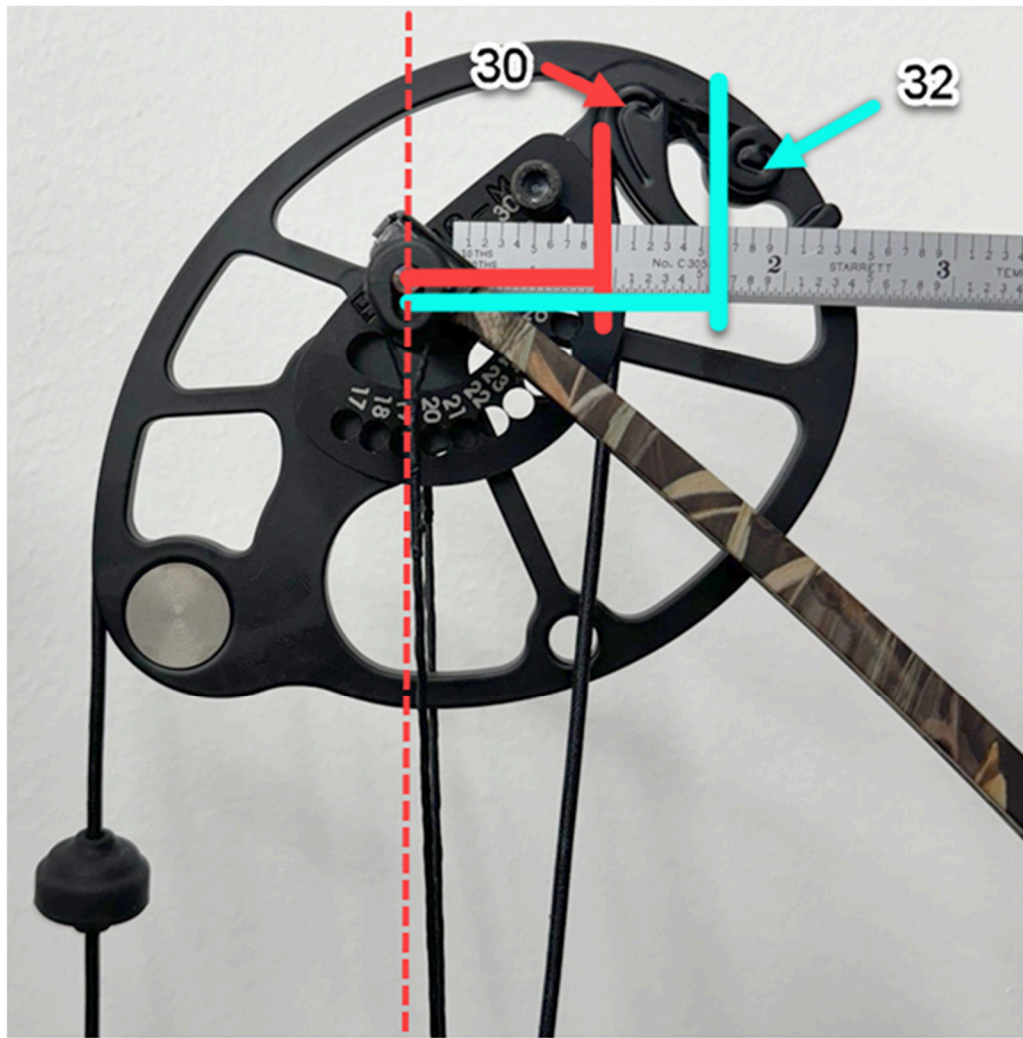
Claim 13: “The archery bow of claim 12, wherein said distance between the terminal and the axle plane is measured orthogonal to said axle plane, and said distance between the capstan and the axle plane is measured orthogonal to said axle plane.”

The upper cam in the full bow photograph from the Mission Menace article is enlarged and annotated below as well as a close up view of the upper cam of the Menace '817 bow is annotated below to illustrate this feature. The dashed red line represents the axle plane of the Mission Menace. *See supra*, claim 12(h). Lines are drawn to show relative distances from the terminal (32, blue) and the capstan (30, red) to the axle plane, as measured approximately orthogonally to the axle plane line.

The drawing demonstrates that the orthogonal distance between the terminal and the axle plane was greater than the orthogonal distance between the capstan and the axle plane.



EX2002, 2 (annotated).



EX2017, App. B, Photo 4 (annotated).

11. Claim 17

“The archery bow of claim 12, further comprising a second power cable, said second rotatable member comprising a second cam track, a second capstan and a second terminal, the second power cable attached to said second terminal and extending toward the first limb, said second power cable comprising a second capstan portion in contact with said second capstan and a second terminal portion in contact with said second terminal, the drawstring extending from the second rotatable member at a second exit location;”

“wherein, in the brace condition, the axle plane divides the second rotatable member to a first part and a second part, the second capstan and the second

terminal located in the first part, the second drawstring exit location located in the second part, and”

“a distance between the second terminal and the axle plane is greater than a distance between the second capstan and the axle plane.”

See supra, claim 12(b)(i)-(ii), 12(c)(ii), & 12(e)(i)-(ii).

D. The Monster bow embodies all the limitations of claims 1-4 and 7-19 of the '989 patent.

The Monster article and the photographs and video of the production Monster '775 bow fully corroborate the testimony that Mr. McPherson's Monster bow was reduced to practice and worked for its intended purposes prior to Darlington's filing date. *See also* §II.C. The following discussion demonstrates that the Monster bow embodied all the limitations of each of claims 1-4 and 7-19. EX2018, ¶¶84-100; *Cooper*, 154 F.3d at 1327; *In re Asahi/America Inc.*, 68 F.3d at 445.

1. Claim 1

***Claim 1(Pre), 1(a), 1(b)(i), & 1(c):*¹³**

The photograph of the full bow from the Monster article and the Monster '775 show the bow in a brace condition with a riser (52) supporting both a first (60) and

¹³ The claim text is recited above in Section C which demonstrates how Menace bow embodies the claims. In Section D claim text is only recited for claims 2, 7, and 15 which were not listed in Section C.

a second limb (62). EX2003, 2. Each limb supports a rotating cam (70, 72) on a respective axle (18, 19), with a drawstring (20) extending between the two cams (70, 72).

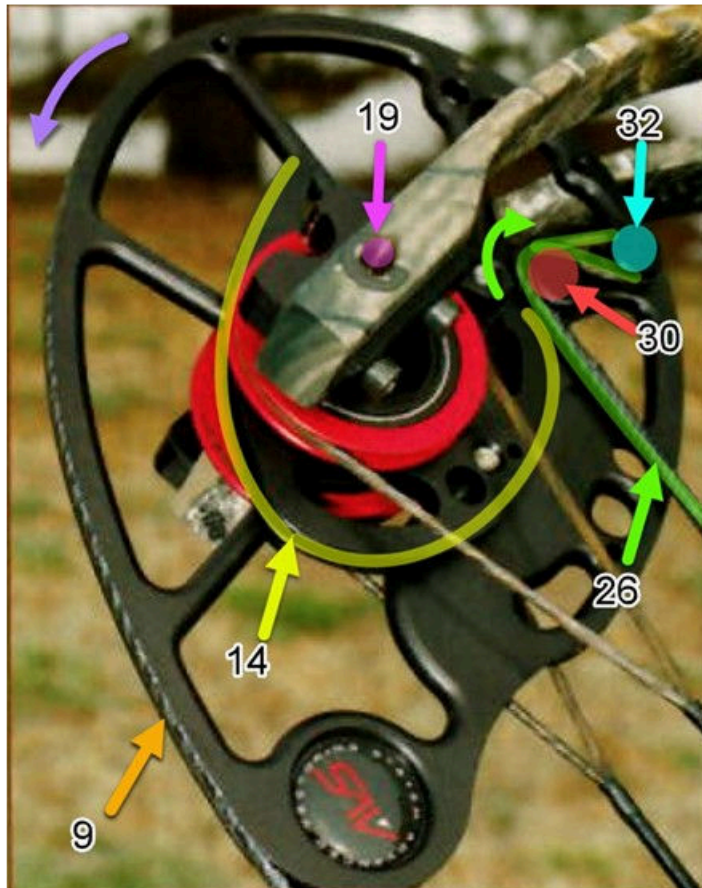


EX2003, 2 (annotated); EX2017, App.C, Photo 2 (annotated).

Claim 1(b)(i)-(v):

The Monster article includes a closeup photograph of one of the Monster bow's cams (reproduced and annotated below). The drawstring track (9), cam track

(14), capstan (30), and terminal (32) are each clearly visible in the photograph. The photograph further shows the cam track offset in a separate plane from the drawstring track.

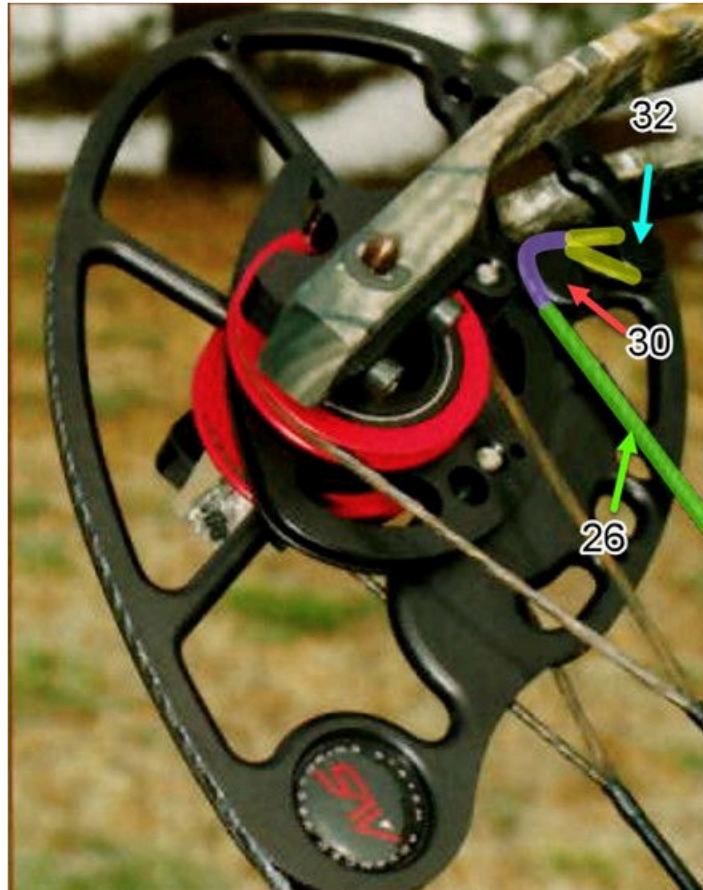


EX2003, 1 (annotated).

Claim 1(d)(i)-(ii):

The cam photograph from the Monster article is annotated below to highlight claim limitation 1(d)(i)-(ii). The Monster bow had a power cable (26). The power cable (26) had a straight portion (green) extending from one cam towards the other

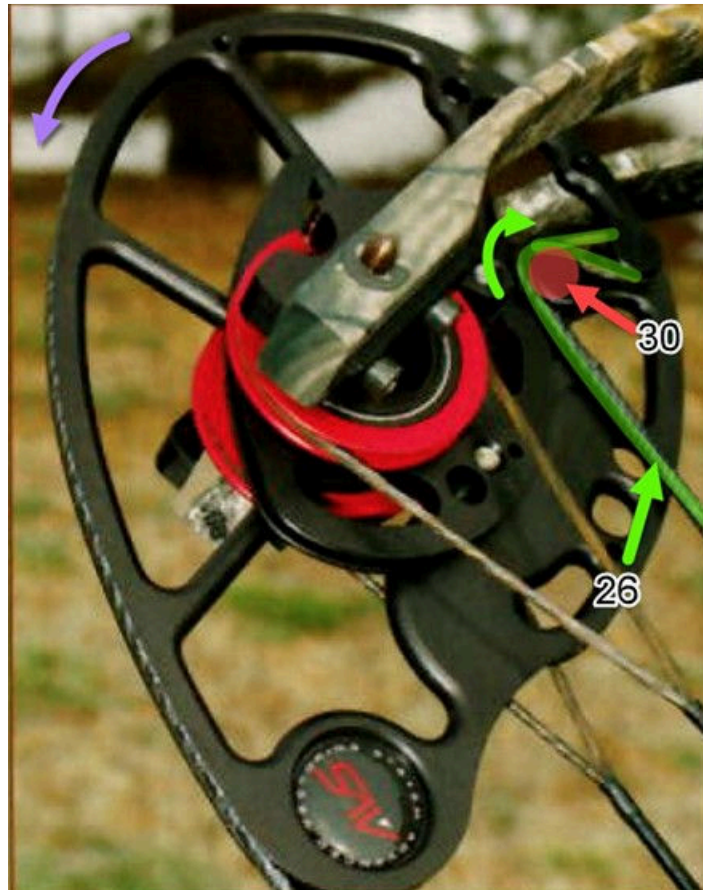
cam. A portion (purple) of the Monster bow's power cable wrapped around the capstan (30) and a portion (yellow) that loops around the terminal (32).



