Inter Partes Review

U.S. Patent No. 8,683,989
U.S. Patent No. 9,354,017
U.S. Patent No. 9,909,831

Oral Argument, June 12, 2025

Ravin Crossbows, LLC v. MCP IP, LLC
Case Nos. IPR2024-00522, -00523, -00524

Petitioner's Ground

Original Ground	Basis	Disputed Claims
Ground 1: Darlington/Islas	§ 103	('989 Patent) 1-4, 7-19 ('017 Patent) 1-6, 9-20 ('831 Patent) 1-5, 8-19

IPR2024-00522 Pet. (Paper 1), p. 4; IPR2024-00523 Pet. (Paper 1), p. 5; IPR2024-00524 Pet. (Paper 1), p. 5.

Roadmap:

1. **Summary of the Challenged Patents**
2. Darlington/Islas invalidates all Challenged Claims
3. MCP Did Not Meet Its Burden for Swear Behind

Summary of the Challenged Patents

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

a riser;

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

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 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;

a drawstring extending between the first rotatable member and the second rotatable member;

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;

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

Ex.1001, claim 1.

- Focus of the arguments is on the so-called "reverse wrap" feature

- IPR2024-00522 Pet. (Paper 1), p. 7 *et. seq.*; Ex.1001 ('989 Patent) at claim 1.

Summary of the Challenged Patents

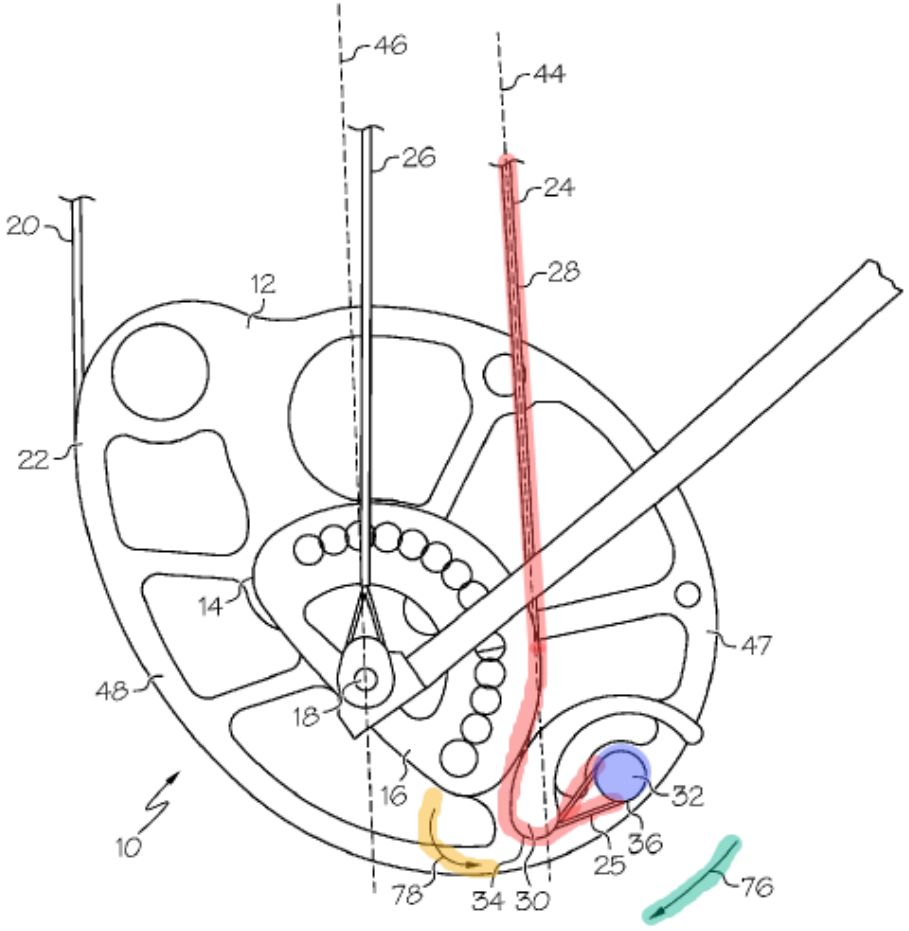


FIG. 1

- "power cable wraps around the capstan in a first rotational direction" (yellow arrow)
- "the first rotatable member rotates in a second rotational direction" (green arrow)

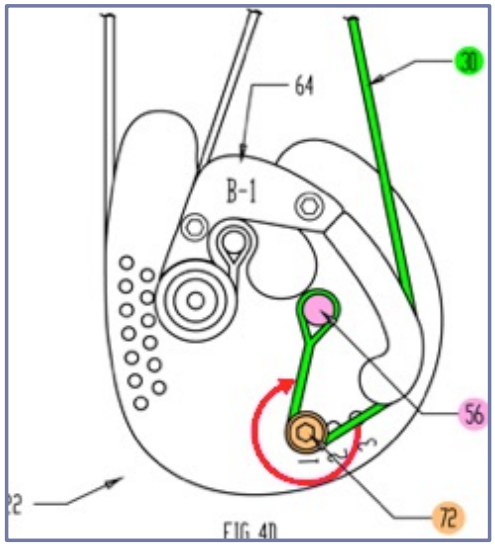
IPR2024-00522, Patent Owner Response (Paper 14), p. 4; EX1001 ('989 Patent) at Fig. 1 (annotated).

