

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HUNTER'S MANUFACTURING COMPANY, INC. d/b/a
TENPOINT CROSSBOW TECHNOLOGIES,

Petitioner,

v.

RAVIN CROSSBOWS, LLC,

Patent Owner.

IPR2023-00407
Patent 9,354,015

**PATENT OWNER'S RESPONSE
PURSUANT TO 37 C.F.R. §42.120**

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CERTIFICATE OF COMPLIANCE

CERTIFICATE OF SERVICE

TABLE OF EXHIBITS

Exhibit No.	Exhibit
2001	Declaration in Support of Motion for <i>Pro Hac Vice</i> Admission of Kadie M. Jelenchick
2002	Declaration in Support of Motion for <i>Pro Hac Vice</i> Admission of Michelle A. Moran
2003	Scheduling Order, <i>Ravin Crossbows, LLC v. Hunter's Mfg. Co., Inc.</i> , Case No. 2:21-cv-02213-GMN-EJY, Dkt. 36 (D. Nev.)
2004	Case Transfer Confirmation, <i>Ravin Crossbows, LLC v. Hunter's Mfg. Co., Inc.</i> , Case No. 2:21-cv-02213-GMN-EJY, Dkt. 77 (D. Nev.)
2005	Animation of Figure 12 of U.S. Patent No. 9,354,015
2006	Joint Claim Construction Chart, <i>Ravin Crossbows, LLC v. Hunter's Mfg. Co., Inc.</i> , Case No. 2:21-cv-02213-GMN-EJY, Dkt. 47-1 (D. Nev.)
2007	Complaint, <i>Ravin Crossbows, LLC v. Hunter's Mfg. Co., Inc.</i> , Case No. 2:21-cv-02213-GMN-EJY, Dkt. 1 (D. Nev.)
2008	Patent Owner's Supplemental Rule 26(a) Disclosures served March 10, 2023, <i>Ravin Crossbows, LLC v. Hunter's Mfg. Co., Inc.</i> , Case No. 2:21-cv-02213-GMN-EJY (D. Nev.)
2009	Patent Owner's Amended and Supplemental Infringement Contentions served February 3, 2023, <i>Ravin Crossbows, LLC v. Hunter's Mfg. Co., Inc.</i> , Case No. 2:21-cv-02213-GMN-EJY (D. Nev.)

Exhibit No.	Exhibit
2010	Excerpt from U.S. District Courts – National Judicial Caseload Profile, through December 2022, including time to trial statistics for Northern District of Ohio (also available at https://www.uscourts.gov/sites/default/files/data_tables/fcms_na_distprofile1231.2022.pdf)
2011	Time to Trial Statistics for the Northern District of Ohio, LexMachina.com
2012	Patent Owner's Preliminary Infringement Contentions served May 23, 2022, <i>Ravin Crossbows, LLC v. Hunter's Mfg. Co., Inc.</i> , Case No. 2:21-cv-02213-GMN-EJY (D. Nev.)
2013	Petitioner's Initial Invalidity Contentions served July 7, 2022, <i>Ravin Crossbows, LLC v. Hunter's Mfg. Co., Inc.</i> , Case No. 2:21-cv-02213-GMN-EJY (D. Nev.)
2014	Redacted Patent Owner's Opposition to Petitioner's Motion to Stay Case filed May 19, 2023, <i>Ravin Crossbows, LLC v. Hunter's Mfg. Co., Inc.</i> , Case No. 5:23-cv-00598, Dkt. 88 (N.D. Ohio)
2015	Patent Owner's Motion for Leave to File Sur-Reply, filed May 31, 2023, <i>Ravin Crossbows, LLC v. Hunter's Mfg. Co., Inc.</i> , Case No. 5:23-cv-00598, Dkt. 92 (N.D. Ohio)
2016	Patent Owner's Sur-Reply, filed May 31, 2023, <i>Ravin Crossbows, LLC v. Hunter's Mfg. Co., Inc.</i> , Case No. 5:23-cv-00598, Dkt. 92-1 (N.D. Ohio)
2017	Case Management Notice, filed April 11, 2023, <i>Ravin Crossbows, LLC v. Hunter's Mfg. Co., Inc.</i> , Case No. 5:23-cv-00598, Dkt. 83 (N.D. Ohio)
2018	Draft Joint Report of Parties' Planning Meeting for Case Management Conference, dated May 17, 2023

Exhibit No.	Exhibit
2019	Order Denying Defendant's Motion to Defer Deadline for Responsive Pleading, <i>Ravin Crossbows, LLC v. Hunter's Mfg. Co., Inc.</i> , Case No. 2:21-cv-02213-GMN-EJY, Dkt. 30 (D. Nev. May 31, 2022)
2020	Scheduling Order, <i>Ravin Crossbows, LLC v. Hunter's Mfg. Co., Inc.</i> , Case No. 2:21-cv-02213-GMN-EJY, Dkt.36 (D. Nev.)
2021	Exhibit from August 24, 2023 Deposition of Stephen A. Batzer: Batzer POSA Credentials
2022	Exhibit from August 24, 2023 Deposition of Stephen A. Batzer: Screen printout from www.batzerengineering.com/untitled1.html
2023	Exhibit from August 24, 2023 Deposition of Stephen A. Batzer: Screen printout from www.batzerengineering.com/index.html
2024	Exhibit from August 24, 2023 Deposition of Stephen A. Batzer: annotated pages from WO 2011/141771, Stanziale '771, showing Figures 11-14
2025	July 25, 2023 Email String Between Counsel
2026	August 23, 2023 Email String Between Counsel
2027	Excerpts from the Transcript of the August 24, 2023 Deposition of Stephen A. Batzer
2028	August 24, 2023 Email String Between Counsel
2029	Expert Declaration of Jonathan Teater
2030	Transcript of the October 11, 2023 Deposition of Stephen A. Batzer

Exhibit No.	Exhibit
2031	Copy of an article titled: "Untunable Bow? Nock Travel Could be Your Problem," downloaded from: https://www.bowhuntingmag.com/editorial/untunable-bow-nock-travel-could-be-your-problem/382681
2032	<i>Reserved</i>
2033	Errata for October 11, 2023 Deposition of Stephen A. Batzer
2034	Curriculum Vitae of Jonathan Teater

Pursuant to 37 C.F.R. §42.120 Patent Owner submits this Response to the Petition for *Inter Partes* Review challenging Claim 1 of U.S. Patent No. 9,354,015 (“the ’015 Patent”). Patent Owner submits the Declaration of Jonathan Teater (EX2029) in support of this Response.

I. OVERVIEW

A. U.S. Patent No. 9,354,015

The ’015 Patent, titled “String Guide System for a Bow,” issued from Application No. 14/107,058, filed on December 16, 2013. EX1001, 1. The ’015 Patent does not claim priority to any other patent application. December 16, 2013 is the earliest filing date. *Id.*

The ’015 Patent is directed to:

A string guide for a bow having a reverse draw configuration with a draw string located adjacent a down-range side of the bow in a released configuration. First and second string guides rotate around first and second axes, respectively, as the draw string is displaced from the released configuration to the drawn configuration. A first power cable take-up journal on the first string guide rotates around the first axis to take up a power cable. The first power cable take-up journal includes a width measured along the first axis at least twice a width of the first power cable. The first power cable is biased away from at least the draw string. The first power cable is translated along

the first power cable take-up journal as the bow is drawn from the released configuration to the drawn configuration.

EX1001, Abstract. The '015 Patent's crossbow design provided a significant advancement in the field with an elegant, simplified design. EX2029, ¶27. The design disclosed in Claim 1 of the '015 Patent utilizes features integrated within a cam such as string guides and take-up journals which move in opposing directions to synchronize movement. *Id.* This allows for large degrees of rotations based on the length and guidance of the take-up journals with less cabling features that increase the functionality of the cam system without overcomplicating the overall design of the crossbow. *Id.* The cam system's rotation and movement in combination with the limbs create a high degree of rotation, pulling the cams close to each other creating a compact design when the bow is in the drawn position. *Id.*

B. Crossbow Technology Prior to the '015 Patent

Crossbow designs prior to the crossbow design disclosed in Claim 1 of the '015 Patent included complicated constructions such that numerous components were integrated to create mechanical advantages for the archer. EX2029, ¶28. For example, these complicated designs included multiple features such as pulleys mounted to various components (i.e., risers, barrels, limbs) creating various cabling arrangements. *Id.*

Prior to the '015 Patent, reverse draw crossbow configurations did not emphasize the importance of the narrow configuration disclosed in Claim 1 of the '015 Patent, nor did such predecessor designs include timing features allowing for multiple degrees of cam rotation near or beyond 270 degrees. *Id.* The compact cam configurations disclosed in the '015 Patent permit better and more desirable handling and usage afield. *Id.*

Designs prior to the '015 Patent also used power cabling that either connected to the limb's axles or to anchor points on the limbs to control the cam and its timing. *Id.* Such configurations supported an increase in limb deflection (and therefore greater energy storage) in an attempt to reduce the crossbow's width. *Id.* In contrast, Claim 1 of the '015 Patent does not utilize either method to control or time the cams, or power to increase the energy storage of the crossbow. . *Id.* Instead, the '015 Patent addresses cam rotation synchronization solely through the cam's configuration, which also permits increased limb deflection values during the drawing phase. *Id.* This results in firing the arrow out of the crossbow faster.

II. LEVEL OF ORDINARY SKILL IN THE ART

Solely for purposes of this Response, Patent Owner does not dispute Petitioner's proposed qualifications of a person of ordinary skill in the art ("POSA").