EX2003, 1 (annotated).

Claim 1(e) & 1(f):

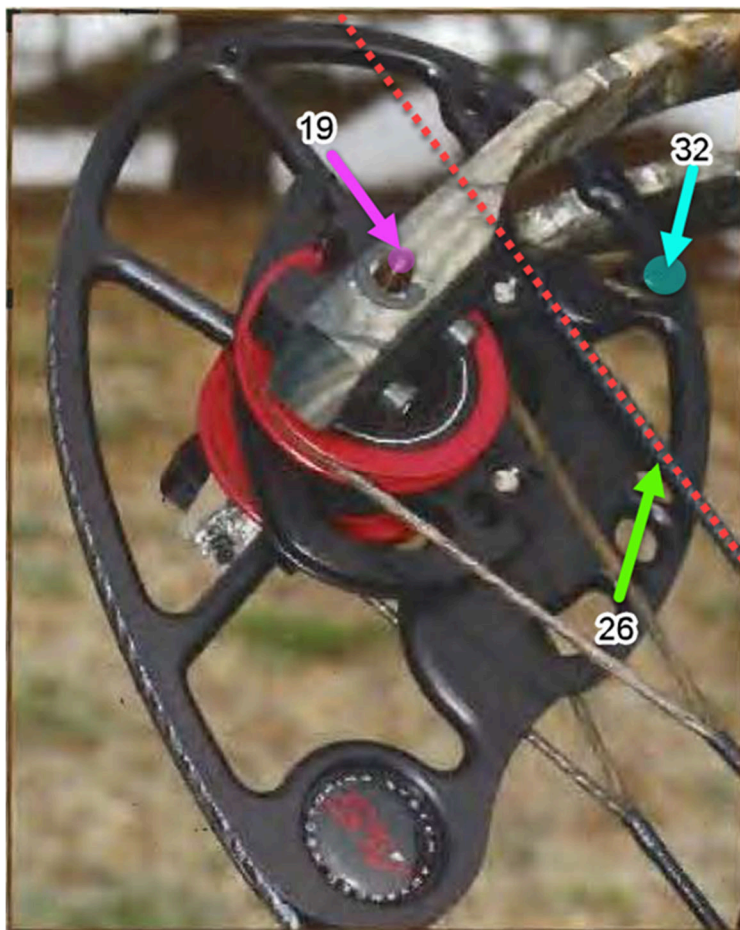
The cam photograph from the Monster article is annotated below to highlight claim limitations 1(e) and 1(f). As shown, the Monster bow power cable (26) wrapped from left to right around the capstan (30), as indicated by the green arrow, while the cam rotated in the opposite direction, indicated by the purple arrow, when the bow is drawn from the brace condition. EX2018, ¶79.



EX2003, 1 (annotated).

Claim 1(g):

The cam photograph from the Monster article is annotated below to highlight claim limitation 1(g). The photograph of the Monster bow shows the cam in the brace condition and has been annotated with a dashed line approximating the plane formed by the straight portion of the power cable (26). EX2018, ¶90. The axle (19) and the terminal (32) are on opposite sides of the plane formed by the straight portion of the power cable (26).



EX2003, 1 (annotated).

All of the features of claim 1 are also depicted in the photographs of the Monster '775 bow. See EX2017, App. C; EX2018, ¶¶52-60.

2. Claim 11

Independent claim 11 is similar to claim 1 except for the following limitation:

Claim 11(g):

When the Monster bow is drawn its capstan is located closer to the elongate straight portion [of the power cable] than the terminal as shown in the annotated photographs below compared with FIG. 5 of the '989 Patent. EX2003; EX2017, App. C, Monster Bow.mp4; EX2018, ¶¶52-60.

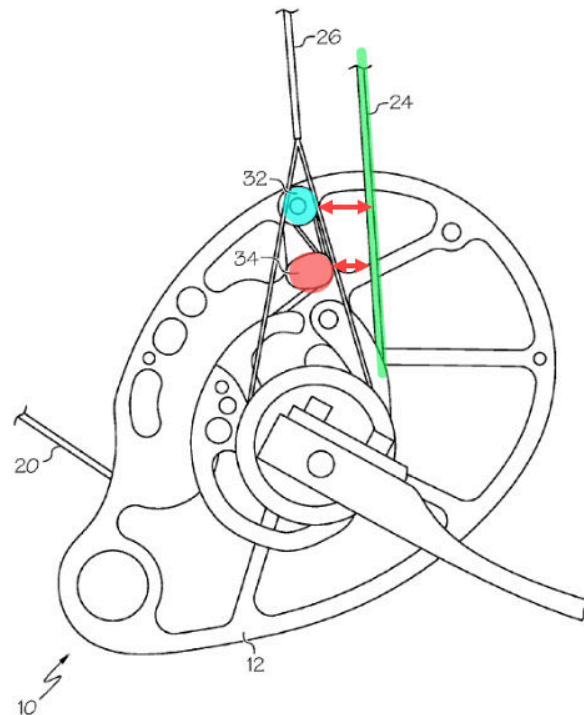
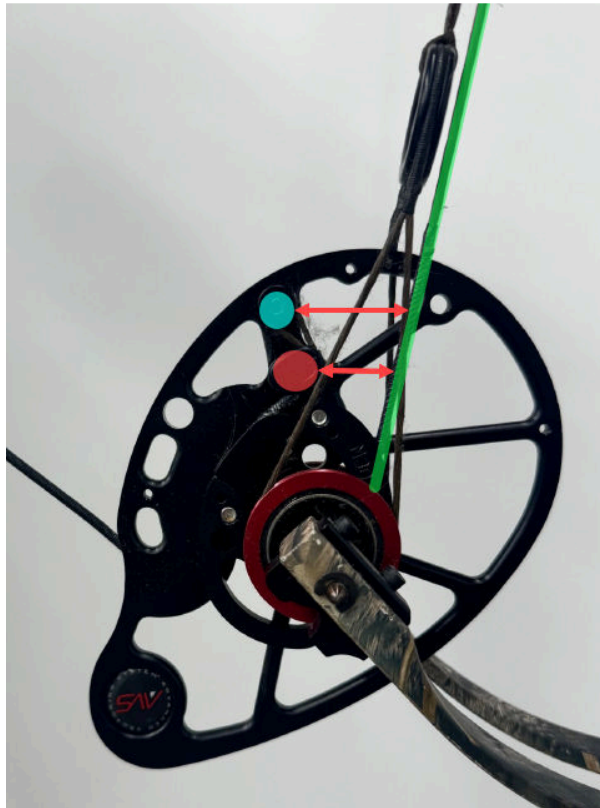


FIG. 5

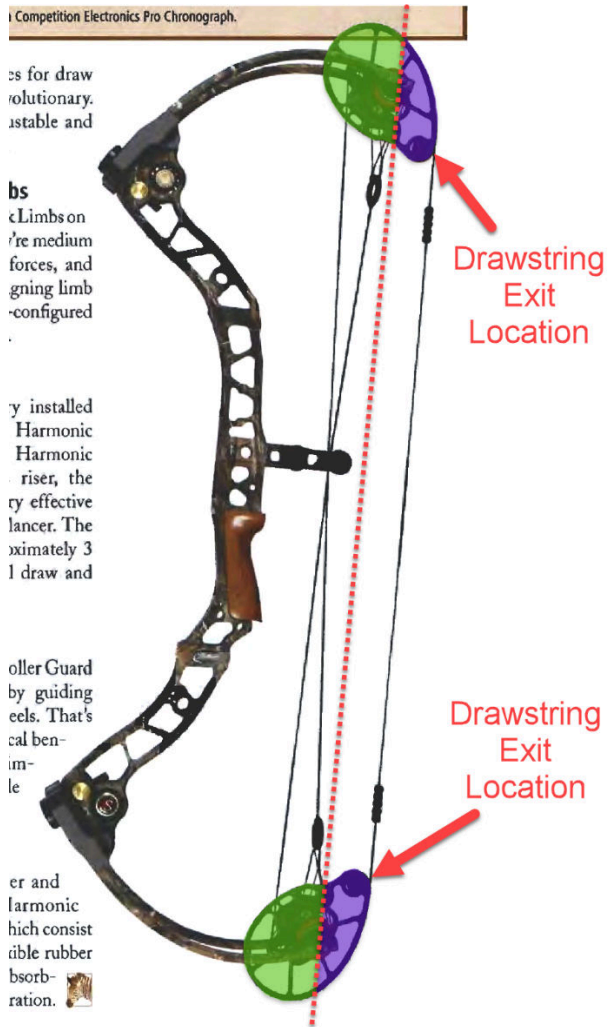
EX2017, App.C, Photo 7; EX1001, FIG. 5 (annotated).

3. Claim 12

Independent claim 12 is similar to claim 1 except for the following limitations:

Claim 12(b)(i)-(ii), 12(c)(i)-(ii), & 12(e)(i):

See supra, claim 1(c). The full bow photograph from the Monster article and Monster '775 are annotated below with a dashed red line showing the axle plane defined by the two axles (18, 19) and to show the drawstring exit location (22) on each cam. EX2018, ¶91. The axle plane of the Monster bow divides each cam into a first part (green) and a second part (purple). The capstan and terminal (circled) were in the green first part, and the drawstring exit (22) was in the purple second part.

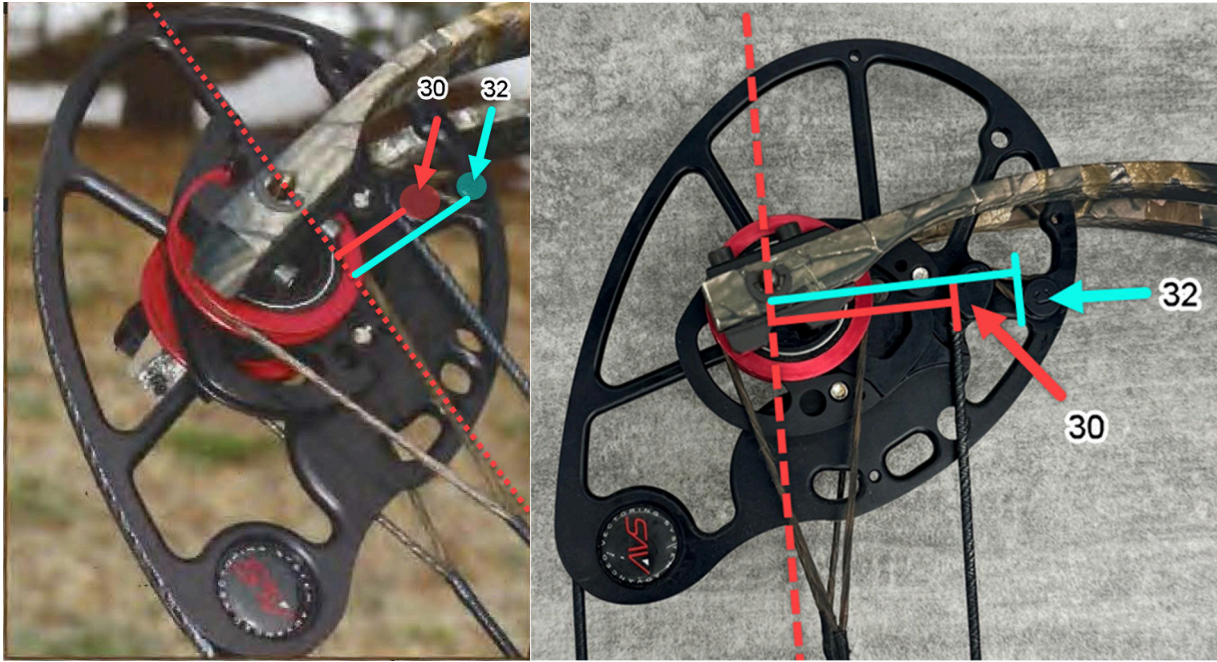


EX2003, 2 (annotated); EX2017, App. C, Photo 2 (annotated).

Claim 12(e)(ii):

Furthermore, the cam photograph from the Monster article and Monster '775 are annotated below illustrating the relative distances between the axle plane (dashed red line) of the Monster bow and the terminal (32, blue) and the capstan

(30, red). The distance (blue) between the terminal (32) and the axle plane was greater than the distance (red) between the capstan (30) and the axle plane.



EX2003, 2 (annotated); EX2017, App. C, Photo 3 (annotated).