Roadmap:

1. Summary of the Challenged Patents
2. **Darlington/Islas invalidates all Challenged Claims**
3. Darlington is prior art

Patent Owner's Only Challenge to the Combination:

Whether it would have been obvious to modify Darlington's pulley based on Islas's teachings



Darlington

(Ex. 1004, Fig. 4D)

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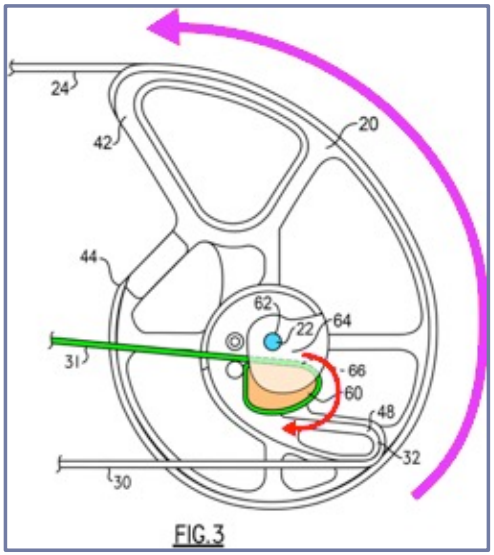

Islas

(Ex. 1005, Fig. 3)

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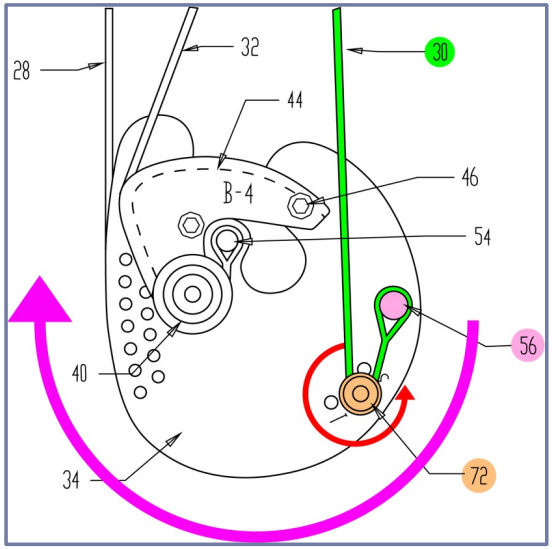


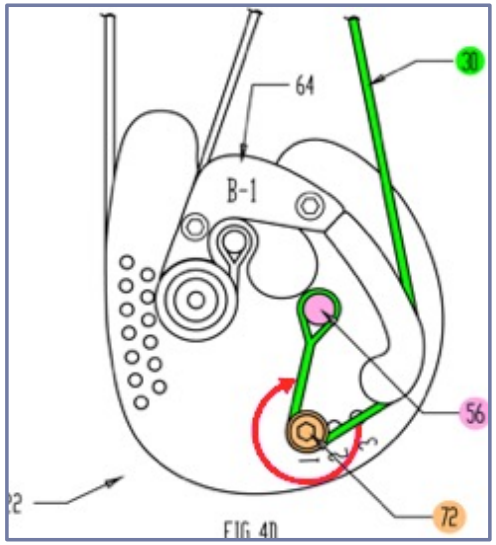
Darlington as Modified

IPR2024-00522 Pet. (Paper 1), p. 29 (annotated *Darlington* Fig. 4D) and p. 30 (annotated and modified *Darlington* Fig. 4A); IPR2024-00523 Pet. (Paper 1), p. 25-28 (same); IPR2024-00524 Pet. (Paper 1), p. 25-30 (same).

Petitioner's DX-7

Patent Owner's Only Challenge to the Combination:

No dispute that Islas teaches a power cable that wraps in a first rotational direction (31, light green) and a cam that rotates in a second rotational direction (magenta arrow)



Darlington
(Ex. 1004, Fig. 4D)

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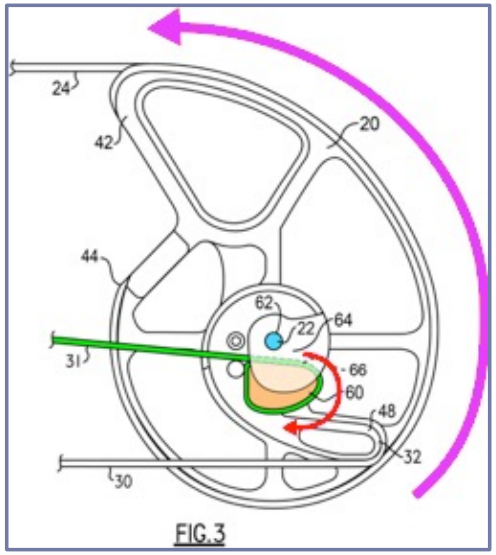

Islas
(Ex. 1005, Fig. 3)

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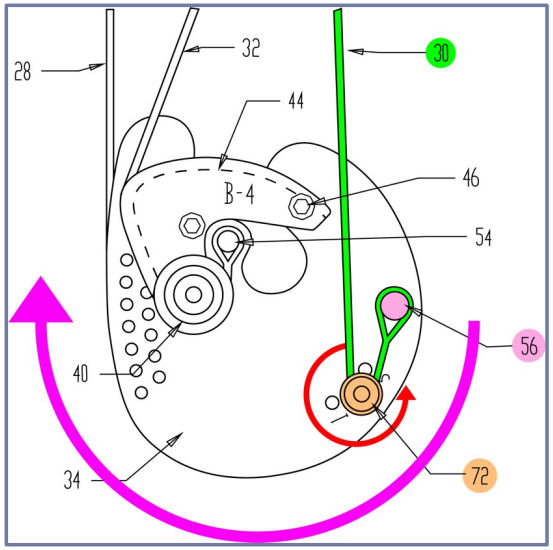


Darlington as Modified

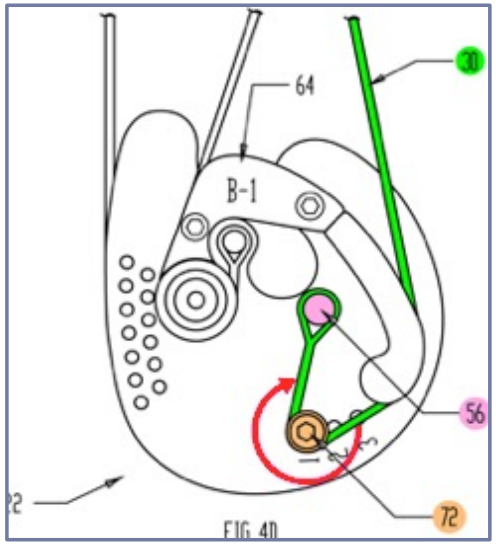
IPR2024-00522 Pet. (Paper 1), p. 29 (annotated *Darlington* Fig. 4D) and p. 30 (annotated and modified *Darlington* Fig. 4A); IPR2024-00523 Pet. (Paper 1), p. 25-28 (same); IPR2024-00524 Pet. (Paper 1), p. 25-30 (same).