III. CLAIM CONSTRUCTION

Claim terms are generally given their ordinary and customary meaning, which is the meaning the term would have to a POSA at the time of invention. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2005) (en banc). “[O]nly those terms need be construed that are in controversy and only to the extent necessary to resolve the controversy.” *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

A. “Mounted to”

The ordinary and customary meaning of “mounted to” must be: “physically connected to allow only rotation about a fixed axis” when interpreted consistent with the intrinsic record of the ’015 Patent. In all instances in the ’015 Patent, “mounted to” describes the physical connection between a string guide and a limb and the resulting physical constraints on the string guide. EX2029, ¶¶69-73. Specifically, Claim 1 recites “a first string guide mounted to the first bow limb and rotatable around a first axis.” EX1001, Claim 1. As described and illustrated in Figure 12, the string guide is physically connected with the limb such that the string guide always moves with the limb it is mounted to, but for the ability of the string guide to rotate relative to the limb about an axis: “[t]he string guides 366 are mounted to the bow limb 362 and are rotatable around first and second axis 368A, 368B (‘368’), respectively.” EX2029, ¶70.

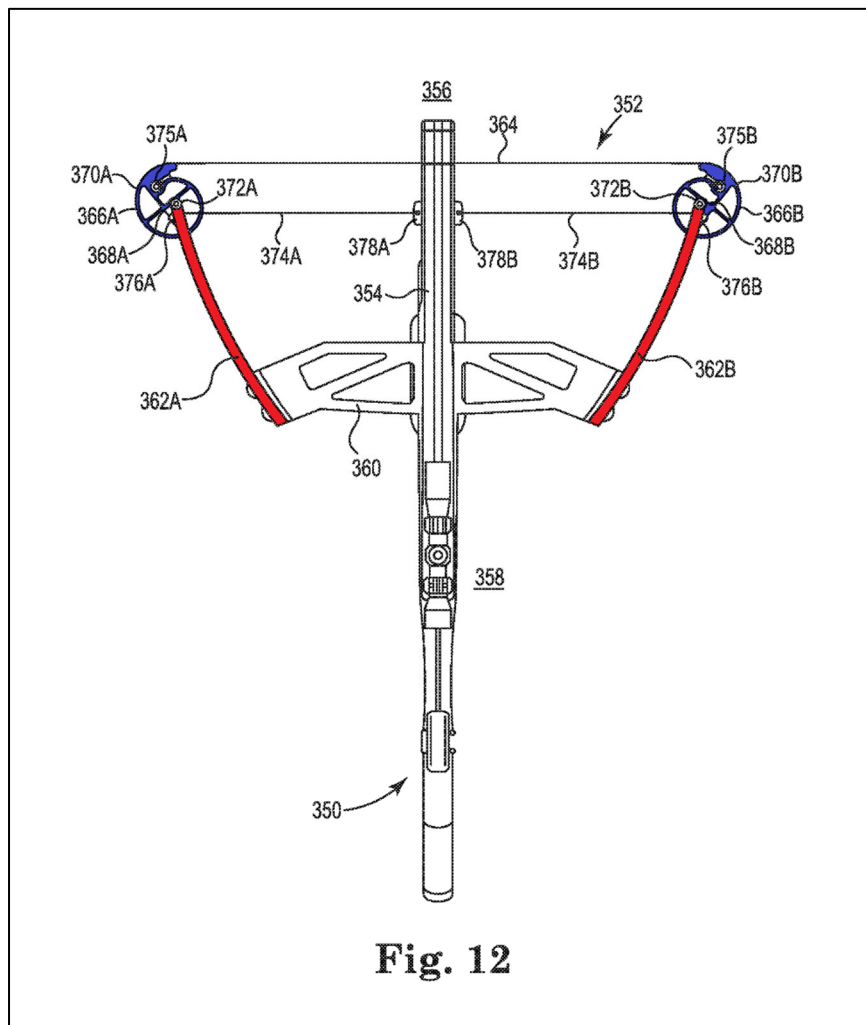
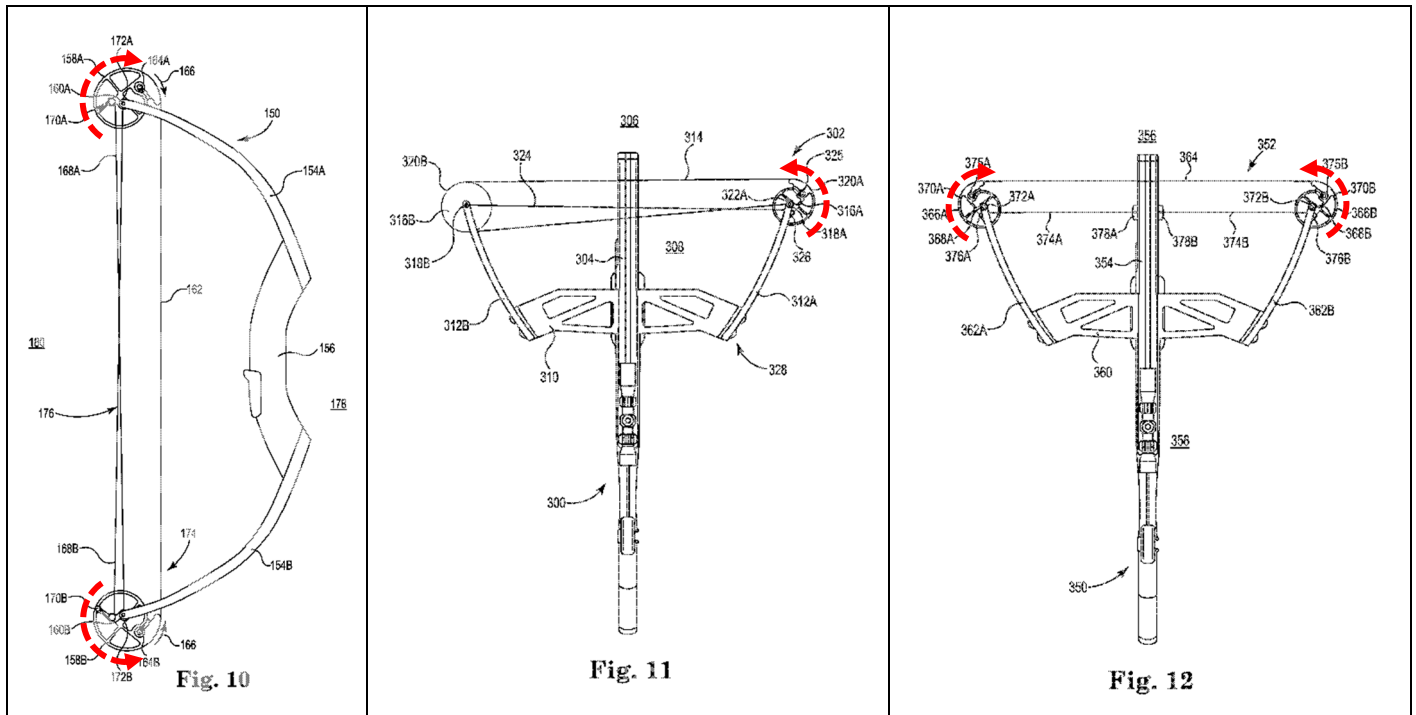


Fig. 12

Id., 6:34-36, Fig. 12 (annotated with string guides in blue and limbs in red); EX2005.

Similarly, all other embodiments describe and illustrate the string guides as physically connected to the limbs such that a string guide always moves with the limb it is mounted to, but for the ability of the string guide to rotate relative to the limb about an axis even when the embodiments are structurally different. EX2029, ¶71. For example, the specification describes applying the claimed string guide system to not only crossbows but also vertical bows. EX1001, Figs. 10-12, 3:34-42.

Yet, despite such differences, as seen in exemplary Figures 10-12 below, all figures depict the string guide physically connected to the limb such that the string guide always moves with the limb, but for the ability of the string guide to rotate relative to the limb about an axis:



the limb. *Id.*, ¶¶70-73; EX2005; *see also* EX1001, Fig. 12. While the string guide rotates about the fixed axis, it is otherwise directly affixed to and remains in the same position relative to the limb. EX2029 ¶70. Indeed, the '015 Patent does not disclose any embodiments where the string guide moves relative to the limb apart from rotation about a fixed axis. Any other movement is inherently constrained by the string guide's mount to the limb. *Id.*, ¶¶71-72.

Patent Owner disagrees with Petitioner's proposed construction of "mounted to" as "connected to, either directly or indirectly" as overly-broad and not supported. In Petitioner's view, ***any component*** of a crossbow is "mounted to" ***every other component*** regardless of where it is located or how many intermediate components exist in the chain of physical connections between the recited components or how such components rotate or move. This proposed construction cannot be the ordinary and customary meaning of "mounted to" as it would render the term "meaninglessly empty." *Ethicon Endo-Surgery, Inc. v. United States Surgical Corp.*, 93 F.3d 1572, 1578 (Fed. Cir. 1996) (refusing to interpret "connected to" to encompass indirect connections).

Petitioner's proposed construction fails to provide a POSA with any frame of reference to understand how the claimed crossbow components are arranged relative to one another. Under Petitioner's construction, "mounted to" is unbounded, with no way to differentiate between a seemingly infinite number of possible physical

relationships between the string guide and the limb. As Petitioner's expert, Stephen Batzer, testified, when applying Petitioner's construction, the string guide is not only "mounted to" the limb but also to the central portion, the other limb, the other string guide, the draw string, both power cables, and every other component of the crossbow, all of which the string guide is "connected to, either directly or indirectly." Petition, 26; EX1030, 146:13-148:13 ("If we had a crossbow on the table here and I were to mount an American flag decal to the stock, to one side of it for decoration, the decal is mounted directly to the stock, but indirectly to all other components."). With Petitioner's construction, a POSA has no meaningful information about the physical relationship between the string guide and the limb.