4. Claim 19

Independent claim 19 is similar to claim 1 except for the following limitation:

Claim 19(b(i)-(ii):

See supra, claim 12(b)(i)-(ii).

Claim 19(c):

See supra, claim 12(c)(i)-(ii).

Claim 19(e):

See supra, claim 12(e)(i)-(ii).

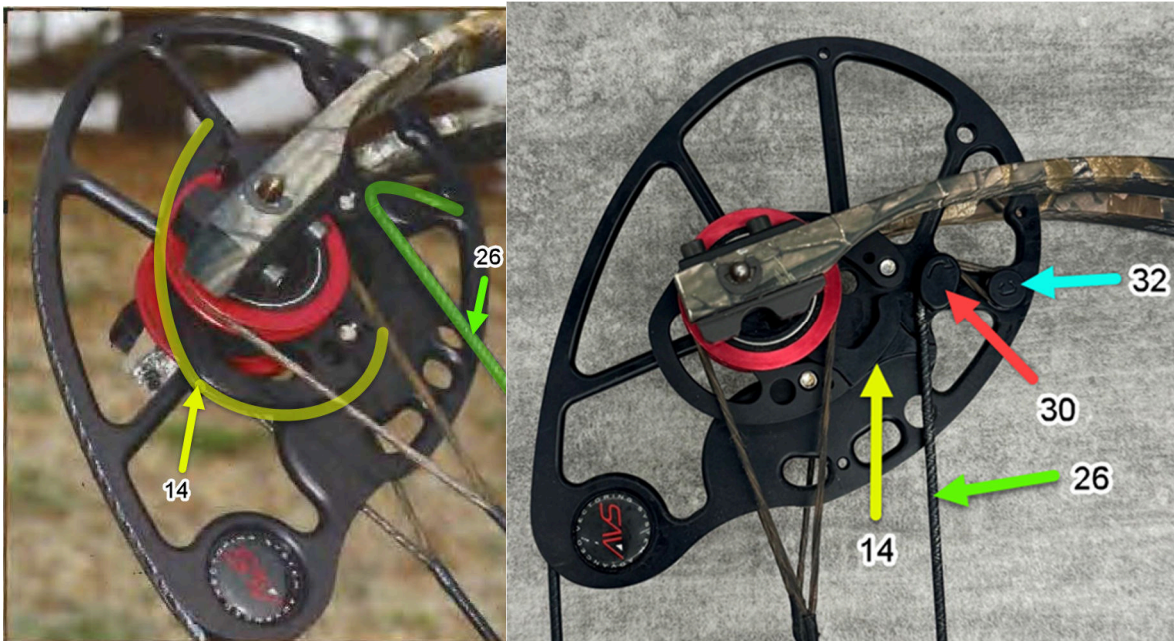
Claim 19(f)(i)-(ii):

See supra, claim 11(g).

5. Claims 2 & 15

Claim 2[15]: “The archery bow of claim 1[12], wherein, in the brace condition, the power cable is not oriented in said cam track.”

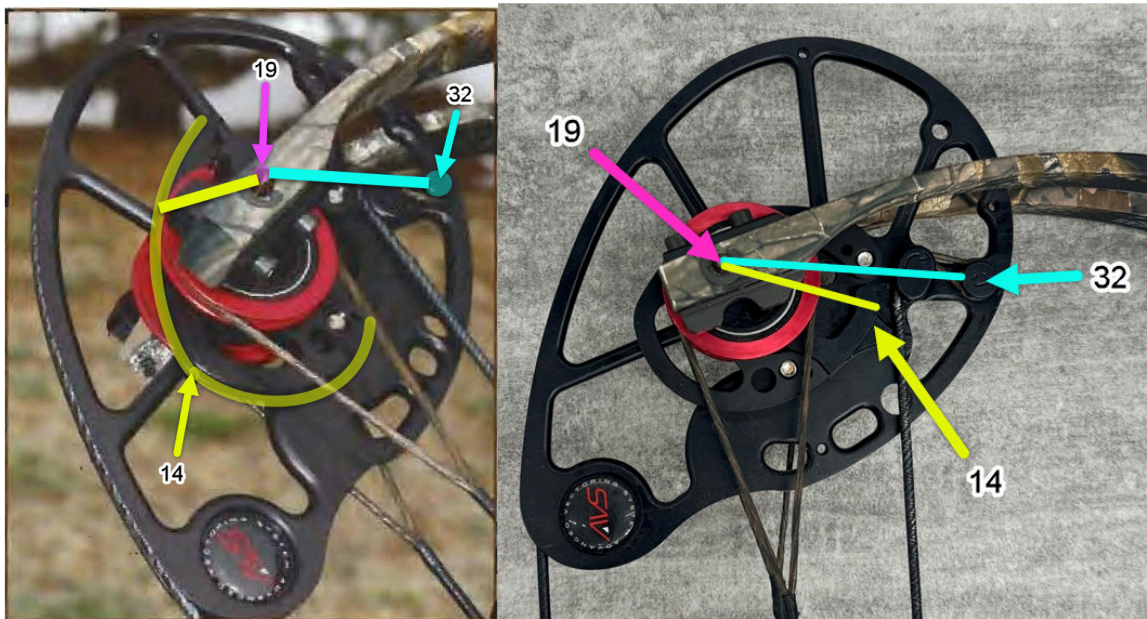
The cam photograph from the Monster article and Monster '775 are annotated below to highlight the limitations of claims 2 and 15. On the Monster bow the power cable (26) did not rest in the cam track (14) while in the brace condition. This can be seen by the fact that the power cable does not change direction in the photograph after looping around the capstan but extends along a straight path towards the opposite cam. EX2018, ¶93.



EX2003, 2 (annotated); EX2017, App. C, Photo 3 (annotated).

6. Claims 3 & 14

The cam photograph from the Monster article and Monster '775 are annotated below to highlight the limitations of claims 3 and 14. On the Monster bow the distance (blue) between the terminal (32) and the axle (19) is greater than the distance (yellow) between the cam track (14) and the axle (19). EX2018, ¶100.



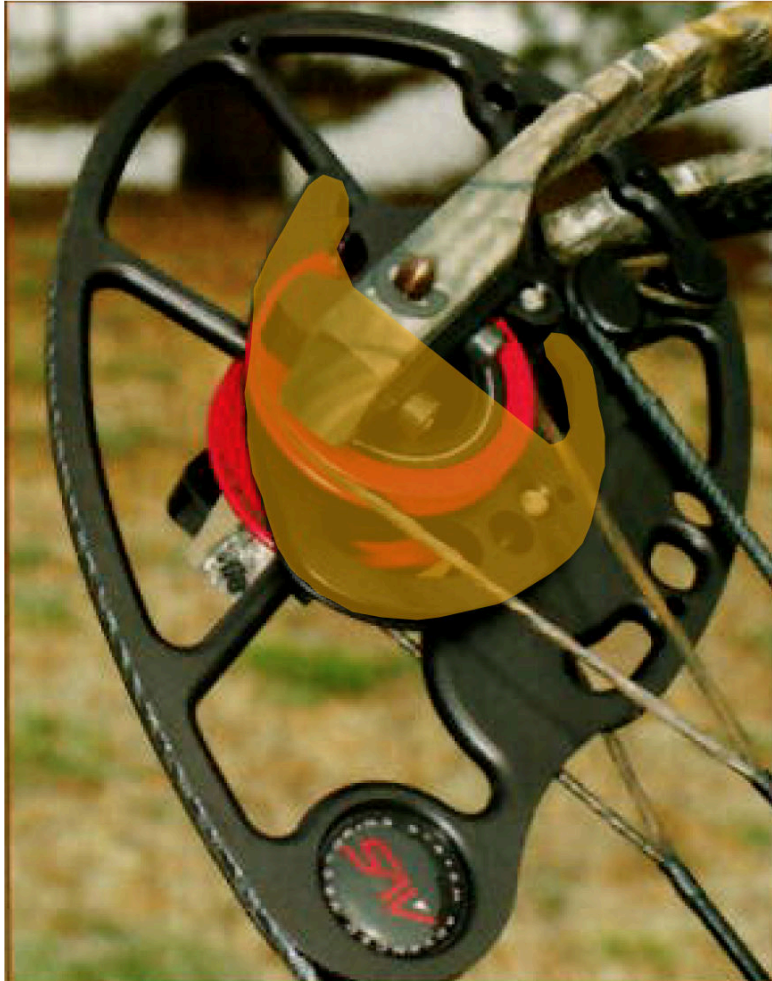
EX2003, 30 (annotated); EX2017, Appendix C, Photo 3 (annotated)

7. Claims 4, 7, & 16

Claim 7: “The archery bow of claim 4, wherein said module is interchangeable with a second module having a different shape.”

The Monster bow included a cam module for changing draw-length. EX2003, 2 (“[The Monster] utilizes interchangeable modules for draw length adjustment.”).

One interchangeable cam module is highlighted in the cam photograph below. The same features can be seen on the photos of the Monster '775 in EX2017, App. C.

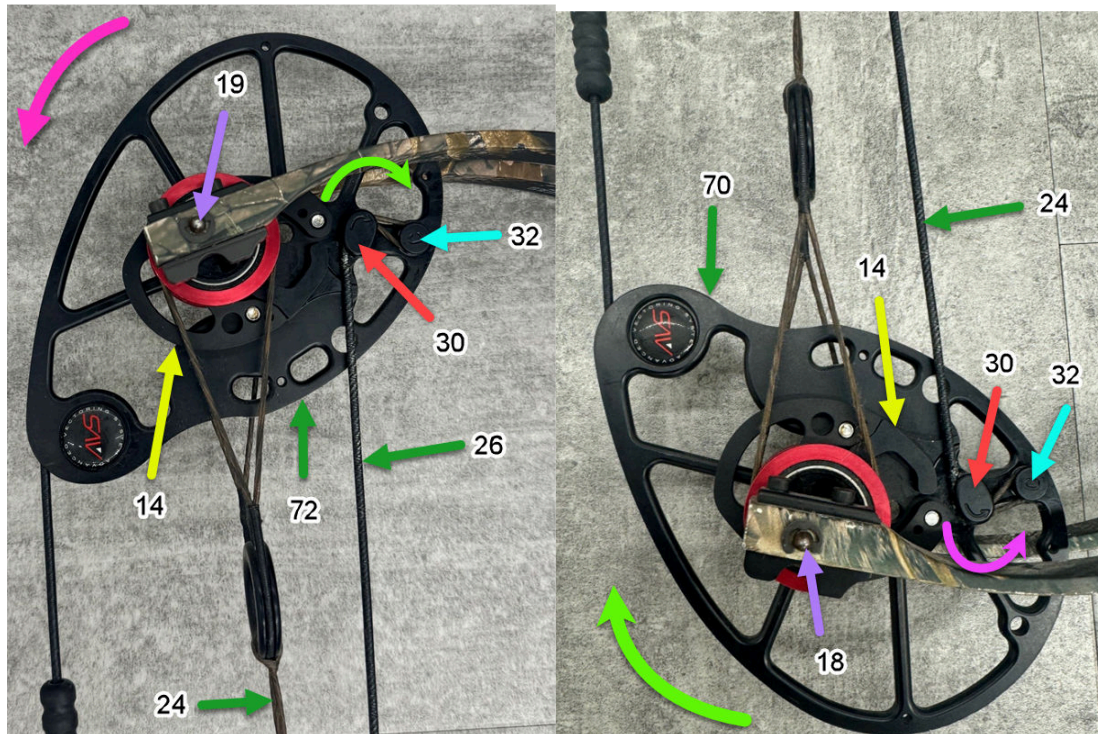


EX2003, 1 (annotated).

8. Claim 8

The Monster bow practiced all the limitations of claim 8 as shown below in annotated photographs of the Monster '775. The power cable (24) wraps around capstan (30) on cam (70) in the opposite direction than the power cable (26) wraps around capstan (30) on cam (72). The bright green arrows indicate a first rotational

direction, and the pink arrows indicate a second rotational direction opposite the first rotational direction. Similar features can also be seen on the bow in the Monster Article. *See* EX2003.



EX 2017, Appendix C, Photos 3 and 4 (annotated)

9. Claims 9 & 18

The Monster bow practiced the limitation of claims 9 & 18, because it had upper and lower cams that were mirror images of one another. *See supra*, Claim 1(Pre), 1(a), 1(b)(i), & 1(c); EX2003; EX2017, App. C, **Monster Bow.mp4**. EX2018, ¶96.