Petitioner's DX-8

Practical Realities of the Combination:

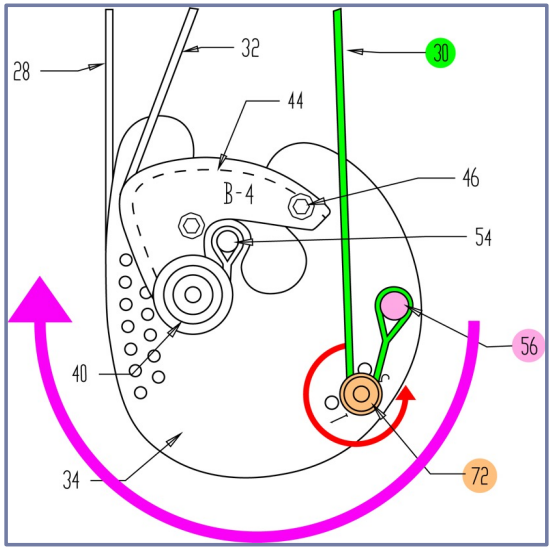
Capstan (72) / terminal (56) shift

"replaceable draw length module 44" (brown) is removed

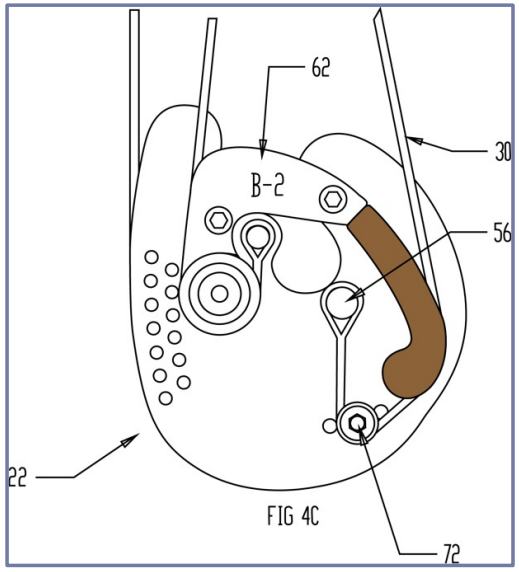


Darlington

(Ex. 1004, Fig. 4D)



Modified Bow



Darlington

(Ex. 1004, Fig. 4D)

IPR2024-00522 Pet. (Paper 1), p. 29 (annotated *Darlington* Fig. 4D) and p. 30 (annotated and modified *Darlington* Fig. 4A); IPR2024-00523 Pet. (Paper 1), p. 25-28 (same); IPR2024-00524 Pet. (Paper 1), p. 25-30 (same).

Petitioner's DX-9

Practical Realities of the Combination:

Why capstan (72) / terminal (56) shift

> Notably, *Darlington* explains that intermediate post 72 is "adjustably positionable" to configure the stresses in the limbs during draw. *Darlington*, 3:35-4:20; *Dec.*, 58.
>
> IPR2024-00522, Paper 1, p. 40.

> Incorporating *Islas's* cutouts into *Darlington's* pulley reduces available placements for the power cable's terminal. A PHOSITA would have recognized the terminal cannot be placed on a void of the cutout, limiting the possible terminal placement locations to one of a finite number of identifiable, predictable options, including the center structure of the cam, the spokes, or the outer peripheral structure. *Dec.*, 72.
>
> IPR2024-00522, Paper 1, p. 68.

- IPR2024-00522 Pet. (Paper 1), p. 29, 36-34, 68; IPR2024-00523 Pet. (Paper 1), p. 40-41; IPR2024-00524 Pet. (Paper 1), p. 25, 32-40.

Practical Realities of the Combination:

Why module 44 is removed

> Similarly, as discussed above, *Darlington* expressly teaches that portions of its removable draw length module (e.g. draw length module 44 and section 42) are intended to be removable (e.g., via screws) and "replaceable" with components of alternative shapes corresponding to any desired draw cycle. *Darlington*, 3:38-4:20 (*pinpoint* at 3:60-64 describing elements 60,62,64 of Figs. 3A-D corresponding to element 44 of Fig. 2), 1:32-38, 2:50-65, 4:7-20, Figs. 2-5C; *Dec.,* 58.

IPR2024-00522, Paper 1, p. 41.

IPR2024-00522 Pet. (Paper 1), p. 41; IPR2024-00523 Pet. (Paper 1), p. 40-41; IPR2024-00524 Pet. (Paper 1), p. 37. Petitioner's DX-11

Practical Realities of the Combination:

POSITA support for why module 44 is removed

Thus, a PHOSITA would have been capable and motivated to produce alternative draw length modules for facilitating the modification of *Darlington's* design based on *Islas* and would have merely needed to unscrew the original module and attach the new module to modify the design. Similarly, removing the section 42 would have desirably reduced the weight of the cam, decreasing its manufacturing cost, the effort needed to carry the bow and hold it away from the archer's body, and increasing the fraction of rotational energy being imparted to a fired arrow. To the extent it would have been necessary to modify the design further, such as by changing the number, type, or location of the fasteners (and corresponding holes into which the fasteners enter), a PHOSITA would have had the skills necessary to do so, without undue experimentation, leading to a reasonable expectation of success for the combination. Ex. 1003, ¶58.

- IPR2024-00522 Pet. (Paper 1), p. 29, 36-34, 68; IPR2024-00523 Pet. (Paper 1), p. 35-36; IPR2024-00524 Pet. (Paper 1), p. 38-39.

Petitioner's DX-12

Why Modify Darlington?