Claim 1 provides: a "crossbow, comprising:" "first and second flexible limbs" and "a first string guide mounted to the first bow limb and rotatable around a first axis." EX1001, Claim 1. Under Petitioner's construction, which permits both direct and endless indirect connections, "mounted to," is read entirely out of the claim—it tells the POSA nothing about the specific physical relationship between the "string guide" and the "limb." Adopting Petitioner's proposed construction effectively (and improperly) amends Claim 1 as follows: "a first string guide ~~mounted to the first bow limb and~~ rotatable around a first axis" and "a second string guide ~~mounted to the second bow limb and~~ rotatable around a second axis." Any construction that reads words out of the claim must be rejected. *See Apple Inc. v. Motorola Inc.*, 757

F.3d 1286, 1305 (Fed. Cir. 2014) (“proposed construction contradicts the claim language because it reads ‘analyzer server’ out of the claim”), *overruled on other grounds*; *Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 951 (Fed. Cir. 2006) (rejecting construction that “would read the height limitation out of the claim altogether”). Patent Owner’s construction—“physically connected to allow only rotation about a fixed axis”—is the only proper construction in view of the claim language and the intrinsic record.

IV. PETITIONER HAS NOT ESTABLISHED THAT CLAIM 1 IS UNPATENTABLE

A claim is unpatentable as anticipated under 35 U.S.C. §102 “if each and every limitation is found either expressly or inherently in a single prior art reference.” *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 851 F.3d 1270, 1273 (Fed. Cir. 2017) (citation omitted). “A claim limitation is inherent in the prior art if it is necessarily present in the prior art, not merely probably or possibly present.” *Akamai Techs., Inc. v. Cable & Wireless Internet Servs., Inc.*, 344 F.3d 1186, 1192 (Fed. Cir. 2003).

A claim is unpatentable as obvious under 35 U.S.C. §103 if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious to a POSA at the time of invention. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). “[R]ejections on

obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006). Courts and the Board must “be careful not to allow hindsight reconstruction of references to reach the claimed invention without any explanation as to how or why the references would be combined to produce the claimed invention.” *Kinetic Concepts, Inc. v. Smith & Nephew, Inc.*, 688 F.3d 1342, 1368 (Fed. Cir. 2012) (citation omitted).

A. Grounds 1-2: Stanziale '302

U.S. Patent Pub. No. 2012/0125302 (“Stanziale '302”) fails to disclose certain limitations of Claim 1 and thus does not render Claim 1 unpatentable as anticipated (Ground 1) or obvious (Ground 2). EX2029, ¶¶76-92.

1. Overview of Stanziale '302

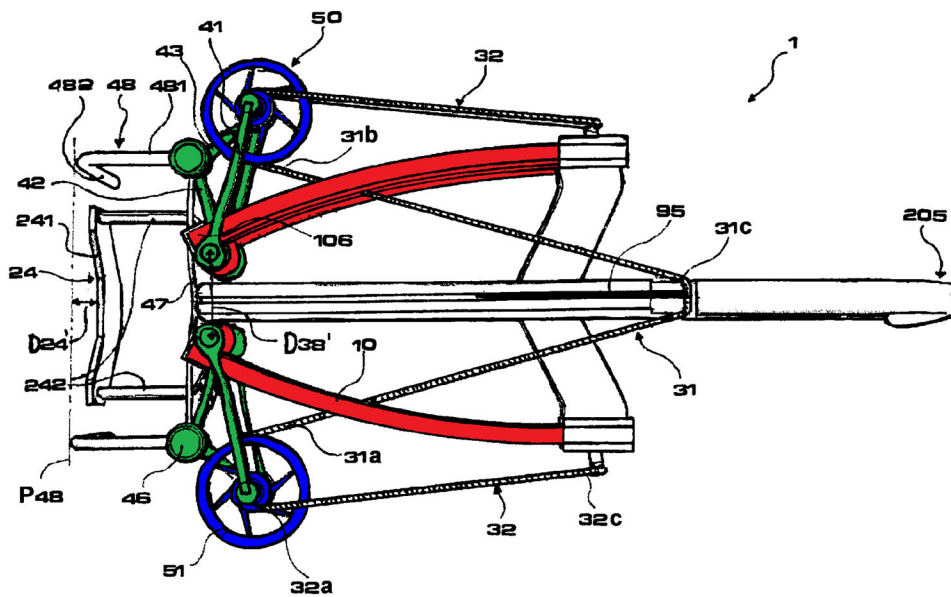
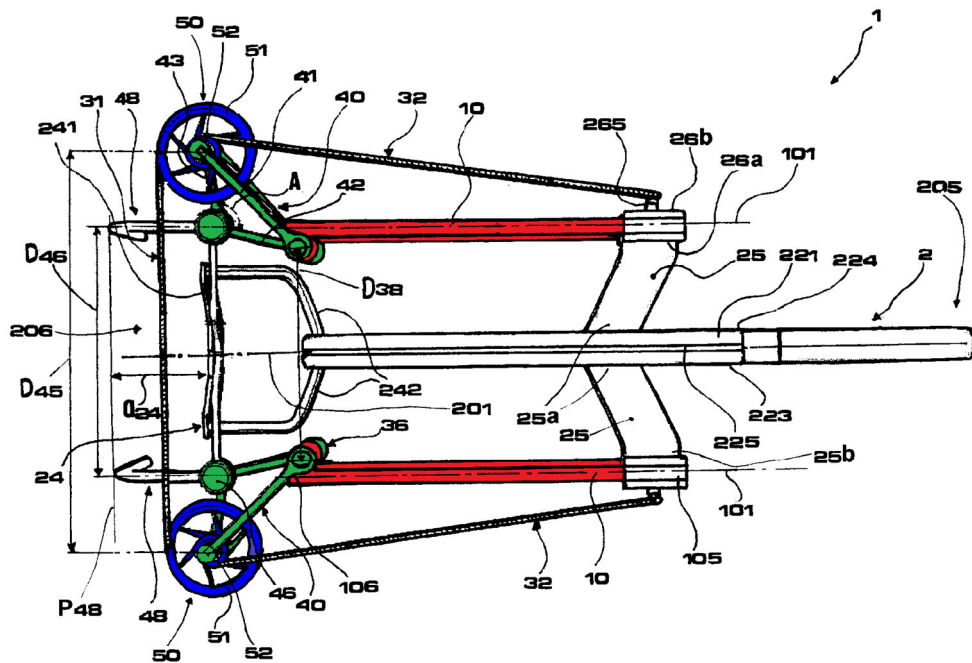
Stanziale '302 discloses a complicated and inefficient “device for firing a projectile” that would be difficult to combine with other references. *Id.*, ¶¶30-31. The relationship between the limbs, pulleys, and intervening lever structures creates complexity and opportunity for potential failure points. *Id.*, ¶32. Specifically, Stanziale '302 does not mount the pulley assemblies to the limbs, instead it uses intervening structures comprised of multicomponent levers. *Id.* Problematically, drawing the device would require significant force by the archer and create intense

stress on the limbs. *Id.*, ¶¶33-34. Moreover, the use of levers appear to impede the motion of the limbs to reach a fully drawn position. *Id.*, ¶¶35-37. Due to the overly complicated, multi-part structure of the Stanziale '302 device, a POSA would be disinclined to rely on it as a reference for the improved crossbow design disclosed in Claim 1. *Id.*, ¶38.

2. Stanziale '302 does not disclose “a first [and second] string guide mounted to the first [and second] bow limb”

Stanziale '302 does not disclose “a first string guide mounted to the first bow limb” or “a second string guide mounted to the second bow limb” under the correct construction of “mounted to.” *See* §III(A); EX2029, ¶78-87. Batzer agreed that Stanziale '302 does not disclose this element of Claim 1: “Yeah, this isn’t a mounting strategy that was used on the '015 patent.” EX1030, 210:7-8. Petitioner identifies pulley assemblies 50 as the recited string guides. Petition, 31. These structures, however, are not mounted to the first and second limbs (elastic members 10 (*id.*, 30)); EX2029, ¶81. Instead, as illustrated below, pulley assemblies 50 (blue) are mounted to levers 40 (green), which are distinct from limbs 10 (red).