10. Claim 10

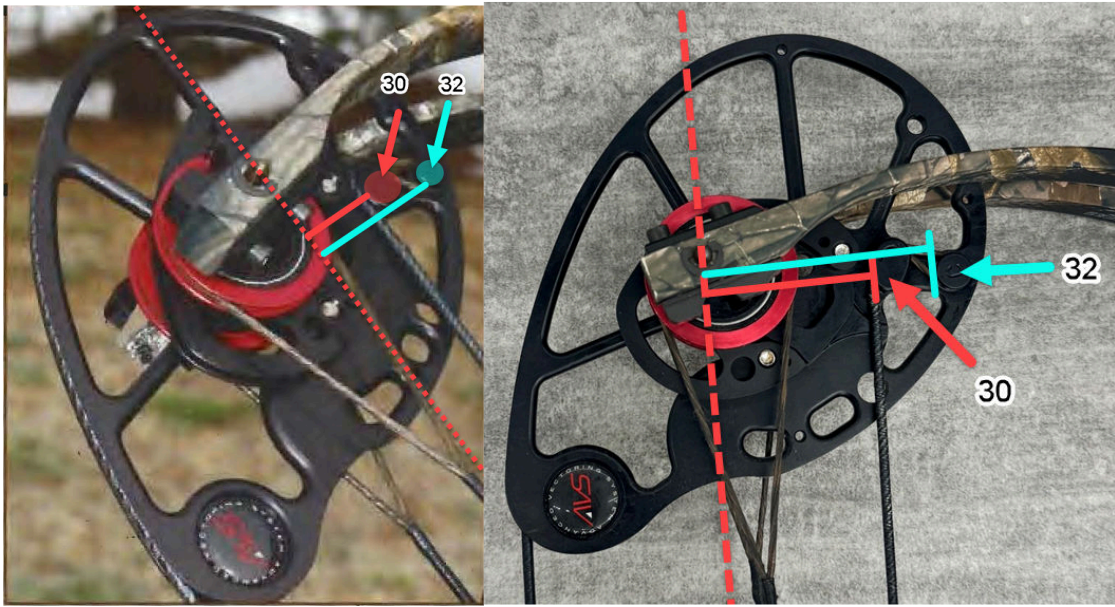
The annotated photographs of the Monster bow below show the terminal (32) on an outer peripheral structure (13) of the cam. EX2018, ¶97.



EX2003, 30 (annotated); EX2017, Appendix C, Photo 3 (annotated).

11. Claim 13

The cam photographs from the Monster article and Monster '775 clearly show that the terminal (32) is farther from the axle plane (dashed line) than the capstan (30) when measured orthogonally to the axle plane. EX2018, ¶92.



EX2003, 1 (annotated); EX2017, Appendix C, Photo 3 (annotated).

12. Claim 17

See supra, claim 12(b)(i)-(ii), 12(c)(ii), & 12(e)(i)-(ii).

E. Provisional Application

The '989 Patent was originally filed as U.S. Patent Application No. 12/895,610 ("610 Application") claiming priority to the filing date (Sep. 30, 2009) of U.S. Provisional Patent Application No. 61/247,473 ("473 Provisional").¹⁴ EX1002, 93 (Filing Receipt); EX2001. The '473 Provisional incorporates U.S. Patent Application No. 12/248,467 ("467 Application") by reference in its entirety

¹⁴ Ravin concedes the '473 Provisional's filing date "as the priority date for the Challenged Claims." Pet., 2.

in accordance with 37 C.F.R. 1.57. See EX2001, 1:9-11 (“All US patents and applications and all other published documents mentioned anywhere in this application are incorporated herein by reference in their entirety”), 4:2 (citing “US Patent Application 12/248,467.”). At the time the ’473 Provisional was filed the ’467 Application was not yet published. When the ’610 Application was filed the incorporation by reference language was updated to identify the publication number of the ’467 Application, namely, U.S. Pat. Pub. No. 2010/0089375 (EX2005). EX1001, 3:19-21 (“Compound bows are generally known, for example as described in US 2010/0089375, the entire content of which is hereby incorporated herein by reference.”). The table below identifies exemplary written description support in the ’473 Provisional for each independent claim of the ’989 Patent.¹⁵

<u>’989 Patent (Claim 1)</u>	<u>Exemplary Support (’473 Prov.) (EX2001)</u>
<i>1(Pre)</i>	pp. 1:4-5 (“This invention relates generally to archery bows and more specifically to a cam configuration suitable for use in bows, such as a compound bow.”); 3:21-23 (“Figure 3 shows a combination of Figures 1 and 2, wherein the subject matter of Figure 1 (brace condition) is shown in dashed lines and the

¹⁵ The chart applies the same claim element labeling applied by Ravin in the corresponding Petition.

	subject matter of Figure 2 (drawn condition) is shown in solid lines.”).
<i>1(a)</i>	The ’467 Application shows a riser. EX2004, FIG. 1. In addition, a riser is an inherent feature of a compound bow. <i>In re Reynolds</i>, 443 F.2d 384, 170 USPQ 94 (CCPA 1971); <i>Yeda Research and Dev. Co. v. Abbott GMBH & Co.</i>, 837 F.3d 1341, (Fed. Cir. 2016). p. 2:16-17 (“The first power cable 24 will extend from an opposite limb or rotatable member (not shown) to the cam 10.”); <i>see also</i> EX2004, FIG. 1. In addition, limbs are inherent features of a compound bow. <i>In re Reynolds</i>; <i>Yeda Research</i>.
<i>1(b)(i)</i>	FIGS. 1-6 (cam 10); pp. 2:1-8 (“Figures 1-3 show an embodiment of a cam 10 that is suitable for use in a compound archery bow. A drawstring 20 is attached to the cam 10, which will typically extend to another rotatable member of the bow, such as a pulley or another cam.”); 2:16-23.
<i>1(b)(ii)-(v)</i>	FIGS. 1-6 (drawstring track – see drawstring path along cam 10, cam track 14, capstan 30, terminal 32); pp. 2:1-8, 2:16-23.
<i>1(c)</i>	FIGS. 1-6 (drawstring 20); p. 2:1-8.
<i>1(d)(i)-(ii)</i>	FIGS. 1-6 (power cable 24).
<i>1(e)</i>	FIGS. 1, 4; pp. 2:24-30 (“the location of the terminal post 32 and the shape of the capstan 30 result in the cable 24 to

	wrapping around the capstan 30 in a direction away from the axle 18 before terminating on the post 32. In some embodiments, the cable wraps around the capstan 30 in a direction opposite the direction of cam 10 rotation as the bowstring 20 is drawn. ”); 3:28-32.
<i>1(f)</i>	FIGS. 1-6; pp. 2:24-30 (“the location of the terminal post 32 and the shape of the capstan 30 result in the cable 24 to wrapping around the capstan 30 in a direction away from the axle 18 before terminating on the post 32. In some embodiments, the cable wraps around the capstan 30 in a direction opposite the direction of cam 10 rotation as the bowstring 20 is drawn. ”); 3:28-32.
<i>1(g)</i>	FIGS. 1, 4 (power cable 24).
<u>’989 Patent (Claim 11)</u>	<u>Exemplary Support (’473 Prov.) (EX2001)</u>
<i>11(Pre) through 11(f):</i> An archery bow having a brace condition and a drawn condition, the archery bow comprising:	<i>See 1(Pre) through 1(g).</i>

11(g)	FIGS. 2, 5 (power cable 24).
<u>'989 Patent</u> <u>(Claim 12)</u>	<u>Exemplary Support ('473 Prov.) (EX2001)</u>
12(Pre), 12(a), 12(b)(iii)- (iv), & 12(d)	<i>See</i> 1(Pre) through 1(g).
12(b)(i)-(ii)	<i>See</i> 1(b)(i); <i>see also</i> FIGS. 1-6 (axles 18); p. 2:16-17 ("The first power cable 24 will extend from an opposite limb or rotatable member (not shown) to the cam 10."); although not show in the figures a POSITA would understand that a plane is formed between two axles of a compound bow. EX2018, ¶¶105-107.
12(c)(i)-(ii)	<i>See</i> 1(c); FIGS. 1, 4 (showing exit locations of drawstring 20 on cam 10).
12(e)(i)	FIGS 1, 4 (cam 10, axle 18, drawstring 20, terminal 32); a plane extending between the two axles of a compound bow with the cam configuration shown in FIGS. 1, 4 will divide the cam 10 into two sections with the drawstring exit on one side of the plane and the terminal 32 on the other. EX2018, ¶¶105-107.
12(e)(ii)	FIGS 1, 4 (axle 18, capstan 30, terminal 32); the distance between the capstan 30 and the axle 18 is clearly shorter (and consequently an axle plane) than the distance between the terminal 32 and the axle 18. EX2018, ¶¶106-107.
12(f)(i)-(ii)	FIGS. 1, 4 (power cable 24).
<u>'989 Patent</u> <u>(Claim 19)</u>	<u>Exemplary Support ('473 Prov.) (EX2001)</u>

<i>19(Pre)- 19(b)(iv), 19(d), & 19(e)</i>	<i>See 1(Pre) through 1(g).</i>
<i>19(c)</i>	<i>See 1(c); FIGS. 1, 4 (show exit locations of drawstring 20 on cam 10).</i>
<i>19(f)(i)-(ii)</i>	<i>FIGS. 2, 5 (power cable 24).</i>

IV. PETITIONER FAILS TO SHOW THAT THE CLAIMS WOULD HAVE BEEN OBVIOUS

Petitioner “has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363; *see also* 35 U.S.C. § 312(a)(3). Thus, Petitioner has the burden of proving how Darlington in combination with Islas rendered the Challenged Claims unpatentable. Yet, Petitioner’s sole ground of unpatentability is full of holes. Pet., 4.

Not only has Petitioner advanced Darlington, a reference it knew was not prior art, Petitioner waives hands over the actual “scope and content” of Darlington and Islas. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966); EX2009. In so doing, Petitioner fails its burden to prove that every limitation of the Challenged Claims was rendered obvious by its proposed combination of Darlington and Islas. Petitioner also fails to present a logical rational for its proposed combination. *In re Nuvasive, Inc.*, 842 F.3d 1376, 1382 (Fed. Cir. 2016); *PersonalWeb Techs., LLC v.*

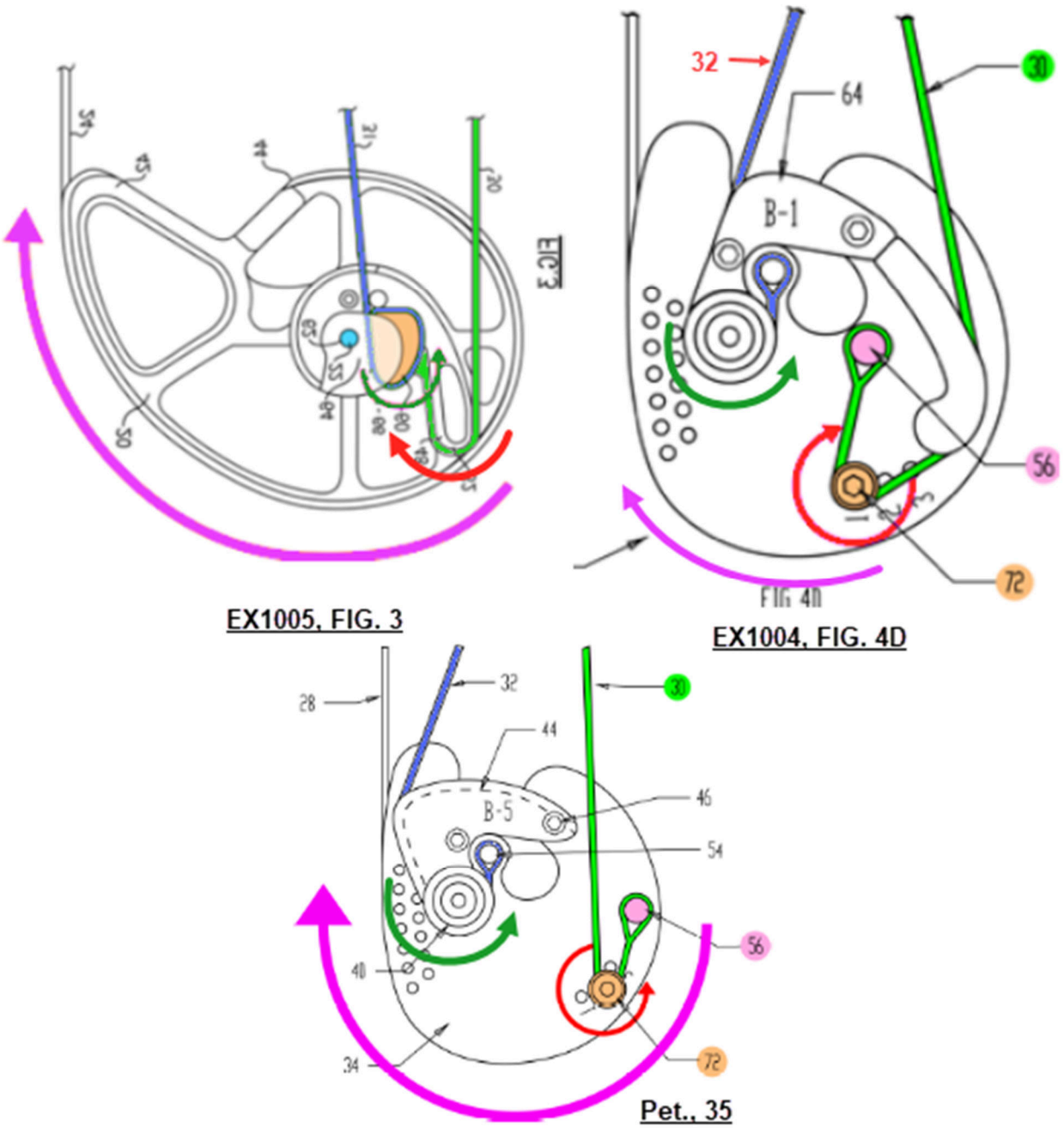
Apple, Inc., 848 F.3d 987, 993-94 (Fed. Cir. 2017)). Petitioner’s challenge cannot succeed.