1. Improving safety and maintainability

- Contact between power cables and other bow elements is undesirable (entanglement, abrasion, fraying). Ex. 1003, ¶¶ 59-64; Paper 1, p. 37-38
- Cable wear can cause user injury and cable failure. *Id.*
- Wear naturally occurs as a cable rides in a track. Ex.1003, ¶ 59.
- Contact can reduce arrow force, accuracy, range, and lethality of the bow. Ex.1003, ¶ 59-61.
- Cable wear requires cable replacement, increasing maintenance costs. *Id.*

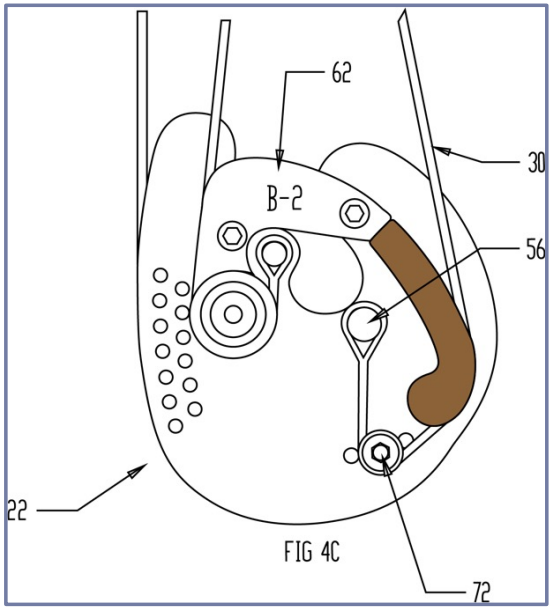
IPR2024-00522, Petition (Paper 1) at 36-44; IPR2024-00522, Petition (Paper 1) at 35-43; IPR2024-00522, Petition (Paper 1) at 32-40; Lange Declaration (Ex. 1003) at ¶¶ 55-64.

Why Modify Darlington?

2. Simpler design with reduced manufacturing costs

- Sections 42 and 44 of Darlington are *designed* to be removable

  Ex. 1004, 3:38-4:20



Darlington

(Ex. 1004, Fig. 4D)

IPR2024-00522, Petition (Paper 1) at 36-44; IPR2024-00522, Petition (Paper 1) at 35-43; IPR2024-00522, Petition (Paper 1) at 32-40; Lange Declaration (Ex. 1003) at ¶¶ 55-64.

Why Modify Darlington?

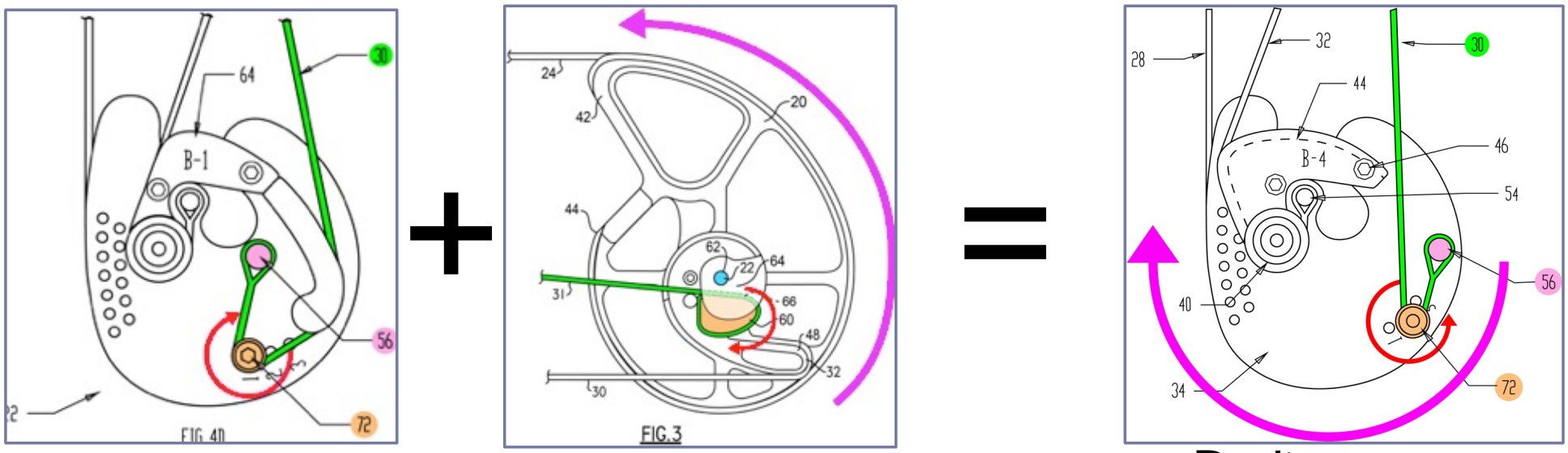
3. **Increased maximum rotation of pulley & increased arrow velocity**

> The rotational limit of the original *Darlington* design would have been overcome by wrapping the power cable the opposite direction, towards the edge of the pulley, getting the end of the power cable and the terminal out of the way of the rotation of the pulley. For a given cam size, this would have resulted in a larger amount of force being imparted to a fired arrow, which was highly desirable in the market for both consumers and bow manufacturers. Ex. 1003, ¶63.

IPR2024-00522, Petition (Paper 1) at 36-44; IPR2024-00522, Petition (Paper 1) at 35-43; IPR2024-00522, Petition (Paper 1) at 32-40; Lange Declaration (Ex. 1003) at ¶¶ 55-64.