Stanziale '302 (EX1007) at Figs. 2, 4



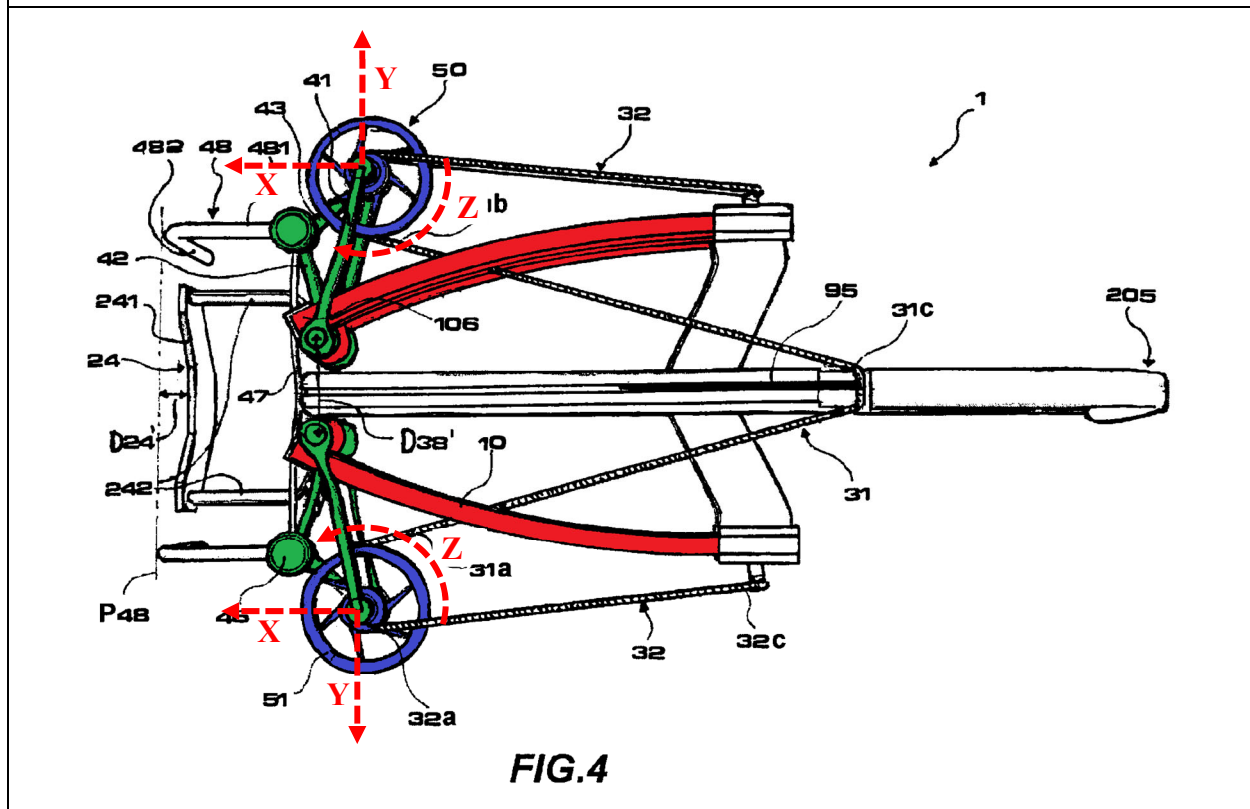
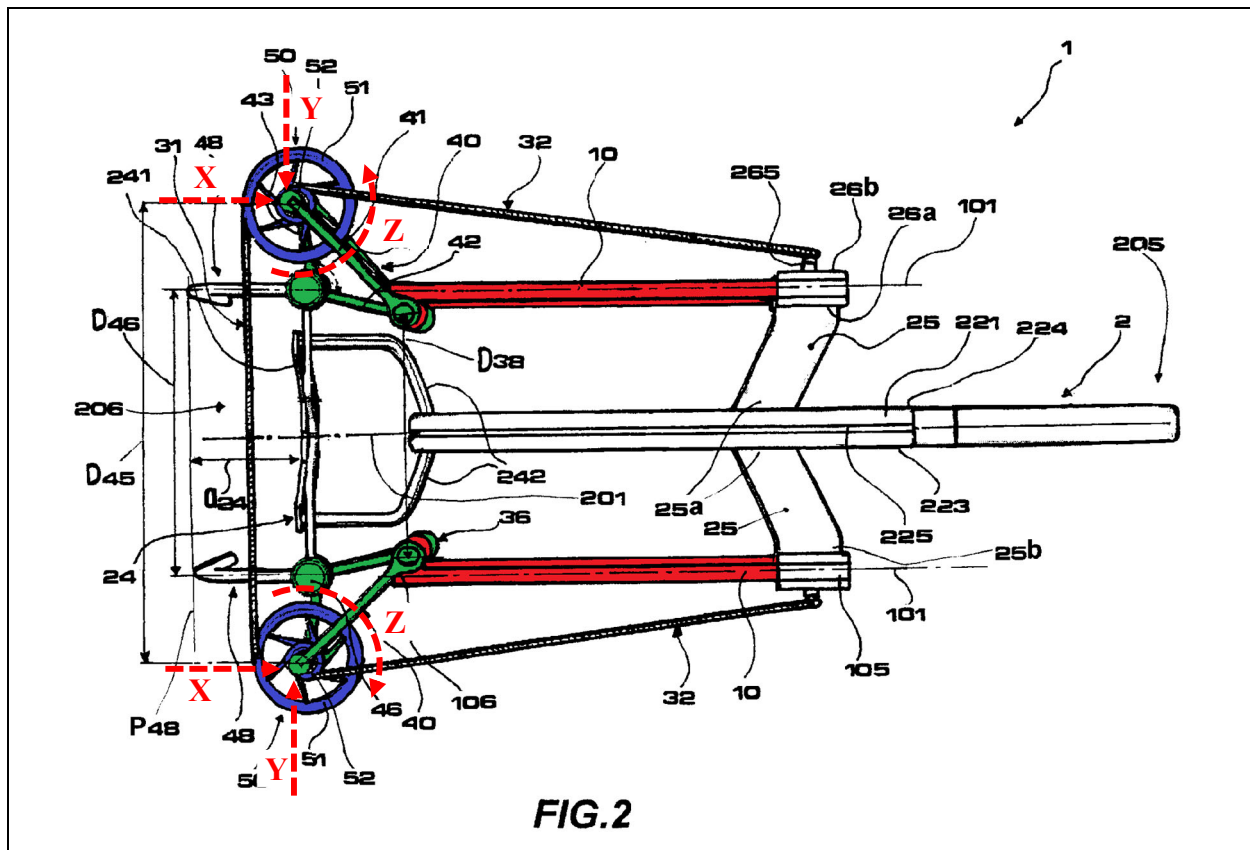
Id.

Stanziale '302 discloses that “each lever 40 comprises a rigid triangular-shaped structure formed by lower first branch 41*b*, second branch 42 and third branch 43; the upper first branch 41*a* is parallel with the lower first branch 41*b* and both are fastened to the first pivot 45.” EX1007, ¶[0095]. Then, each “pulley assembly 50, comprising a first pulley 51 and at least one second pulley 52, is mounted on the first pivot 45 and is configured to rotate with respect to the first pivot 45. Thus, the pulley assembly 50 is arranged between the upper first branch 41*a* and the lower first branch 41*b* and is pivoted to them,” where “each lever 40 is pivoted to the second end 106 of the elastic members 10 at the respective side of the stock 2.” *Id.*, ¶¶[0078], [0096]. Additionally, “[t]he pulley assembly 50 has a central bore 505 into which the first pivot 45 is inserted, so that the pulley assembly 50 is rotatable about the first pivot axis 450.” *Id.*, ¶[0099], Figs. 9-10.

Pulley assembly 50 is neither physically connected to elastic member 10 nor rotatable only about a vertical axis (pivot axis 450) relative to elastic member 10. EX2029, ¶¶82-84. Rather, because it is attached to an intervening lever 40 that itself rotates relative to the elastic member 10, pulley assembly 50 is both rotatable about a vertical axis and translatable along an x- and y-axes due to the pivoting of lever 40 relative to elastic member 10, providing for three degrees of freedom between pulley assembly 50 and elastic member 10. *Id.*, ¶¶84-85. In contrast, under the proper

construction of “mounted to,” there is only one degree of freedom between the string guide and limb recited in Claim 1. *Id.*, ¶¶68, 86.

As Stanziale '302 states, “the lever 40 comprises two first branches 41 (in particular, an upper first branch 41*a* and a lower first branch 41*b*), a second branch 42 and a third branch 43. The first, second and third branches 41, 42, 43 form a substantially triangular structure, so that the lever 40 is a basically non-deformable assembly,” where “lever 40 is pivoted to the respective connecting members 35*a*, 35*b* and, then, to the elastic members 10*a*, 10*b* fastened to the latter, the entire lever 40 being rotatable about the pin axis 380.” EX1007, ¶¶[0080], [0096], Figs. 9-10. Lever 40 is a moment arm pivotally mounted to elastic member 10 and provides two degrees of freedom between lever 40 and elastic member 10 (*i.e.*, translation along x- and y-axes). EX2029, ¶¶82-84. Pulley assembly 50 is rotatably mounted to lever 40, providing an additional degree of freedom (*i.e.*, pulley assembly 50 rotates about a z-axis relative to lever 40). *Id.*, ¶¶84-85. Viewed as a whole, there are at least three degrees of freedom between the elastic member and the pulley assembly (*i.e.*, x-axis translation, y-axis translation, and z-axis rotation). *Id.* Figures 2 and 4, annotated below, show the three degrees of freedom of pulley assemblies 50 (blue) and their corresponding motion as intervening levers 40 (green) rotate and elastic members 10 (red) move. *Id.*, ¶85.



Id., Figs. 2, 4 (annotated). Batzer agrees that this is how the pulley assemblies of Stanziale '302 move when the device is drawn:

The pulley 50, which is connected via lever 40 to the bow limb, then will move both back towards the down-range side. It will also move modestly inboard. So this is your X and Y coordinates. And the lever will rotate, when viewed from above, clockwise for the right limb, limbs, and counterclockwise for the bottom limbs. So the pulleys 50 or string guides do not maintain their absolute position relative to the limbs upon cocking.

EX1030, 208:20-209:5.