A. Petitioner fails to apply foundational principles of obviousness law in creating its modified bow cam.

Obviousness under § 103 “is a question of law based on underlying findings of fact.” *In re Gartside*, 203 F.3d 1305, 1316 (Fed. Cir. 2000). The first of the underlying findings of fact enumerated by the Supreme Court is to consider “the scope and content of the prior art.” *Graham*, 383 U.S. at 17. In particular, Petitioner adds multiple concepts to its proposed combination that are simply not disclosed or suggested in either Darlington or Islas and, consequently, outside the scope and content of the alleged prior art.

Petitioner purports to modify the pulley 22 (asserted as the claimed rotatable member) shown in Darlington’s FIG. 2 based on teachings from Islas. See Pet., 31-36. Yet, when Darlington and Islas are viewed side-by-side, as shown below, it is evident that Petitioner’s modified “Darlington pulley” has features that are not present in either Darlington or Islas. *Id.*; EX2018, ¶112. As will be discussed in more detail below, neither Darlington nor Islas disclose an anchor 56 (asserted as the claimed terminal) near the periphery of a pulley. Neither reference discloses having both power cables on a pulley wrapping in a direction opposite to the

direction the pulley rotates during draw (purple arrows). And, neither reference shows a power cable that wraps around a cam module in one direction and then wraps outwardly around a second fixed point (e.g., a capstan) in the opposite direction before connecting to an anchor. Importantly, these are failings of the first *Graham* inquiry - failings in Petitioner's prior art that it overlooked in creating its modified pulley. In other words, Petitioner's modified pulley has no basis in the prior art, regardless of whether the modified pulley meets the particular language in McPherson's patent's claims. The claims are immaterial to understanding these failings of Petitioner's ground.



Pet., 31, 29, 35 (Islas FIG. 3, Darlington Fig. 4D, and Petitioner's

modified pulley with additional annotations).¹⁶

Anchor Position

In proposing its modified pulley 22, Petitioner places Darlington's anchor 56 outward near the outer edge and periphery of the pulley 22. Pet., 33, 35. Petitioner incorrectly alleges that the modification is taught by Islas. Pet. 33. Yet, neither Darlington nor Islas teach this anchor location, and Petitioner's expert agrees. EX1003, ¶¶56, 57; EX2012, 55:4-56:12, 72:6-16, 76:2-77:22. Initially, in his declaration, Petitioner's expert Lange states that an "anchor point" is "described but not illustrated" in Islas and that the **only** teaching of Islas being combined with Darlington is "the rotational direction of the power cable around the orange element [second power cam 60]." EX1003, ¶¶56, 57. Lange confirmed in his deposition that Islas does not show an anchor point on the periphery of a pulley:

¹⁶ Islas' FIG. 3, here, is rotated and flipped to show the drawstring on the same side as in Darlington's FIG. 4D and Petitioners modified pulley.

11 **Q. You can tell by looking at the**
12 **embodiments in Islas that Islas doesn't have**
13 **anchor points on the periphery of the cam; right?**

14 A. Islas does not show any anchor points.
15 So I don't know where the designer might have
16 imagined them to go.

17 **Q. Nothing in Islas teaches the reader to**
18 **put an anchor point on the periphery of the cam;**
19 **does it?**

20 A. I don't believe anything in Islas
21 teaches the reader anything about where to place
22 an anchor.

EX2012, 77:11-77:22.

6 **Q. Where is the anchor point of power**
7 **cable 30 on cam 20?**

8 A. I don't know precisely.

9 **Q. Do you know approximately?**

10 A. I don't see it depicted. So I don't
11 know where it is intended to be placed on this
12 cam.

13 **Q. You know that power cable 30 is**
14 **anchored to cam 20 at some point; you just don't**
15 **know where?**

16 A. Yes. It stands to reason.

EX2012, 72:6-16.

2 Q. Where is power cable 31 anchored on
3 cam 20?

4 A. Specification only states that it is
5 attached at an anchor point.

6 Q. You don't know where that anchor point
7 is?

8 A. I expect that it is coincident with
9 the end of the cable.

10 Q. And you don't know where that is on
11 cam 20?

12 A. It's not depicted in Figure 3.

13 Q. And you're not sure where it is; are
14 you, sir?

15 A. I would expect that it's below
16 number 64.

EX2012, 55:2-16 (discussing Islas), see also 55:17-56:12. He also confirmed that Darlington does not show its anchor point 56 on the periphery of a pulley. Referring first to his modified pulley and Darlington, Lange testified that:

9 Q. Anchor point 56 is on the periphery of
10 the cam; right?
11 A. In which figure again, please?
12 Q. Well, generally, I would say in the
13 combination of Darling -- in your combination of
14 Darlington and Islas, you have placed anchor
15 point 56 on the periphery of the cam; right?
16 A. I would say so.
17 Q. Now, in Darlington, Darlington doesn't
18 show anchor point 56 on the periphery of the cam;
19 does it, sir?
20 A. It does not.

EX2012, 76:9-20.

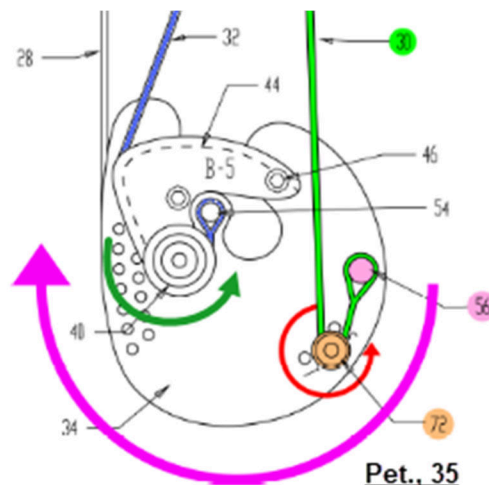
Mr. Lange is correct. Neither Darlington nor Islas disclose, or even suggest, positioning an anchor point on or even near a periphery of the pulley as in Petitioner's modified pulley. EX2018, ¶113. Darlington's anchor 56 is near the center of its pulley 22. EX1004, FIG. 4D (anchor 56). Islas' anchor for cable 31 is "below [element] number 64" and even closer to its rotational axis 22 and center of cam member 20 than to its periphery. EX2012, 55:5-16; EX2018, ¶113. The position of the anchor on the pulley is not arbitrary. It is functional, affecting the forces exerted by, and the movement of, the power cable on the pulley. EX2018, ¶¶113-130.

Petitioner's relocation of Darlington's anchor 56, while critical to its combination, is simply unsupported by its prior art and illustrates a failure by

Petitioner to correctly perform the first inquiry of *Graham*. Petitioner's proposed obviousness argument is, therefore, legally flawed for this reason alone.

Cable Wrapping Directions

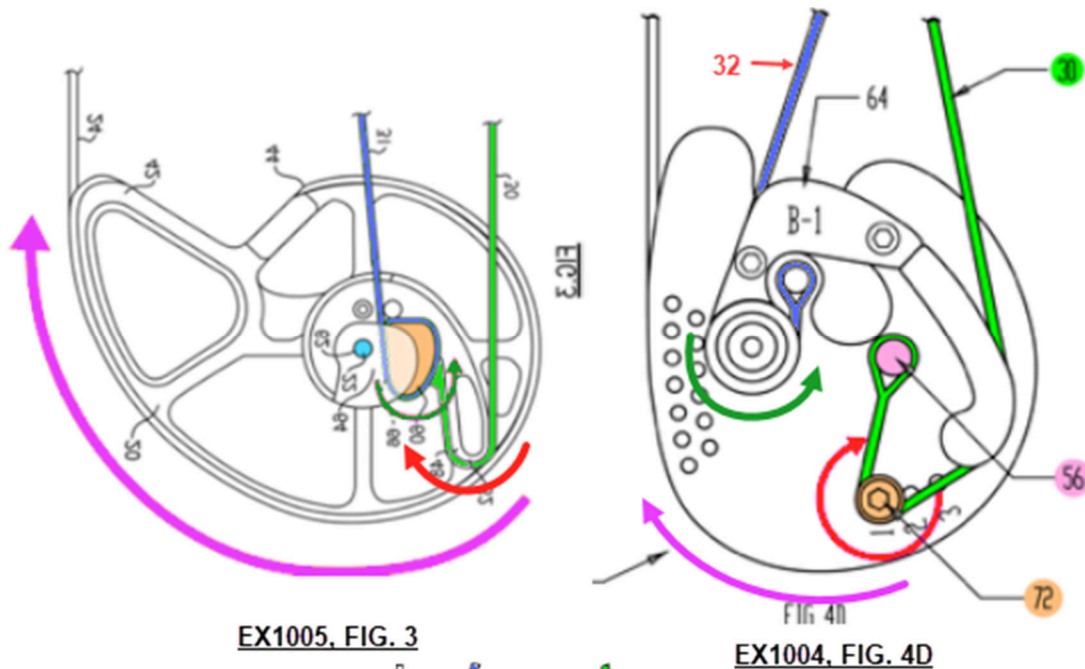
There are other failures of Petitioner's proposed modifications to Darlington's pulley 22. Petitioner's modified pulley is premised on having two power cables 30 and 32 of the same pulley that both wrap in the ***same direction*** relative to the draw direction of the pulley (counter-clockwise as shown below in green and red). Yet, neither Darlington nor Islas disclose such a configuration.



Pet., 35 (Petitioner's modified pulley).

Instead, as shown below, Darlington and Islas each show power cables of the same pulley wrapped in ***opposite directions***. EX1004, FIGS. 1, 1-A; EX1005, FIGS. 1, 3; EX2018, ¶¶111-113; EX2012, 41:18-42:16 (referencing EX2010),

73:9-74:17 (referencing EX2011). Darlington's power cable 32 and Islas' power cable 31 wrap opposite to the direction the pulley rotates during draw, while Darlington's power cable 30 and Islas' power cable 30 wrap in the same direction the pulley rotates during draw. *Id.*



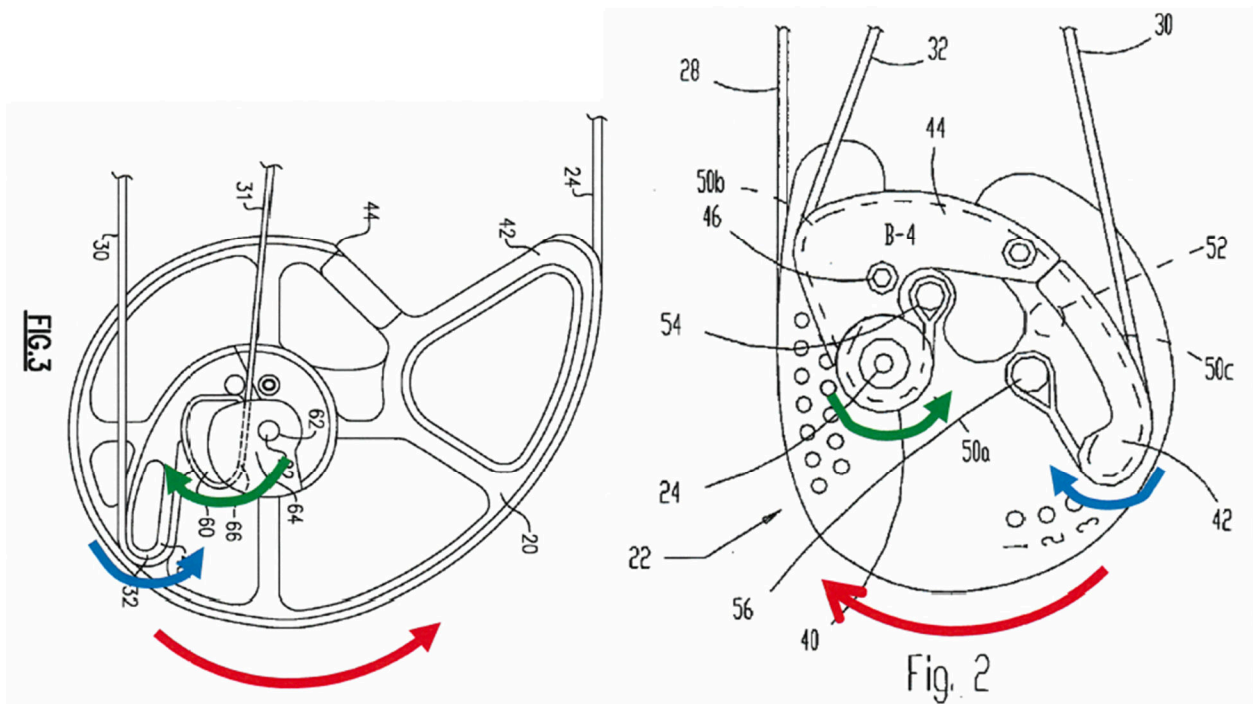
Pet., 29, 31 (Islas FIG. 3 and Darlington Fig. 4D with additional annotations).