Patent Owner's Sur-Reply:

Patent Owner improperly focuses on the direction the power cable wraps in isolation (i.e. clockwise or counterclockwise)



Darlington
(Ex. 1004, Fig. 4D)

Islas
(Ex. 1005, Fig. 3)

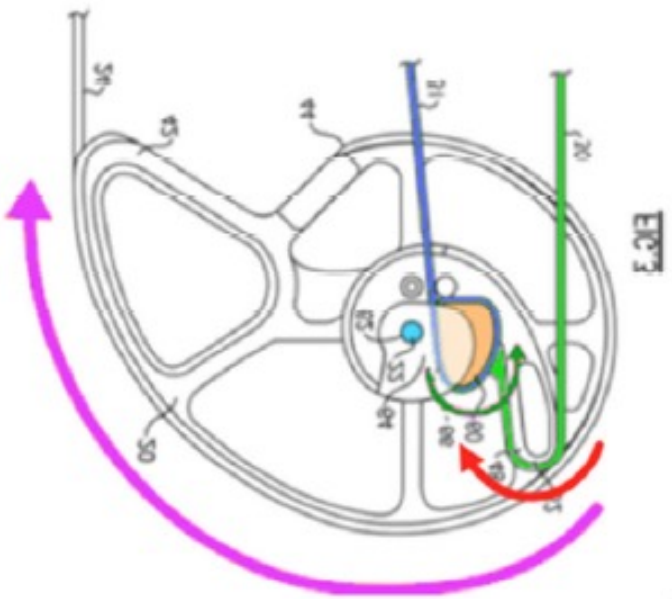
Darlington as Modified

- IPR2024-00522, Sur-reply (Paper 28) at 41 (there is no reason to apply Islas' **wrap direction** to Darlington") Petitioner's DX-16 (emphasis added).

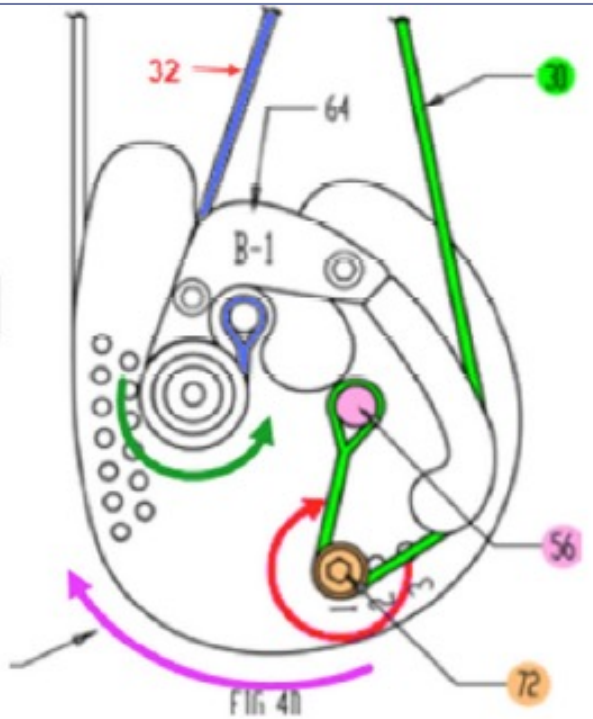
Patent Owner's Sur-Reply

Patent Owner focuses on a combination not in the Petition

Islas and Darlington viewed in combination teach the same cable wrapping directions



EX1005, FIG. 3



EX1004, FIG. 4D

Sur-Reply at 43.

Patent Owner's Challenges to the Modification

As seen in the first exemplary modified pulley below, the *Darlington* bow's anchor 56 is modified as taught by *Islas* such that its power cable wraps outwardly around the capstan 72, (counterclockwise from the illustrated perspective, away from the axis and toward the pulley's periphery).

IPR2024-00522 Petition, 33.

For these reasons, a PHOSITA, having reviewed *Islas*, would have been motivated to modify *Darlington's* bow to reduce the likelihood of unwanted cable contact, simplifying its design by wrapping its power cable *outwards* around its capstan (intermediate post 72). *Dec.*, 55-64.

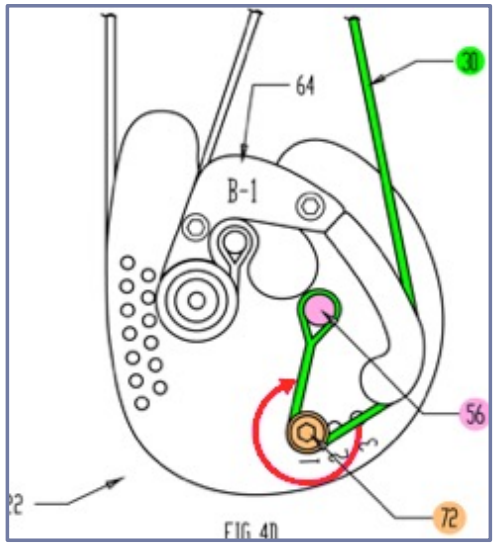
IPR2024-00522 Petition, 38.

IPR2024-00522, Petition (Paper 1), p. 33, 38; IPR2024-00522, Petition (Paper 1) at 28, 37; IPR2024-00522, Petition (Paper 1) at 29, 34;

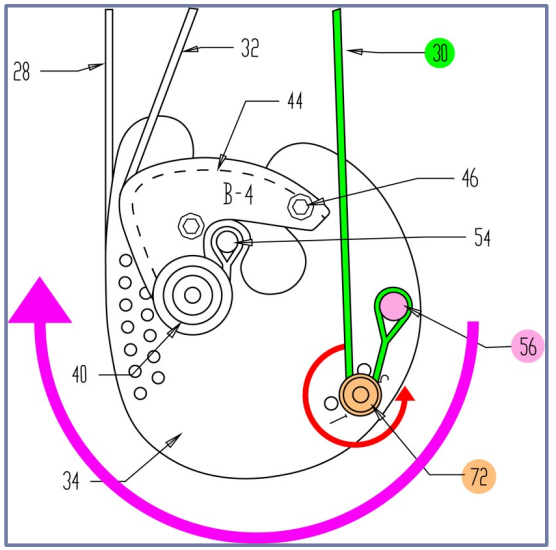
Patent Owner's Four Challenges to the Modification

- [1] Whether, in the combination, the anchor point would be near the periphery of the pulley

(PO Response (Paper 13) at p. 85-89)



Darlington
(Ex. 1004, Fig. 4D)



Darlington as Modified

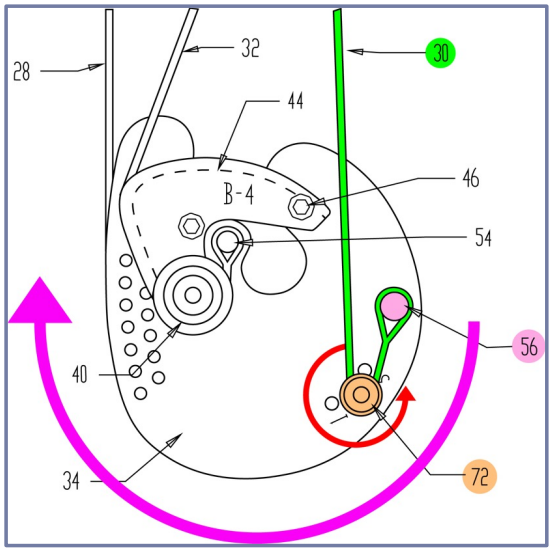
IPR2024-00522, Patent Owner Response (Paper 13) at 85-89; IPR2024-00522, Petitioner's Reply (Paper 25) at 19-20.