The three degrees of freedom between pulley assemblies 50 and elastic members 10 in Stanziale '302 are fundamentally different than what is claimed in Claim 1 or otherwise disclosed in the '015 Patent. EX2029, ¶86; EX1030, 210:7-8 (“Yeah, this isn’t a mounting strategy that was used on the '015 patent.”). As the annotated Figures 11-12 of the '015 Patent highlight, there is a single degree of freedom between the string guides (316A, 366 (blue)) and limbs (312A, 362 (red)):

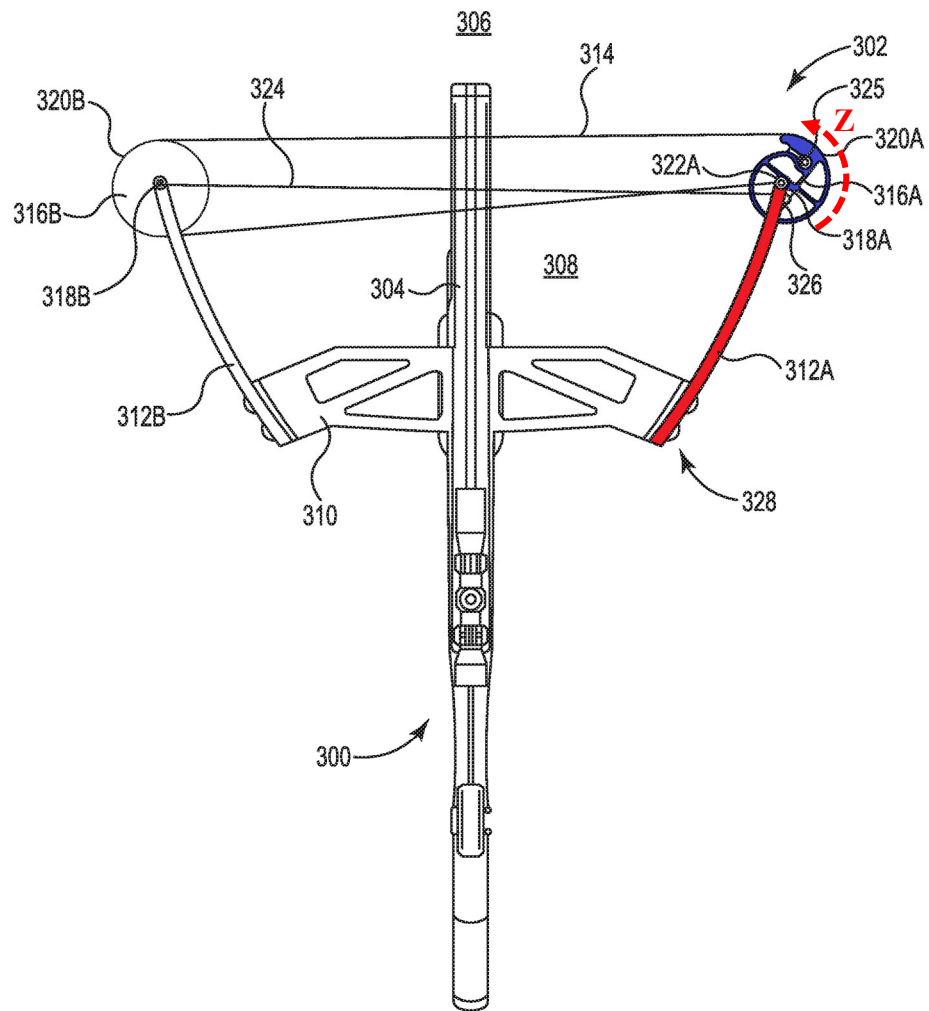
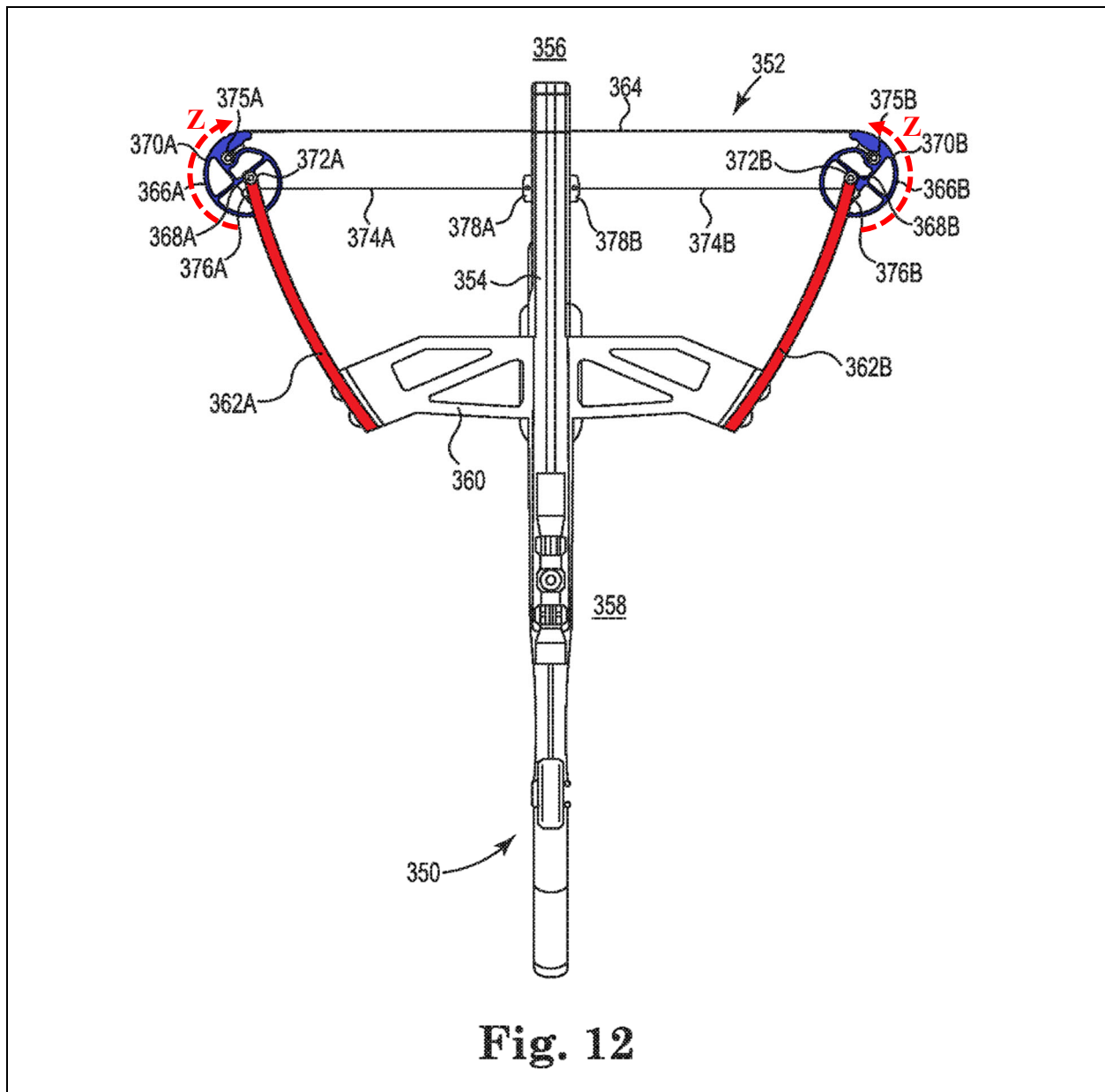


Fig. 11



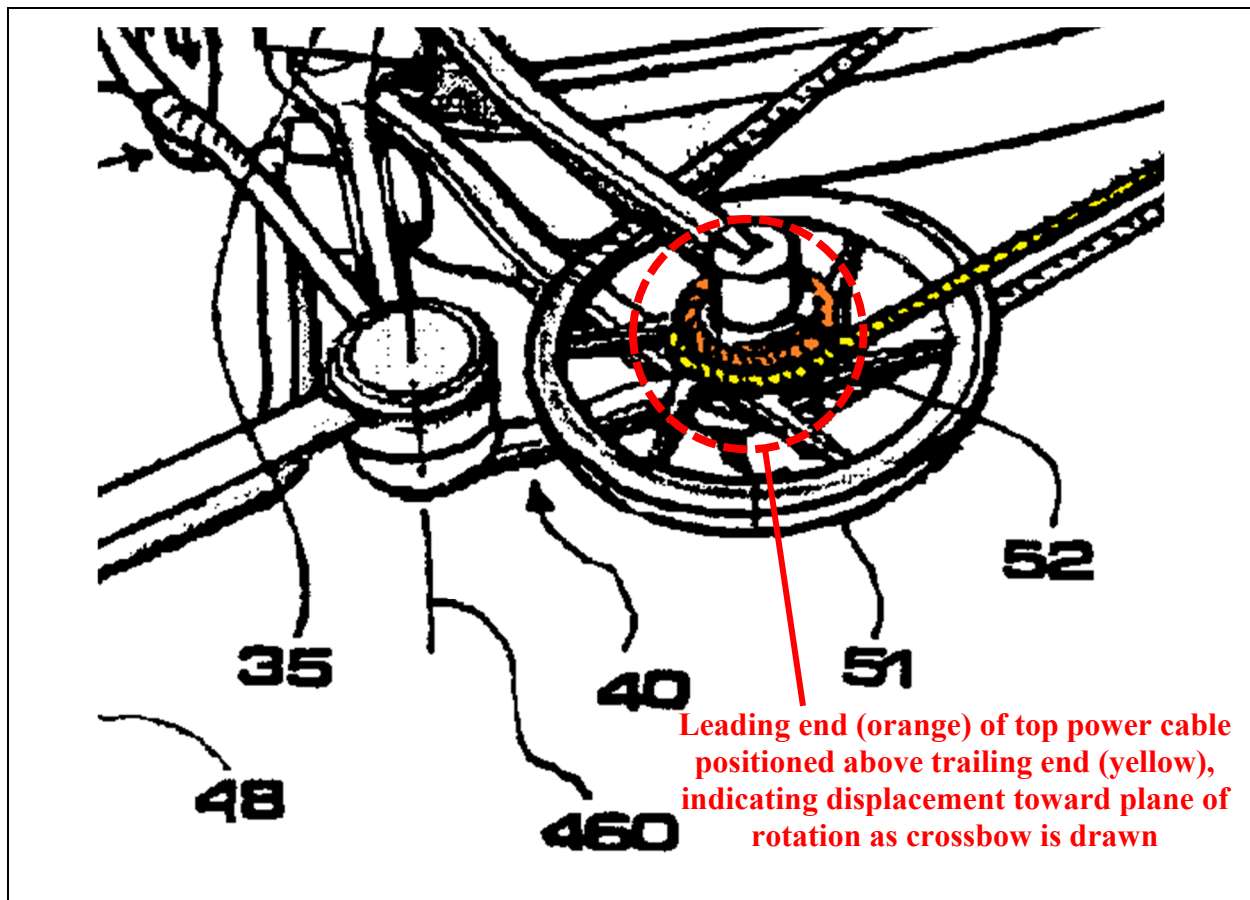
EX1001, Figs. 11-12 (annotated); EX2005.