In other words, Darlington's and Islas' teachings to wrap power cables on the same pulley in *opposing directions* are antithetical to Petitioner's proposed combination having power cables on the same pulley wrapped in the *same direction*. EX2018, ¶¶111-113.

Petitioner attempts to justify its combination by characterizing Islas' cable 31 as different because it passes the power cable across axis 22, behind element 64.

Pet., 31; EX1003, ¶¶55, 57; *see* EX1005, [0032], FIG. 4. But, Lange is clear that “**only** the rotational direction of the power cable around the [cam 60] is being combined.” EX1003, ¶57. Both experts agree that the cable wrapping directions in Darlington and Islas are the same (opposing) directions. EX2018, ¶¶111-113; EX2012, 41:18-42:16 (referencing EX2010), 73:9-74:17 (referencing EX2011).

Not only is Petitioner’s failure to account for the actual “scope and content” of the prior art, as discussed above, a fatal legal failing under the first inquiry of *Graham*, Petitioner’s failure to explain why a POSITA would look to Islas for a concept (a power cable wrapping opposite the direction of cam rotation) that is already present in Darlington is also contrary to the law. *In re Nuvasive, Inc.*, 842 F.3d 1376, 1381-82 (Fed. Cir. 2016) (A legally sufficient obviousness analysis must be “thorough and searching,” and must “articulate a satisfactory explanation ... including a rational connection between the facts found and the choice made.”).



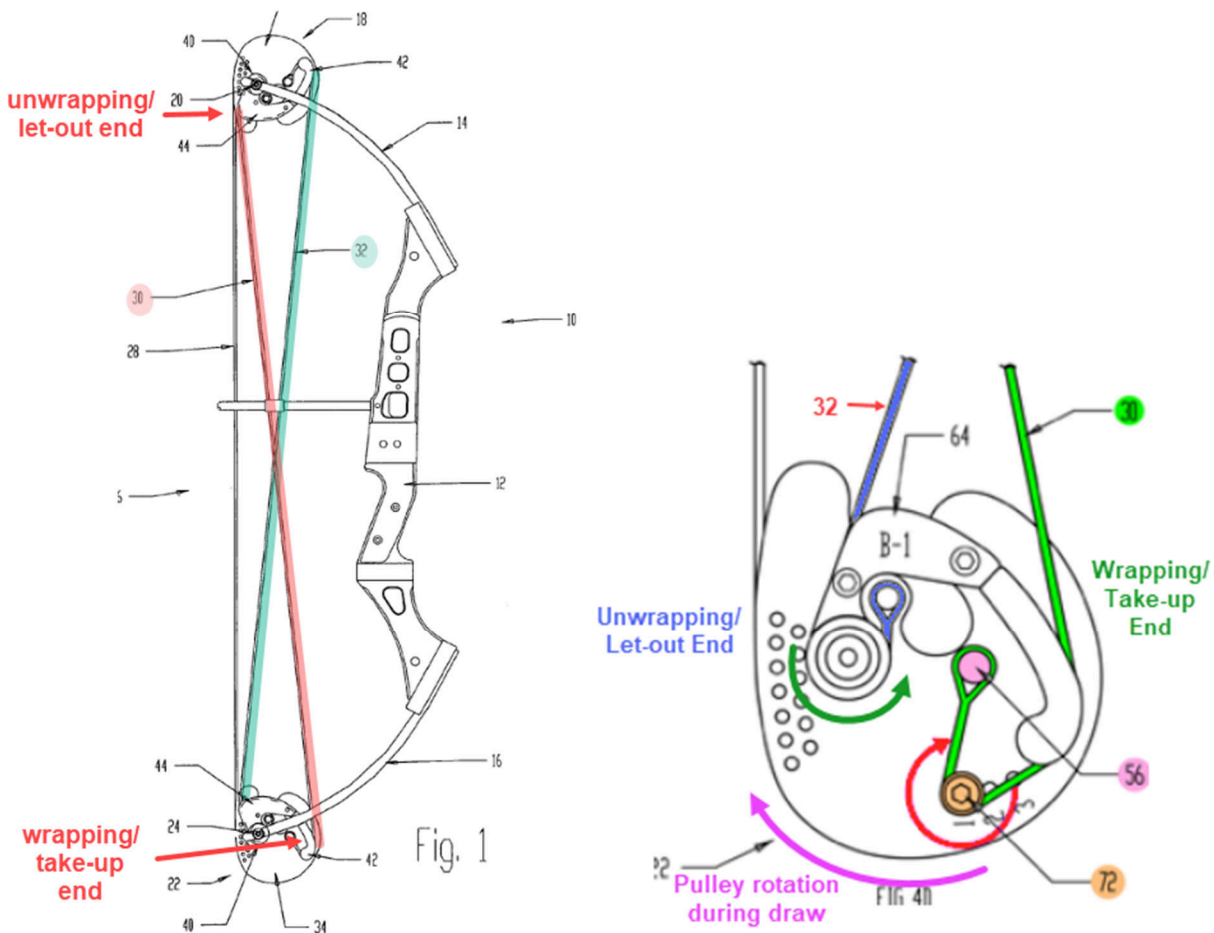
EX2011 (Islas FIG. 3); EX2010 (Darlington FIG. 2) (with arrows showing cable wrapping directions and cam rotation direction's confirmed by Lange)

There are yet further differences that Petitioner fails to account for in the “scope and content” of its cited references. Darlington and Islas both describe bows with synchronized cams in which, during draw, each power cable is concurrently wrapped at one end and unwrapped at the opposite end. EX2018, ¶¶112-113; EX2012, 41:18-42:16 (referencing EX2010), 73:9-74:17 (referencing EX2011). EX2018, ¶112. The function of each cable end, which Petitioner neglects to consider, is critical in understanding the operation of both bows. EX2018, ¶¶111-113. Darlington explains how, as the bow is drawn, one end of the power cable (*i.e.*,

the “take-up” or “wrapping end”) is wrapped or taken-up in a cable groove section of one pulley, while the opposite end (referred as the “let-out” or “unwrapping end”) is unwrapped from or let-out of the cable groove section of the opposite pulley. *Id.*

Darlington describes:

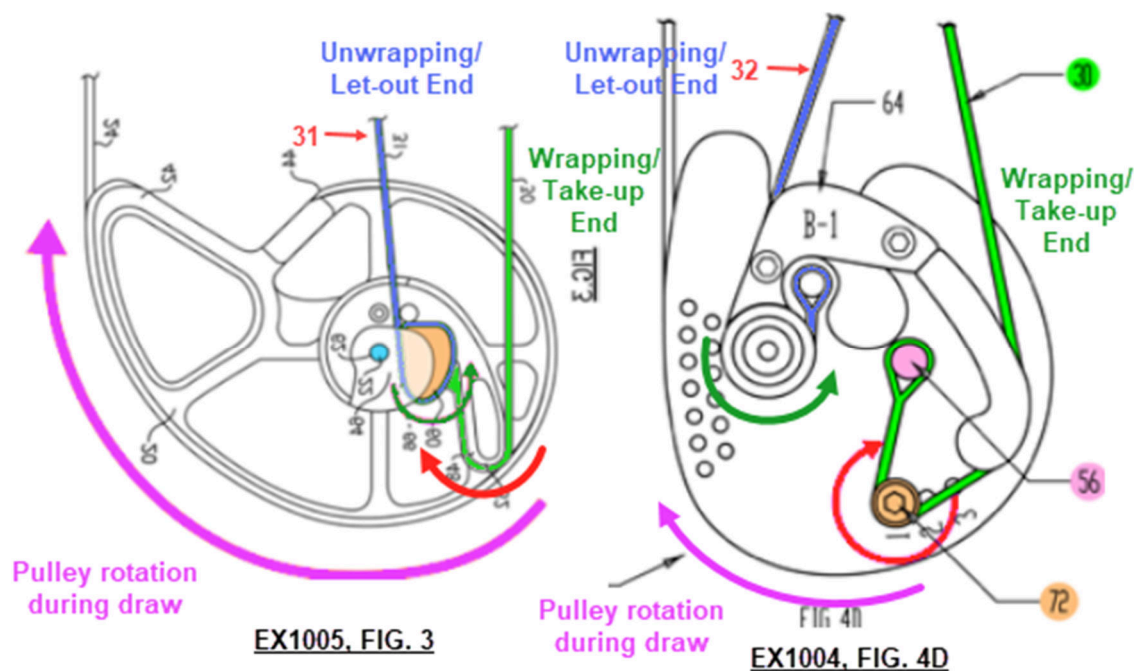
As bowstring cable 28 is drawn from the rest position of FIGS. 1 and 2 toward the fully drawn position of FIG. 1A, the bowstring cable is withdrawn from the bowstring let-out grooves 38 on the upper and lower pulleys, upper pulley 18 is rotated counterclockwise in FIGS. 1 and 2, and lower pulley 22 is rotated clockwise, around the respective axles 20, 24. **Power cable 30 is let out** from cable groove sections 50b and then 50a on pulley 18 **while being taken up** in groove section 50c, then groove section 50b and then groove section 50a on pulley 22. At the same time, **power cable 32 is taken up** into cable groove section 50c, then cable groove section 50b and then groove section 50a on pulley 18 **while being let out** of groove section 50b and then section 50a on pulley 22. EX1004, col. 3:14-26 (emphasis added).



EX. 1004, FIG. 1 & 4D (annotated)

Petitioner's failure to consider the function of each power cable end leads Petitioner to make the unjustified assertion that Islas teaches a cable wrapping direction that is different from Darlington. Pet., 31-32. It is not. Petitioner relies on the wrapping direction of Islas' power cable 31 in FIG. 3, which is Islas' unwrapping (let-out) end of cable 31. This unwrapping end of cable 31 is wrapped in the same direction, relative to the pulley rotation during draw, as the unwrapping (let-out) end of Darlington's cable 32. EX2018, ¶¶111-113; compare EX1005,

FIG. 3 *with* EX1004, FIG 4D (both reproduced below from Pet., 31, 29 with additional annotations, EX1005, FIG 3 is also flipped and rotated to show the same orientation as EX1004, FIG. 4D); *see also* EX2012, 41:18-42:16 (referencing EX2010), 73:9-74:17 (referencing EX2011) (Petitioner's expert confirming cable wrap directions).



Pet., 31, 29 (Annotated Islas FIG. 3 and Annotated Darlington Fig. 4D, with additional annotations to their power cables)

If it were in fact true that the “**only**” concept from Islas being combined with Darlington was “the rotational direction of the power cable around [cam 60],” no modifications would be necessary because the concept already exists in Darlington. EX2018, ¶112. Instead, Petitioner seeks to move a wrap direction from an

unwrapping (let-out) power cable end in Islas to a wrapping (take-up) power cable end in Darlington. But, in so doing Petitioner improperly ignores the “scope and content” of its art, by ignoring the function of each power cable end.