Petitioner's DX-19

Patent Owner's Four Challenges to the Modification

- [2] Whether a single prior art reference must show two power cables wrapping the same direction

(PO Response (Paper 13) at p. 89-91)



Darlington as Modified

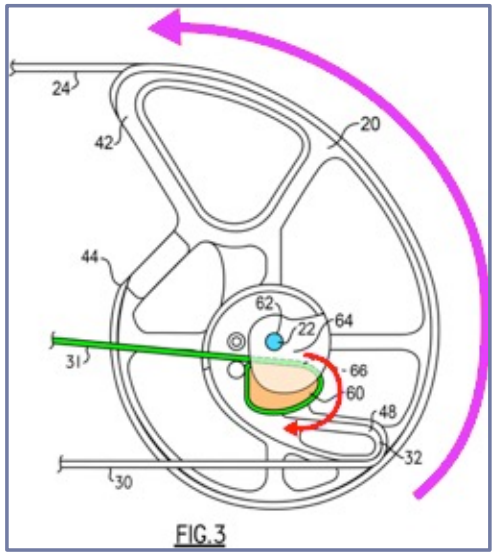
- PO fails to tie its argument to claim requirements
- PO ignores the obviousness combination in the Petition

IPR2024-00522, Patent Owner Response (Paper 13) at 85-89; IPR2024-00522, Petitioner's Reply (Paper 25) at 16-17

Patent Owner's Challenges to the Modification

- [3] Whether modifications to a power cable "let out end" apply to a power cable "take up end"

(PO Response (Paper 13) at p. 92-96)



Islas

(Ex. 1005, Fig. 3)

- The function of the let-out end is unmodified
- PO's expert admits each of the power cables performs the same function (EX1019, 33:8-43:5)

IPR2024-00522, Patent Owner Response (Paper 13) at 92-96; IPR2024-00522, Petitioner's Reply (Paper 25) at 18-19.

Patent Owner's Challenges to the Modification

- [4] Whether the combination requires Islas to teach, (pre-combination), a power cable wrapping around a *capstan* in an opposite direction

(PO Response (Paper 13) at p. 96-97)

> [0030]. Though the purposes of the second power cam member 60 and the '989's capstan are not identical, *Islas* is not being used to teach a capstan – *Darlington's* intermediate post 72 already teaches the required capstan. Rather, the concept of *Islas's* power cable wrapping around a fixed point as it extends towards an opposite rotatable member in a direction opposite the direction its pulleys rotate when drawn is being combined into *Darlington's* bow for advantages that will be articulated below.
>
> Ex. 1003, ¶57.

- IPR2024-00522, Patent Owner Response (Paper 13) at 92-96; IPR2024-00522, Petitioner's Reply (Paper 25) at 18-19; Ex. 1003, ¶57

Petitioner's DX-22

Patent Owner's Challenges to the Modification

- [4] Whether the combination requires Islas to teach, (pre-combination), a power cable wrapping around a *capstan* in an opposite direction

(PO Response (Paper 13) at p. 96-97)

The answer is no, as a matter of law:

"The test for obvious is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference[.]

Allied Erecting & Dismantling Co., Inc. v. Genesis Attachments, LLC, 825 F.3d 1373, 1381 (Fed. Cir. 2016)

Where a validity challenge is based on a combination of references, arguments that "attack the disclosures of the two references individually" lack merit.

Bradium Techs. LLC v. Iancu, 923 F.3d 1032, 1050 (Fed. Cir. 2019)

Darlington/Islas Invalidates all Challenged Claims

- Patent Owner offers no separate challenge to specific claim limitations, simply listing claim limitations that rely on the modified Darlington Pulley

'989 Patent	Claims1(f), 1(g),11(f), 12(e)(ii), 12(f)(ii),19(e), and19(f)(i)-(ii)
'017 Patent	Claims1(e), 1(f), 12(e)(ii),
'831 Patent	Claims 1(d)(ii)-(e), 1(f), 11(e)(i)-(ii)

- If the Board agrees the modified Darlington Pulley would have been obvious, these arguments are moot.

IPR2024-00522, Patent Owner Response (Paper 13) at 108-110; IPR2024-00523, Patent Owner Response (Paper 13) at 108-110; IPR2024-00524, Patent Owner Response (Paper 13) at 101-103;

Roadmap:

1. Summary of the Challenged Patents
2. Darlington/Islas invalidates all Challenged Claims
3. **MCP Failed to Meet Its Swear-Behind Burden**

The Swear-Behind Evidence:

- The Magazines
- The Inventor, Mr. McPherson
- The Sales Records
- The Physical Bows

MCP Bears the Burden

Legal Standard:

The Patent Owner has "the burden of going forward with evidence either that the prior art does not actually anticipate, or…that it is not prior art"

Dynamic Drinkware, LLC v. Nat'l Graphics, Inc., 800 F.3d 1375, 1379 (Fed. Cir. 2015)

Patent Owner's Evidence:

- The Inventor, Mr. McPherson
- The Magazines
- VP of Manufacturing, Mr. Hoff
- The Physical Bows

IPR2024-00522, Reply (Paper 25) at 4; IPR2024-00523, Reply (Paper 25) at 4; IPR2024-00524, Reply (Paper 25) at 4.