Applying the proper construction of “mounted to,” Stanziale ’302 does not disclose “a first string guide mounted to the first bow limb” or “a second string guide mounted to the second bow limb,” EX2029, ¶¶78-87, which is fatal to any anticipation argument.

3. Stanziale '302 does not disclose: “the first and second power cables...are displaced along the first and second axes away from the first and second planes of rotation of the first and second draw string journals, respectively”

Stanziale '302 also does not disclose a crossbow in which “the upper and lower power cables...are displaced along the first and second axes *away from the first and second planes of rotation of the first and second draw string journals.*”

EX2029, ¶¶88-92. Even if Stanziale '302 discloses some sort of helical shape—Stanziale '302 states that “the perimetral track...521” of the second pulley 52 “may be a simple annular groove or it may have a spiral or helical shape so as to wind a plurality of turns of a flexible element” (EX1007, ¶[0106])—Figure 3 highlights that the power cables are being displaced *toward* the first and second planes of rotation, rather than *away from* these planes as required by Claim 1. EX2029, ¶90.



Id., Fig. 3 (excerpted and annotated).

Petitioner fails to identify any teaching in Stanziale '302 that contradicts Figure 3. Even Batzer admits that “upon rereading [Stanziale '302], that Stanziale does not say directly which direction they go. I think that he remains silent.” EX1030, 212:22-23. In view of this concession, Petitioner’s conclusory assertion— “[b]ecause the helical power cable journals 521 are on opposite sides of the draw string journal 511, a POSA would immediately envisage that the helical configuration of the power cable journals 521 would need to be such that the power cables 32 extend away from (rather than towards) the draw string journal 511 to

avoid interference with the draw string 31,” Petition, 36—must be rejected. The only support Petitioner cites is Batzer, who repeats the Petition’s language *verbatim* without citing additional evidence. EX1016, ¶151, who has since contradicted his opinion. EX1030, 212:22-23. Such “evidence” is entitled to no meaningful weight. *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9, 15 (PTAB Aug. 24, 2022) (precedential).

None of the portions of Stanziale ’302 that Petitioner and Batzer cite for other portions of its analysis, (*see* EX1016, ¶151; Petition, 35-36), describe or depict “the power cables wrap onto the power cable take-up journals and are displaced along the axes away from the draw string journal planes of rotation.” EX2029, ¶91. Thus, Petitioner fails to provide any viable support for this critical limitation, instead relying on conclusory arguments regarding Stanziale ’302’s purported teachings. This is not enough to meet Petitioner’s burden. *See Unirac, Inc. v. EcoFasten Solar, LLC*, IPR2021-00532, Paper 7, 20-21 (PTAB July 22, 2021).

Petitioner’s reliance on *Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331 (Fed. Cir. 2016) to overcome Stanziale ’302’s missing disclosure is misplaced. Despite Petitioner’s misleading parenthetical characterization, *Blue Calypso*, relying on *Kennametal, Inc. v. Ingersoll Cutting Tool Co.*, 780 F.3d 1376 (Fed. Cir. 2015), merely stands for the proposition that a reference that ***actually discloses all of the necessary elements*** of a claimed combination “need not always include an express

discussion of the actual combination to anticipate” but rather “may still anticipate if that reference teaches that the disclosed components or functionalities may be combined and one of skill in the art would be able to implement the combination.” *Id.* at 1344. Moreover, this line of cases “does **not** permit the Board to fill in missing limitations simply because a skilled artisan would immediately envision them.” *Nidec*, 851 F.3d at 1274 (“*Kennametal* does not stand for the proposition that a reference missing a limitation can anticipate a claim if a skilled artisan viewing the reference would ‘at once envisage’ the missing limitation. Rather, *Kennametal* addresses whether the disclosure of a limited number of combination possibilities discloses one of the possible combinations.”).

Here, Petitioner fails to identify any portion of Stanziale ’302 that purportedly discloses that “the power cables wrap onto the power cable take-up journals and are displaced along the axes away from the draw string journal planes of rotation.” EX2029, ¶91. As discussed, to the extent Stanziale ’302 discloses any displacement along the axes, it discloses displacement **toward** the draw string journal planes of rotation, not away from them. This limitation is entirely absent from Stanziale ’302 regardless of what Petitioner claims a POSA would “envisage.” Stanziale ’302 does not anticipate Claim 1.

4. Petitioner fails to establish motivation to modify Stanziale '302 (Ground 2)

In Ground 2, Petitioner argues it would have been obvious to modify Stanziale '302 to yield “the first and second power cables...are displaced along the first and second axes away from the first and second planes of rotation of the first and second draw string journals, respectively” because, with “only two options,” *i.e.*, displacement towards the plane of rotation or away from the plane of rotation, “it would be obvious to try each.” Petition, 36.

Petitioner fails to explain *why* a POSA would have wanted to try each configuration. Petitioner's assertions amount to nothing more than an unsubstantiated claim that a POSA *could* have made the asserted change, without explaining why a POSA would have been *motivated to* do so. This is insufficient to meet Petitioner's burden to articulate a motivation to modify. *Palo Alto Networks, Inc. v. Finjan, Inc.*, IPR2015-01979, Paper 62, 62-63 (PTAB Mar. 15, 2017) (“It is not enough to assert that the prior art provides two options and that it would have been predictable to implement either.”); *see also Belden v. BerkTek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015) (“[O]bviousness concerns whether a skilled artisan not only *could have made* but *would have been motivated to make* the combinations or modifications of prior art to arrive at the claimed invention.”) (original emphasis). Moreover, Petitioner “did not address the predicate factual determination that the

Supreme Court [in *KSR*] identifies – e.g., that there would have been ‘a design need or market pressure,’ that there were ‘identified and ‘predictable’ solutions.” Decision, 17 (*quoting KSR* at 421). As such, “Petitioner does not provide a sufficient reason for modifying Stanziale ’302, in order [sic] satisfy the identified limitation of claim 1.” *Id.*, 18.

Batzer fails to provide the necessary motivation, simply repeating Petitioner’s arguments *verbatim* without providing any additional evidence. *Compare* Petition, 36, 40, 45 with EX1016, ¶¶155, 173, 191. Such “evidence” is insufficient to support motivation to modify and is entitled to little or no weight. *Samsung Elecs. Co. v. LED Wafer Sols., LLC*, IPR2021-01491, Paper 11, 12-13 (PTAB Oct. 26, 2022); *see also Xerox*, Paper 9, 15.

Moreover, neither Petitioner nor Batzer discuss the impact of modifying the direction of the power cable displacement in Stanziale ’302 on the structure as a whole. EX2029, ¶¶179-191. For example, when torque is applied to a crossbow’s limb, without compensating for or neutralizing these forces, functionality of the bow suffers. *Id.*, ¶183. Indeed, limb twist impacts arrow propulsion and results in related inaccuracies as both limbs and cams move in unwanted directions. EX2031; EX2029, ¶183.

Further problematic, if the torque is severe enough, the various components of the crossbow (e.g., limbs, cams, or pulleys, or any intervening structures

therewith) may deform or fracture (either laterally or longitudinally), resulting in catastrophic failure of the bow. EX2029, ¶184. Where designs fail to account for or allow for adjustment to limb deflection or alignment of cams in crossbows, limb twist and cam lean can result in greater wear on components like strings and cables. *Id.*

Specifically, the presence of the lever 40 in Stanziale '302 between the device's cams or pulleys and their limbs introduces a number of additional joints or components that are prone to failure or warping when unplanned forces are applied to them. *Id.*, ¶186. Modifying the displacement of the power cables not only affects that cam and its immediately connected components but imposes twisting forces on the other connection points and components in the intervening structures, including down the length of the limbs themselves. *Id.* Further, having more components between the cam and the limb results in the amount of torque acting on the limb to be amplified, which in turn requires the use of a more robust limb to absorb and withstand those forces. *Id.*

Petitioner and Batzer summarily dismiss the impact of modifying the direction of the power cable displacement, but a POSA would have understood such a change would have unpredictable effects on the device's stability and functionality. EX2029, ¶¶186-187, 189-190. A POSA would know that the limbs in Stanziale '302 are not robust enough to survive the contemplated degree of torque. Stanziale '302

describes how the device has three different positions: (1) an unloaded or rest condition (Ex1007 at ¶[0134], Figs. 1-2); (2) a loaded condition (*id.* at ¶[0140], Figs. 3-4), and (3) a fully unloaded condition (*id.* at ¶[0154], Figs. 5-6). In the “fully unloaded condition,” Stanziale ’302 teaches that “elastic members 10 are deformed in an opposite direction with respect to the loaded condition, i.e. they are bent away from the stock 2.” *Id.* at ¶[0155]; EX2029, ¶187. A POSA would recognize this to be a severe disadvantage and a feature that undermines both the longevity of the device and the feasibilities of making any changes that increase torque on the limbs. *Id.* For example, the residual vibration from the volume of moving parts as the bow moves from the loaded configuration to an unloaded configuration will run through the limb, resulting in stress and increasing the potential for fatigue fractures that may damage and weaken the limb to the point of catastrophic failure. *Id.*

Further, placing pulley assemblies or any other heavy component a distance away from the end of the limbs – as Stanziale ’302 teaches – increases the risk that one pulley assembly, or some components thereof, will become out of sync with the other pulley assembly, which is detrimental to the accuracy and operability of the crossbow. *Id.*, ¶189. A POSA would recognize that further modifications to those pulley assemblies, such as by reversing the direction of a helical journal or adding a helical journal where one previously did not exist, exacerbates the effect this added weight has and increases the risk of de-synchronization and the resulting decrease in

accuracy and functionality by changing how that weight is distributed relative to the end of the limb. *Id.* Moreover, while such changes would directly impact deflection of the limbs, it also would have a cascading effect throughout other components of the device, such as the drawstring, which would negatively impact the path of a bolt or other projectile as it is released from the device. *Id.*

Petitioner fails to offer articulated reasoning based on rational underpinnings for a motivation to modify Stanziale '302; Stanziale '302 does not render Claim 1 obvious.