Furthermore, as Dr. Reinholtz explains, a POSITA would not have considered the wrapping direction of Islas’ let-out end in modifying the wrapping direction of Darlington’s take-up end given the differences in purpose and function of the ends. EX2018, ¶¶111-113 (citing EX2020, EX2021 animations of Darlington’s and Islas’ pulley as they rotate from brace to draw). The unwrapping (let-out) end of Darlington’s and Islas’ power cables are wrapped opposite the direction of cam rotation precisely because they must unwrap during the draw to synchronize the bows cams. *Id.* Similarly, the wrapping (take-up) end of Darlington’s and Islas’ power cables are wrapped in the same direction of the cam rotation precisely because they must wrap around the cam during draw to provide the archer a mechanical advantage in flexing the bows limbs. *Id.* Therefore, a POSITA would appreciate that it makes no sense to wrap Darlington’s take-up end to function like Islas’ let-out end, because the wrapping directions of each serve different functions. *Id.* Petitioner fails to account for this distinction in proposing its combination.

Petitioner compounds this error by not only applying a wrapping direction from Islas that already exists in Darlington, but also applying it to the wrong

component. As Petitioner describes Islas' power cable 31 "wraps in a first rotational direction ... around a cam element," not a capstan. Pet., 31. And, Petitioner's expert is clear that "Islas is not being used to teach a capstan." EX1003, ¶57. So that begs the question of which reference teaches a wrapping (take-up) end of a power cable that wraps in one direction around a cam and an opposite direction around a capstan, as in Petitioner's modified cam. Neither Darlington nor Islas teach this concept. And, Petitioner has not provided any evidence showing that this concept was known prior to McPherson's invention.

Simply put, the Petitioner's failure to accurately consider the "scope and content" of its asserted art is not only a failure of the first inquiry of *Graham*, it lead Petitioner to concoct a modified cam with multiple components that are completely absent from both Darlington and Islas. It is clear that Petitioner used McPherson's patent as a roadmap for its modified pulley rather than its own references. Petitioner's modifications to Darlington's pulley are legally and factually improper.

B. Petitioner fails to show that a POSITA would have been motivated to combine teachings from Islas with those of Darlington.

A legally sufficient obviousness analysis must be supported by "some articulated reasoning with some rational underpinning." *KSR Int'l Co. v. Teleflex*

Inc., 550 U.S. 398, 418 (2007). The Federal Circuit emphasized this point in *In re Nuvasive, Inc.* where the it *vacated* the PTAB’s obviousness determination for relying on conclusory assertions of obviousness. *In re Nuvasive, Inc.*, 842 F.3d 1376, 1382 (Fed. Cir. 2016). In its decision the court explained that “[t]he factual inquiry whether to combine references must be thorough and searching, and [t]he need for specificity pervades [our] authority.” *Id.*, at 1381–82 (quoting *In re Lee*, 277 F.3d 1338, 1343 (Fed. Cir. 2002)) (internal quotes omitted). The court further explained that “First, the PTAB must make the necessary findings and have an adequate evidentiary basis for its findings . . . Second, the PTAB must examine the relevant data and articulate a satisfactory explanation for its action including ***a rational connection between the facts found and the choice made.***” *Id.* at 1382 (internal quotes omitted).

Petitioner presents three reasons that a POSITA would have been motivated to make its proposed modifications to Darlington’s pulley. Pet., 36-37. But none of these reasons support reversing the wrap direction of Darlington’s power cable 30 – the **only** concept that is allegedly adopted from Islas. See Pet., 36-44; EX1003, ¶57. Rather, if anything, the alleged motivations result from Petitioner’s deconstruction of Darlington’s pulley by removing “fixed section 42.” Pet., 36-44; EX1004, col 3:48. And, several are demonstrably false.

Briefly, neither Petitioner nor its expert, explain why section 42 is removed from Darlington's pulley. Instead, both Petitioner and its expert merely dismiss section 42 as "superfluous" and "unnecessary," although this is contradicted by Dr. Reinholtz and Lange's deposition testimony. Pet., 34; EX1003, ¶¶62; EX2018, ¶¶110-140.

10 **Looking at fixed member 42, you agree**
11 **that during the draw that fixed member 42 takes up**
12 **power cable 30?**

13 A. I believe -- I believe I stated that
14 it does earlier in the deposition.

18 Q. BY MR. COLVIN: In a bow system, such
19 as the one shown in Darlington, taking up power
20 cables stores energy; right?

21 A. Yes.

22 Q. And during draw, fixed section 42

Page 91

1 **takes up power cable 30, as shown in the bottom**
2 **image of Figure 2?**

3 A. Correct.

EX2012, 89:10-14, 90:18-91:3. In fact, its removal is an essential consequence of Petitioner's attempt to reverse the wrap direction of power cable 30 on Darlington's pulley, not a justification for changing the cable wrap. EX2018, ¶¶138-139. It is self-evident that there would be no room on the pulley to move Darlington's terminal 56 (anchor) without first deconstructing the pulley and removing the "fixed section

42.” *Id.* Petitioner then creates a series of circular arguments reasoning that it is beneficial to change the cable wrap direction on Darlington’s pulley because doing “eliminates the need for section 42” and elimination of section 42 results in the previously stated benefit. *See* Pet., 32-40. As discussed below, none of Petitioner’s alleged motivations result from the change in cable wrapping direction itself.

First, Petitioner argues that safety and maintainability is improved by reducing “contact between a bow’s power cables with one another or unintended elements of the bows pulley” including “wear that naturally occurs as a cable rides in and out of a track as the bow is drawn.” Pet., 37. Petitioner does not show how the change in cable wrapping direction itself changes any contact points between the cable and other bow components. Petitioner blindly concludes that “a PHOSITA, having reviewed *Islas*, would have been motivated to modify *Darlington*’s bow to reduce the likelihood of unwanted cable contact,” but *Islas*’ cable is wrapped completely around cam 60, increasing contact rather than reducing it. Petitioner argues that changing the wrap direction of Darlington’s cable 30 and moving the terminal 56 (anchor) to the outward edge of the pulley would reduce the “likelihood of unwanted cable contact,” but does not show any risk of any cable contact from the original position of Darlington’s terminal 56 at any rotation angle. Instead, the only point in Darlington’s bow that Petitioner’s expert points out as creating any contact with the power cable is section 42 as it “rides in and out of a track”. EX1003, ¶¶59-62;

EX2012, 97:3-101:11. And Petitioner's expert revealed at deposition that the only contact his proposed combination removed was the contact of the power cable with section 42.

16 Q. BY MR. COLVIN: I'm going to take you
17 to paragraph 67 in your declaration. Oh. I'm
18 sorry. Before we go there, let me take you to 61
19 again -- I'm sorry, 62 on page 65.

20 In the -- looking at -- below the
21 figures there, the first full -- the second full
22 sentence below the figures starts with, "As

Page 117

1 mentioned above."

2 A. Yes.

3 Q. And it says, "eliminating section 42
4 would have decreased the wear, friction, and
5 potential for unwanted contact between power
6 cable 30 and other portions of the bow," and it
7 continues.

8 You see that?

9 A. I do.

10 Q. The other portions of the bow that you
11 describe there, are you talking about section 42
12 or are you talking about something else?

13 A. Section 42.

EX2012, 116:16-117:13. Thus, any alleged reduction in cable wear, and by extension safety and maintainability, is only a consequence of Petitioner's deconstruction of Darlington by removing section 42 in order to accommodate

reversing the wrap direction of cable 30, **not** the result of the reversed wrap. EX2018, ¶¶114-134.

Petitioner alleges that the simplified design of its modified pulley “would have eliminated the need for section 42, reducing the manufacturing costs.” Pet., 38. But, Petitioner’s expert **only** testifies that the simplified design reduced manufacturing costs are a result of the removal of Darlington’s section 42, and not to the outward cable wrapping it allegedly finds in Islas. See EX1003, ¶¶59-64. Petitioner’s expert explains that Darlington’s design is allegedly simplified and less costly to manufacture by eliminating section 42. “As an added benefit of the modification, the section 42 highlighted in brown in annotated Fig. 4C below would have been rendered superfluous and would have been desirably eliminated from the combined *Darlington+Islas* bow, simplifying the overall design.” Id., ¶62. And, the “elimination [of section 42] also would have resulted in reduced manufacturing cost for the design.” Id. Petitioner does not show that reversing the power cable wrapping itself would either simplify the cam design or reduce manufacturing costs.

Lastly, Petitioner does not even attempt to link the alleged increase in maximum pulley rotation to its proposed change in cable wrapping direction, but bluntly states that it results from the “elimination of section 42.” Pet., 39. Petitioner’s only reference to cable wrapping direction as increasing maximum rotation is a direct quote from the ’989 Patent. Pet., 40 (quoting EX1001, 5:15-25).

For at least these reasons, none of Petitioners three motivations support changing the power cable wrap direction on Darlington's pulley. So, Petitioner purports to modify Darlington's pulley with features that are not present in its references, and then does not rationally justify the proposed modification. For these additional reasons, Petitioner's modifications to Darlington's pulley are legally and factually improper.

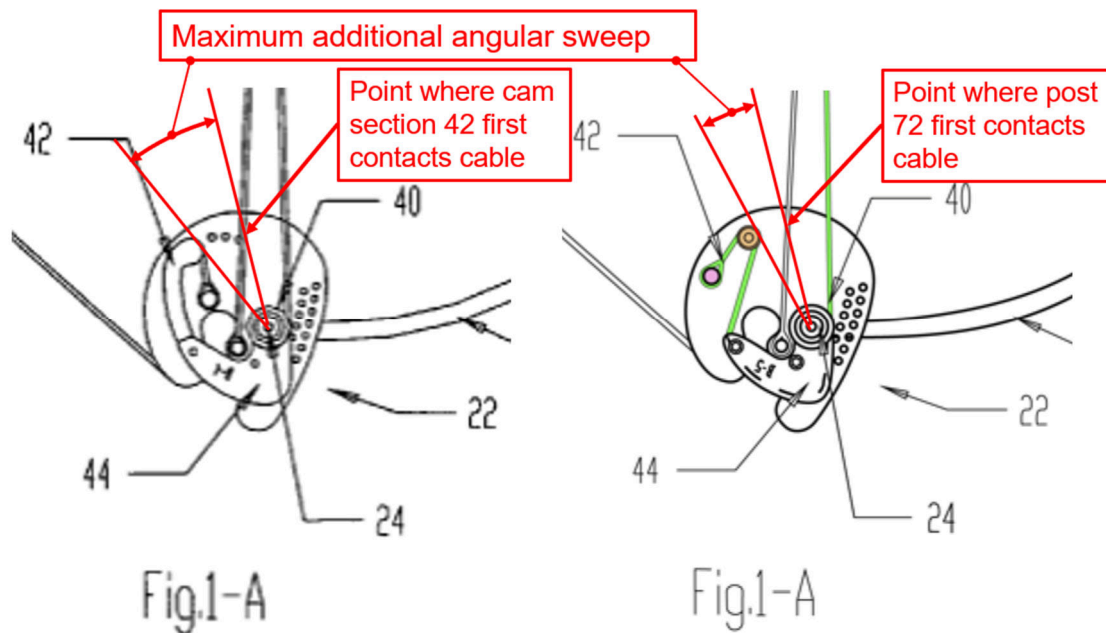
1. Petitioner's modified Darlington pulley would not increase "the maximum angular sweep the rotatable member could rotate without obstruction from brace to full-draw."

This alleged improvement is not true. EX2012, 43:17-44:16, 93:5-95:9; EX2018, ¶¶131-134 (agreeing with Lange). Petitioner and its expert have not proposed any embodiment of its modified pulley that would increase the rotational limit of the pulley beyond the original Darlington design. EX2012, 93:5-95:9; EX2018, ¶¶132-133 (agreeing with Lange).

5 **Q. In the embodiments that you've drawn**
6 **in your declaration, do those embodiments have a**
7 **higher rotational limit than the embodiments shown**
8 **in Darlington?**
9 **A. No.**

EX2012, 95:5-9. To be fair, Lange does opine that "certain embodiments" of the modified pulley might have more rotation than Darlington's original embodiments, but he was unable to articulate any such embodiments. EX2012, 93:5-95:9. Using

Petitioner's drawings, Dr. Reinholtz confirms that Petitioner's modified Pulley does not have a higher rotational limit than Darlington's pulley, but rather that the "the maximum angular sweep in Darlington." EX2018, ¶132, *see also* ¶¶131-134.