The Inventor's Testimony

Patent Owner Now Claims:

"Mr. McPherson's testimony **merely provides context** to the narrative around the conception and reduction to practice, and **is not itself relied on in any substantial way** by the POR"

Sur-Reply (Paper 28) at 5 (emphasis added).

IPR2024-00522, Sur-Reply (Paper 28) at 5; IPR2024-00523, Sur-Reply (Paper 28) at 5; IPR2024-00524, Sur-Reply (Paper 28) at 5.

The Inventor's Testimony

Were the Patent Figures based on CAD drawings for ***in-production*** Mission Menace and Mathews Monster Bows?

POR, 8.

Credibility concerns:

1. Mr. McPherson didn't send the CAD drawings to the patent attorney

   Ex.1017 at 29:6-15

2. Mr. McPherson couldn't tie the CAD drawings to the final ***in-production*** bows

   Ex.1017 at 28:4-28:10

IPR2024-00522, Reply (Paper 25) at 7-8; IPR2024-00523, Reply (Paper 25) at 7-8; IPR2024-00524, Reply (Paper 25) at 7-8.

The Magazines:
Inside Archery Dec. 2008

- Patent Owner's burden:
  - The Mission Menace met all limitations of the claims
  - The Mission Menace has the claimed orientations ***in the drawn*** condition and ***in the brace condition***

    See e.g., '989 Claim 1(f).

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.

Ex.2002 at 2.

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Ex.2002 at 2.

- IPR2024-00522, Reply (Paper 25) at 5-6; IPR2024-00523, Reply (Paper 25) at 5-6; IPR2024-00524, Reply (Paper 25) at 5-6.

Petitioner's DX-29

The Magazines:
Inside Archery Dec. 2008

The 2009 *Inside Archery* article "fails to show the Monster bow in a drawn condition." *Reply*, 6.

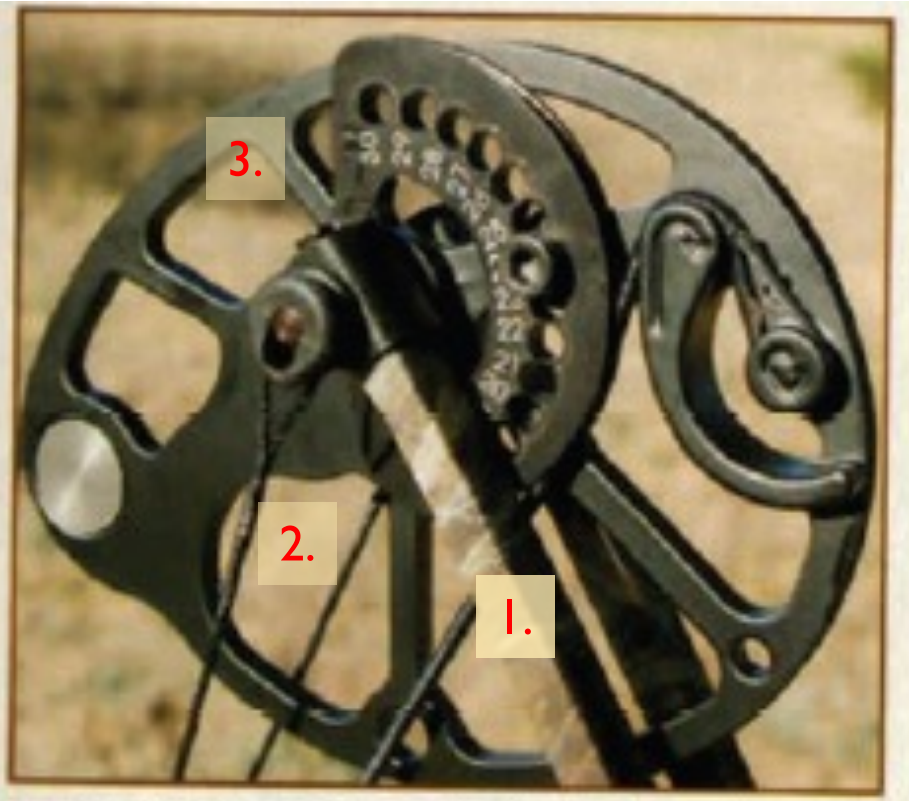
The 2CPW Two-Cam System on the Mission Menace features easy-adjust pivoting draw-length modules. Note the beefy module-locking screw. That screw won't strip out no matter how many times this bow is adjusted.

Patent Owner's response: "This alleged deficiency is irrelevant."

Sur-Reply, 19.

IPR2024-00522, Reply (Paper 25) at 6; IPR2024-00523, Reply (Paper 25) at 6; IPR2024-00524, Reply (Paper 25) at 6; IPR2024-00522, Sur-reply (Paper 28) at 19; IPR2024-00523, Sur-reply (Paper 28) at 19; IPR2024-00524, Sur-reply (Paper 28) at 19;

The Magazines:
Inside Archery Dec. 2008



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.

Ex.2002 at 2.

Is the Mission Menace in a brace condition?

Patent Owner relies on:

1. "flexed" or "unflexed limb"
2. "tight" or "loose" power cables
3. Cam rotation