B. Grounds 3-4: Stanziale '062

WO 2011/158062 (“Stanziale '062”) fails to disclose certain limitations and does not render Claim 1 unpatentable as anticipated (Ground 3) or obvious (Ground 4). EX2029, ¶¶93-113.

1. Overview of Stanziale '062

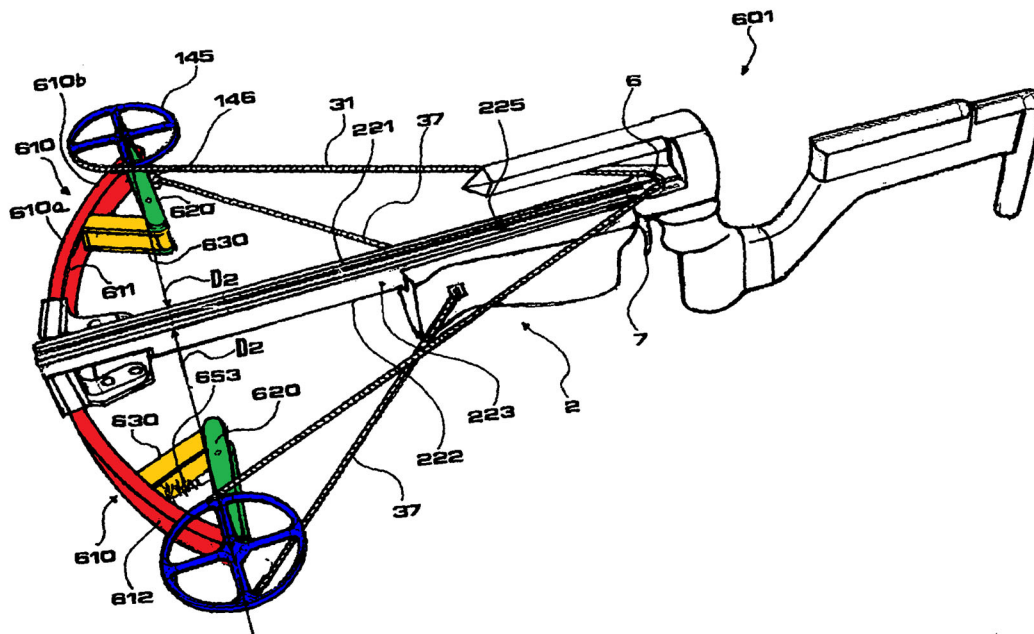
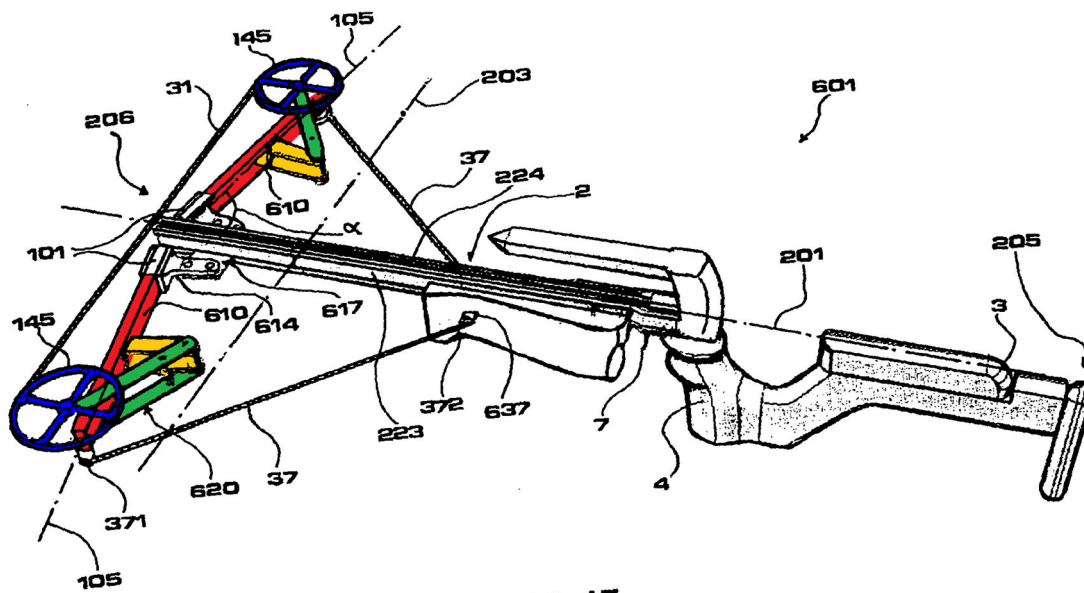
Similar to Stanziale '302, Stanziale '062 discloses a complicated and inefficient device “for launching a projective or a launch object in general.” *Id.*, ¶¶39-40. The relationship between the limbs, pulley assemblies, auxiliary arms, and stirrups creates complexity and opportunity for potential failure points. *Id.*, ¶41. Specifically, Stanziale '062 does not mount the pulley assemblies to the limbs, instead it uses intervening structures comprised of auxiliary arms and stirrups. *Id.* Due to the overly complicated, multi-part structure of the Stanziale '062 device, a

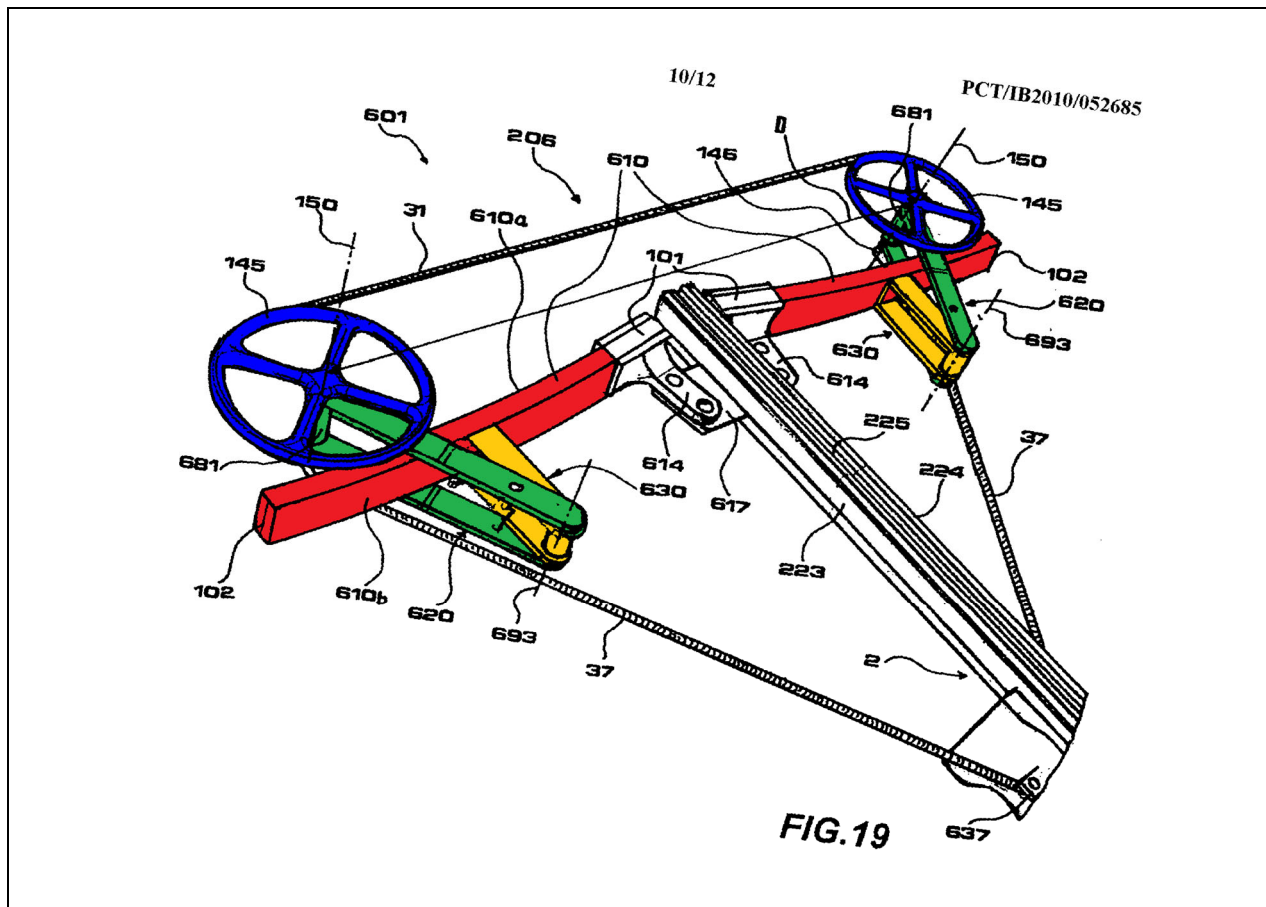
POSA would be disinclined to rely on it as a reference for the improved crossbow design disclosed in Claim 1. *Id.*, ¶42.