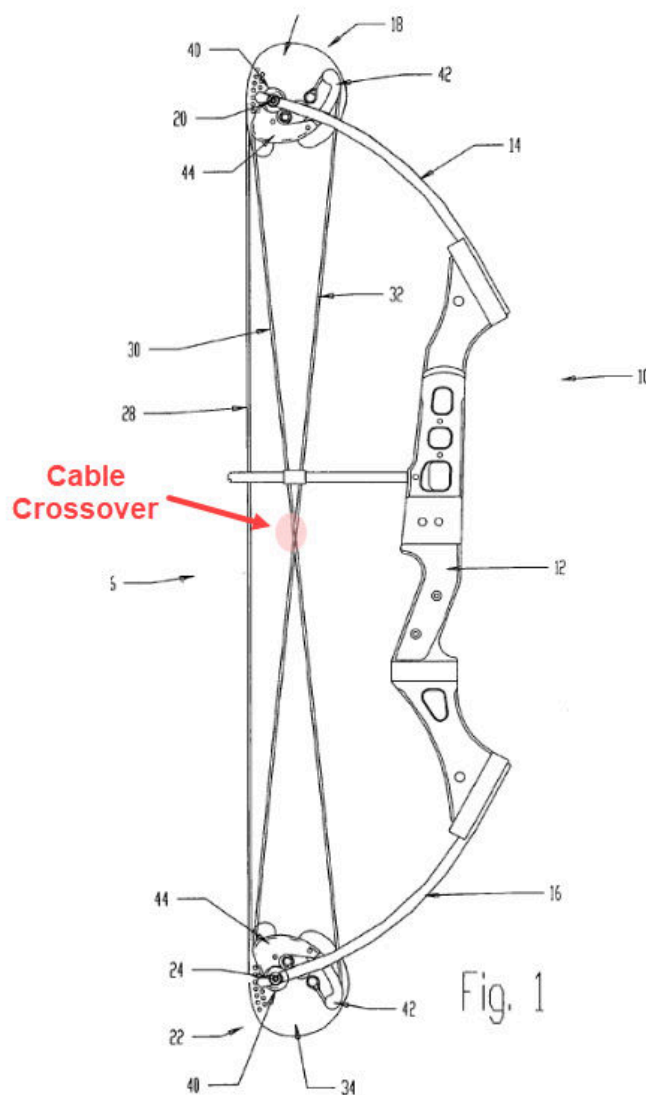


EX2018, ¶133.

2. Petitioner's modified Darlington cam would increase cable wear not reduce it.

Petitioner and its expert focus exclusively on cable wear in their attempt to show that the modified Darlington pulley "would have increased safety and maintainability" of Darlington's bow. Pet., 37-39; EX1003, ¶¶59-62. But, as discussed previously, they point only the removal of Darlington's fixed section 42 as reducing cable wear. Yet, their best supporting evidence (EX1006) does not

indicate that cable contact with cam tracks is a significant source of cable wear, but focuses on locations where cables cross (e.g., the midpoint of the bow shown below) and contact with the arrow or fletching itself. EX1006, 6:28-36, 7:4-15, 29:65-67; EX2018, ¶117; EX1003, ¶60. Petitioner does not even allege that its modified pulley addresses these wear mechanisms. See Pet., 37-39.



EX1005, Fig. 1 (annotated).

Instead, Petitioner's redesign of Darlington's pulley creates multiple potential sources of cable wear, derailment, and cable fatigue failure; all resulting from the removal of Darlington's fixed section 42. EX2018, ¶¶119-130. While Petitioner and Lange dismissed section 42 as "unnecessary" and "superfluous" Dr. Reinholtz explains that it is "essential" to minimizing cable wear and maintaining the safe operation of Darlington's bow. Pet., 34; EX1003, ¶62; EX2018, ¶¶119-130. In particular, Reinholtz explains in detail how section 42 mitigated an effect known as cam lean in Darlington's pulley and maintained the power cable within the cable groove. EX2018, ¶¶128-129. Petitioner's elimination of section 42 increases a moment arm on the pulley introducing "cam lean" and creates a gap between the power cable 30 and the cam module B-5. EX2018, ¶129. These two effects create a significant risk that cable 30 is not aligned with the cable groove in B-5 during draw and will either "rub on the side of the groove in the best case, or derail altogether in the worst case." *Id.* Reinholtz additionally explains how Petitioner's pulley design creates a risk of cable fatigue failures. EX2018, ¶¶125-127. Furthermore, removing section 42 creates an undesirable gap between the power cable and module 44 (or 64) that is expressly warned against in Darlington because it will negatively affect the feel of the bow while it is being drawn. EX1004, 2:59-65, 3:60-64.

Ultimately, Petitioner does not show that its modified pulley would reduce cable wear, improving safety, but instead, creates significant safety risks. EX2018, ¶¶119-130. Indeed, even with multiple attempts at modifying Darlington's pulley, Lange himself admitted that the designs would still require further modification.

17 Q. Do you believe it's possible that the
18 combination embodiment you've drawn in your
19 declaration puts more wear on the cable than would
20 exist in the original Darlington?

21 A. I don't have an opinion on that.
22 Scratch that.

Page 109

1 I do have an opinion on that.

2 Q. Okay. What is it?

3 A. I expect that a PHOSITA would further
4 modify the concept, presented as the modified
5 Darlington/Islas cam assembly, such that the wear
6 would be less than what is depicted in Darlington.

EX2012, 10817-109-6

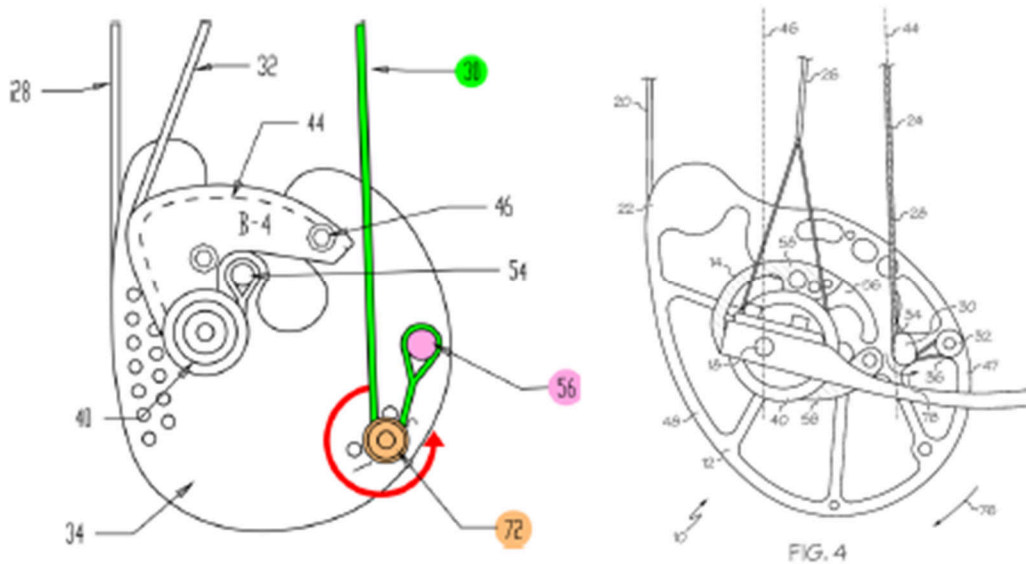
3. Petitioner's modified Darlington pulley has a multitude of design problems.

Petitioner's modifications to Darlington's pulley creates problems instead of solving them. EX2018, ¶110. In his declaration, Dr. Reinholtz provides a detailed analysis of how Petitioner's deconstruction and re-design of Darlington's pulley would result in a bow with reduced energy storage, lower arrow velocities, more

vibration, excessive cam lean, and increased safety issues (e.g., cable derailment and fatigue). EX2018, ¶¶110-140. Even after two attempts to modify Darlington’s pulley in a forced attempt to map to McPherson’s patent claims, Mr. Lange (a POSITA), was unable to avoid a multitude of problems. EX2018, ¶140; EX1003, ¶27 (Lange testifying that he met the requirements of a POSITA).

C. Darlington and Islas fails to disclose multiple limitations of the independent claims.

Without its “modified Darlington pulley” Petitioner cannot show that several limitations of the independent claims are obvious. *See, e.g.*, Pet., 30-36, 44-47, 69-73, 84-86, 91-93. For the reasons discussed in Sections IV.A-B. Petitioner’s modified pulley is based on faulty and unsupported reasoning that is at odds with §103 law, and is not supported by proper evidence that a POSITA would have been motivated to make the alleged modifications. Ultimately, the resulting modification is nothing more than a hindsight reconstruction of the ’989 Patent’s FIG. 4. *Compare* Pet., 30 (Petitioner’s annotated image of the “modified Darlington pulley”) *with* EX1001, FIG. 4 (both reproduced below); *W.L. Gore*, 721 F.2d at 1553. Therefore, Petitioner fails to show how the prior art satisfies each of the claim limitations (enumerated below) that are mapped to Petitioner’s “modified Darlington pulley” because it relies on Petitioner’s faulty and unsupported combination of Darlington and Islas.



Pet. 30, EX1001, FIG. 4

1. Independent Claim 1

Petitioner relies on its “modified Darlington pulley” to disclose the following limitations of claim 1:

Claim 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”

Claim 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.”

Pet., 30-36, 44-47. Neither Darlington nor Islas disclose these limitations without recourse to Petitioner’s hindsight based modifications.

2. Independent Claim 11

Petitioner relies on its “modified Darlington pulley” to disclose the following limitations of claim 11:

Claim 11(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”

Claim 11(g): “wherein, in the drawn condition, the capstan is located closer to the elongate straight portion [of the power cable] than the terminal.”

Pet., 69-73 (citing 30-36). Neither Darlington nor Islas disclose these limitations without recourse to Petitioner’s hindsight based modifications.

3. Independent Claim 12

Petitioner relies on its “modified Darlington pulley” to disclose the following limitations of claim 12:

Claim 12(e)(ii): “a distance between the terminal and the axle plane is greater than a distance between the capstan and the axle plane and”

Claim 12(f)(ii): “the elongate straight portion [of the power cable when in a brace condition] defines a cable portion plane, said first axle and said terminal are located on opposite sides of said cable portion plane.”

Pet., 85-87 (citing 30-36, 44-47). Neither Darlington nor Islas disclose these limitations without recourse to Petitioner’s hindsight based modifications.

4. Independent Claim 19

Petitioner relies on its “modified Darlington pulley” to disclose the following limitations of claim 19:

Claim 19(e): “a distance between the terminal and the axle plane is greater than a distance between the capstan and the axle plane and

Pet., 91 (citing 80-86). Neither Darlington nor Islas disclose this limitation without recourse to Petitioner's hindsight based modifications.

Claim 19(f)(i)-(ii): "wherein, in the drawn condition, said power cable comprises an elongate straight portion located near said first rotatable member, the capstan located closer to the elongate straight portion than the terminal."

Pet., 91-93. Neither Darlington nor Islas disclose this limitation without recourse to Petitioner's hindsight based modifications.

V. CONCLUSION

For at least the reasons discussed above, Petitioner has failed to demonstrate that any of the Challenged Claims are unpatentable.

Respectfully submitted,

Date: December 5, 2024

/Joshua A. Griswold/

Joshua A. Griswold, Reg. No. 46,310
Matthew A. Colvin, Reg. No. 66,843
Kenneth J. Hoover, Reg. No. 68,116
Kenneth Langley, Reg. No. 80,549
Fish & Richardson P.C.
60 South Sixth Street, Suite 3200
Minneapolis, MN 55402
T: 214-747-5070
F: 877-769-7945

Attorneys for Patent Owner

CERTIFICATION UNDER 37 CFR § 42.24(d)

Under the provisions of 37 CFR § 42.24(d), the undersigned hereby certifies that the word count for the foregoing Patent Owner's Preliminary Response to Petition totals 13,951, which is less than the 14,000 allowed under 37 CFR § 42.24(b)(i).

Respectfully submitted,

Date: December 5, 2024

/Joshua A. Griswold/
Joshua A. Griswold, Reg. No. 46,310
Matthew A. Colvin, Reg. No. 66,843
Kenneth J. Hoover, Reg. No. 68,116
Kenneth Langley, Reg. No. 80,549
Fish & Richardson P.C.
60 South Sixth Street, Suite 3200
Minneapolis, MN 55402
T: 214-747-5070
F: 877-769-7945

Attorneys for Patent Owner

CERTIFICATE OF SERVICE

Pursuant to 37 CFR § 42.6(e)(4) and 42.205(b), the undersigned certifies that on December 5, 2024, a complete and entire copy of this Patent Owner's Response, Motion to Seal, and accompanying exhibits were provided by email, to the Petitioner, by serving the email correspondence address of record as follows:

Adam P. Seitz, Reg. No. 52,206
Adam M. Sandwell, Reg. No. 72,484
Chris R. Schmidt, Reg. No. 63,982
Erise IP, P.A.

Adam.Seitz@eriseip.com
Adam.Sandwell@eriseip.com
Chris.Schmidt@eriseip.com
PTAB@eriseip.com

/Anastasia Renard/
Anastasia Renard
Fish & Richardson P.C.
60 South Sixth Street, Suite 3200
Minneapolis, MN 55402
renard@fr.com