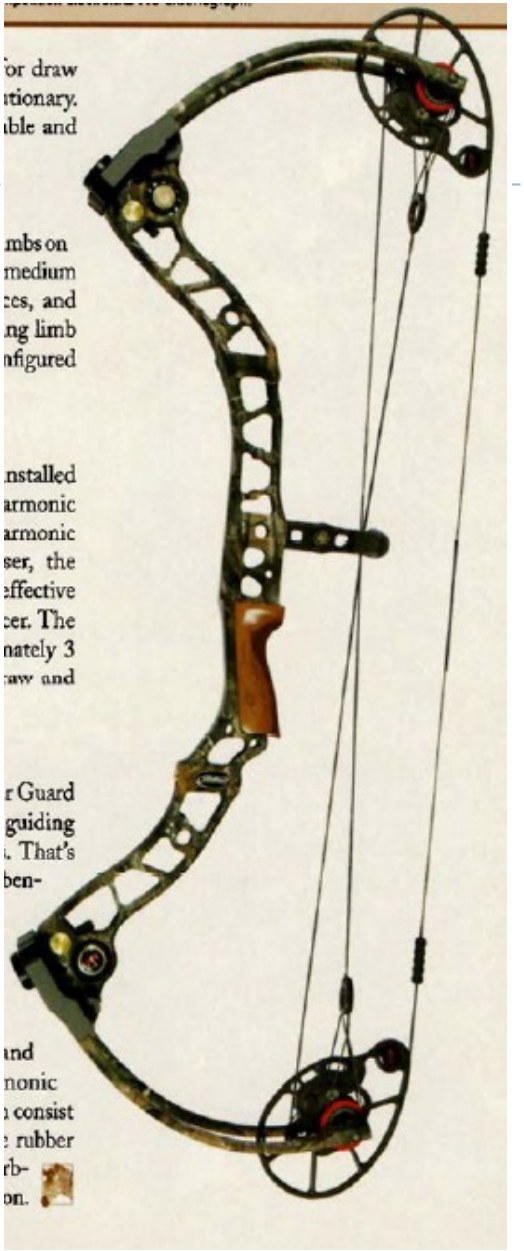
Ex.2018, ¶50, POR, 36.

- IPR2024-00522, Patent Owner Response (Paper 13) at 36; IPR2024-00523, Patent Owner Response (Paper 13) at 36; IPR2024-00524, Patent Owner Response (Paper 13) at 36; Ex.2018, ¶50.

The Magazines: *Inside Archery* June 2009

- Same Problems

Ex.2003 at 1.



Ex.2003 at 2.

IPR2024-00522, Reply (Paper 25) at 4-6; IPR2024-00523, Reply (Paper 25) at 4-6; IPR2024-00524, Reply (Paper 25) at 4-6.

The Sales Records

- Either the records are credible or they are not – Patent Owner does not get to pick and choose.

- The Board "is entitled to weigh the credibility of the witnesses and to evaluate their assertions accordingly."

  Trustees of Columbia Univ. in the City of New York v. Illumina, Inc., 620 F. App'x 916, 922 (Fed. Cir. 2015).

- "Determining the weight and credibility of the evidence is the special province of the trier of fact."

  Inwood Labs., Inc. v. Ives Labs., Inc., 456 U.S. 844, 856 (1982).

IPR2024-00522, Reply (Paper 25) at 15; IPR2024-00523, Reply (Paper 25) at 15; IPR2024-00524, Reply (Paper 25) at 15.

Sales: Patent Owner's Initial Positions

- In this proceeding:

> 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.

Patent Owner Response (Paper 13) at 7.

- Before the Trademark Office:

FIRST USE ANYWHERE DATE	09/26/2008
FIRST USE IN COMMERCE DATE	09/26/2008

EX1018 at 1.

- IPR2024-00522, Reply (Paper 25) at 12; IPR2024-00523, Reply (Paper 25) at 12; IPR2024-00524, Reply (Paper 25) at 12.

Sales: Patent Owner's Initial Positions:

- In the sales records

Sales Order #	SOMAST Identity_ Column	Sales Order Line #	SOITEM identity_ column	Custome r #	Retailer Name	Order Date	Serial Number	SYCSWON identity_ column	Serial Number Shipper #	Serial Number Shipper Line #	Part #	Part Description	Shipper #	SHMAST identity_ column	Shipper Line #	SHITEM identity _column	Shipper Sales Order Key	Shipped Date	Invoice #	ARMAST identity_ column	Invoice Line #	ARITEM identity_ column	Invoice Ship Key	Invoice Date
[redacted]				[redacted]	[redacted]							MENACE LOST AT RH	[redacted]					9/26/2008	[redacted]					
				[redacted]								MENACE LOST AT RH						9/26/2008						

EX1016, Appx A
EX2016, Appx A.

- In Hoff's Declaration

> 12. Appendix A to my declaration is an excel spreadsheet listing 12,110 Mission Menace bows that were produced and shipped by Mathews Archery between September 26, 2008 and June 29, 2009.

EX1016, ¶12
EX2016, ¶12.

- IPR2024-00522, Reply (Paper 25) at 12; IPR2024-00523, Reply (Paper 25) at 12; IPR2024-00524, Reply (Paper 25) at 12.

Patent Owner Reverses Course:

- The Patent Owner Response:

> 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.

Patent Owner Response (Paper 13) at 7.

- New claims:
  - "Shipped" doesn't mean the bow was sent anywhere

    Ex.1016, 14:5-11, 29:5-14.
  - No customer received a bow on September 26, 2008

    Ex.1017, 37:19-22.
  - First sale was October 1, 2008

    Ex.1017, 38:19-39:4.

IPR2024-00522, Reply (Paper 25) at 13-14; IPR2024-00523, Reply (Paper 25) at 13-14; IPR2024-00524, Reply (Paper 25) at 13-14.

Patent Owner Reverses Course:

- Trademark Office Sworn Statement:

FIRST USE ANYWHERE DATE	09/26/2008
FIRST USE IN COMMERCE DATE	09/26/2008

EX1018 at 1.

- Now:
  - No defense and no explanation

IPR2024-00522, Reply (Paper 25) at 13-14; IPR2024-00523, Reply (Paper 25) at 13-14; IPR2024-00524, Reply (Paper 25) at 13-14; IPR2024-00522, Sur-reply (Paper 28) at 38-39; IPR2024-00523, Sur-reply (Paper 28) at 38-39; IPR2024-00524, Sur-reply (Paper 28) at 38-39.

Do the Bows Meet the Limitations?

- Patent Owner's Shifting Positions:

> The reduction to practice of the claims of U.S. Patent 9,354,017 occurred no later than the '017 patent's earliest effective filing date of September 30, 2009.
>
> Ex.2009, p.10.

> MCP is currently seeking confirmation regarding the first date of such prototype bows, but a demonstration model of the 2009 Mission Menace was shipped to Bill Krenz of Bow Report in the last quarter of 2008.
>
> Ex.2009, p.10.

IPR2024-00522, Patent Owner Preliminary Response (Paper 6), p. 8.

Petitioner's DX-38