2. Stanziale '062 does not disclose “a first [and second] string guide mounted to the first [and second] bow limb”

Stanziale '062 does not disclose “a first string guide mounted to the first bow limb” or “a second string guide mounted to the second bow limb” under the correct construction of “mounted to.” *See* §III(A). Petitioner identifies either pulleys 145 or the combination of pulleys 145, pulleys 146, and pivot 147 (hereinafter, “pulley assembly 145-146-147”) as the recited string guides. Petition, 37-38. Regardless of which interpretation is used, neither of these structures is mounted to the first and second limb (identified by Petitioner as elastic members 610). EX2029, ¶¶95-98. Rather, pulleys 145/pulley assemblies 145-146-147 are mounted to auxiliary arms 620, which are distinct from elastic members 610. *Id.*, ¶98. This can be seen in the below annotated Figures 17-19, illustrating auxiliary arms 620 (green), stirrups 630 (yellow), pulley assemblies 145-146-147 (blue), and elastic members 610 (red):

Stanziale '062 (EX1011) at Figs. 17-19





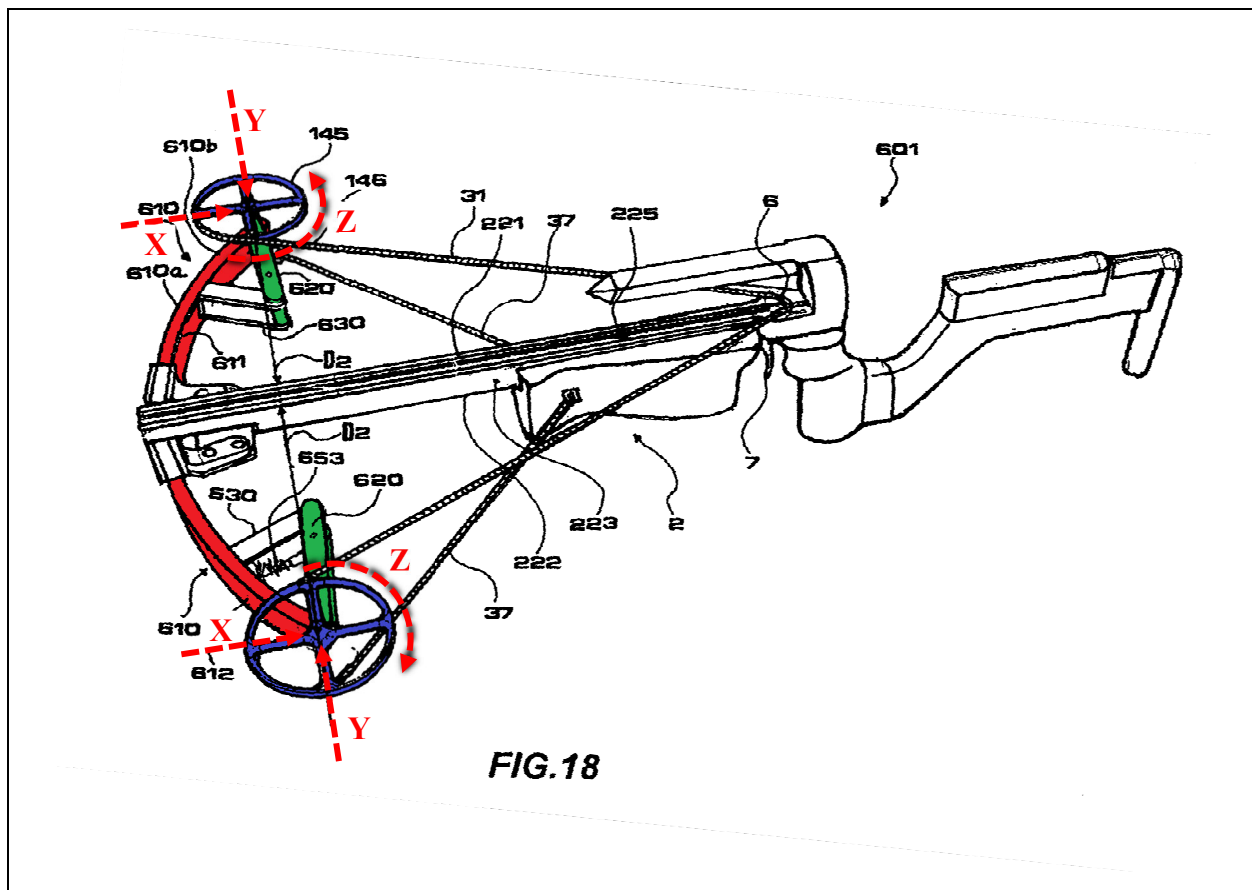
Specifically, Stanziale '062 discloses that “[t]he second length 610b of the elastic member 610, the stirrup 630 and the auxiliary arm 620 form a triangle having a variable shape, i.e. having one movable side 620,” and “the auxiliary arm 620 crosses the respective elastic member 610.” EX1011, 29:30-35. “The auxiliary arm 620 is then a supporting member for the pulleys 145, 146, which are pivotably mounted on the auxiliary arm 620 itself,” while “the auxiliary arms 620 move on a plane which is substantially parallel to a plane on which portions of elastic members 610 move during deformation.” *Id.*, 29:2-3, 29:15-16; *see also id.*, 29:23-29.

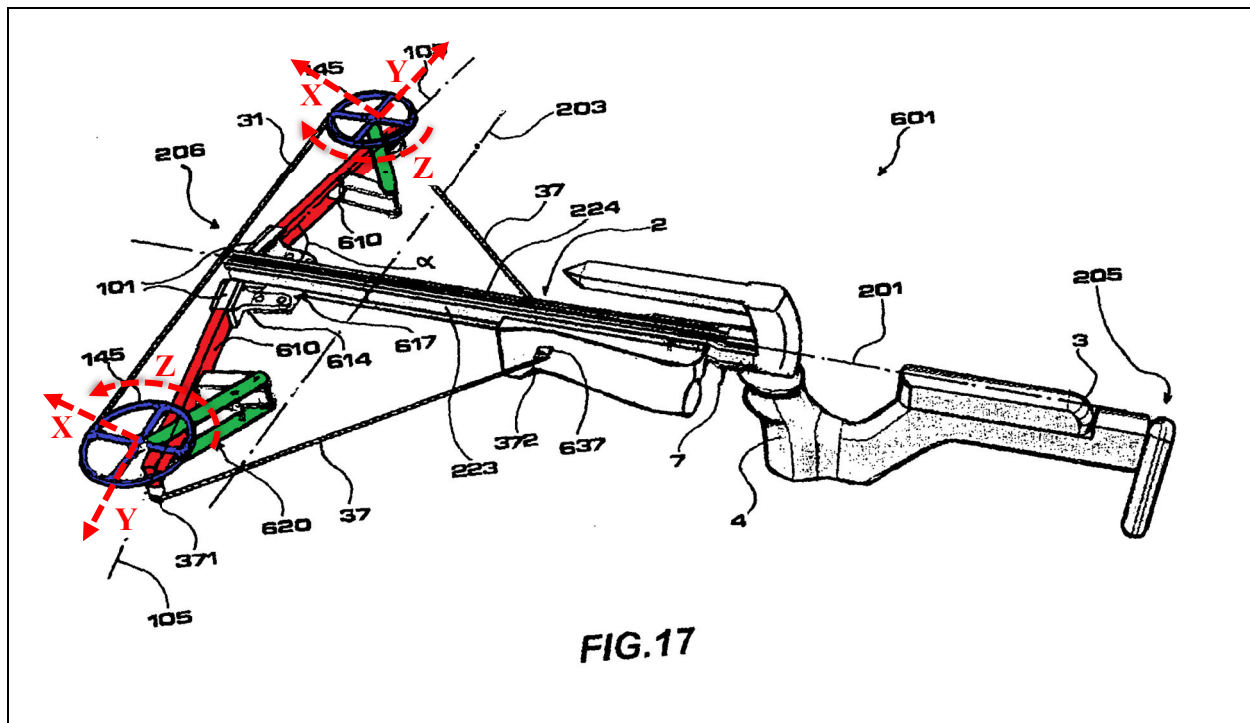
Additionally, “[t]he first and second pulleys 145, 146 rotate jointly around an axis of rotation 150, which is the axis of pivot 147 and of tubular housing 681.” *Id.*, 27:34-28:1; *see also id.*, Figs. 20-21.

Pulley 145/pulley assembly 145-146-147 is neither physically connected to elastic member 610 nor rotatable only about a vertical axis (axis 150) relative to elastic member 610. EX2029, ¶¶99-104. Rather, because it is attached to an intervening auxiliary arm 620, pulley 145/pulley assembly 145-146-147 is both rotatable about a vertical axis and translatable along x- and y-axes due to the pivoting of auxiliary arm 620 relative to elastic member 610, providing for three degrees of freedom between pulleys 145/pulley assemblies 145-146-147 and elastic member 610. *Id.*, ¶103. In contrast, under the proper construction of “mounted to,” there is only one degree of freedom between the string guide and limb recited in Claim 1. *Id.*, ¶¶68, 104.

Like Stanziale '302's lever 60, Stanziale '062's auxiliary arm 620 is a moment arm pivotally mounted to elastic member 610 and provides two degrees of freedom between auxiliary arm 620 and elastic member 610 (*i.e.*, translation along x- and y-axes). EX2029, ¶104. Pulley 145/pulley assembly 145-146-147 is rotatably mounted to auxiliary arm 620 and provides an additional degree of freedom (*i.e.*, the pulley/pulley assembly rotate about a z-axis relative to auxiliary arm 620). *Id.*, ¶¶103-104. When this linkage of components is viewed as a whole, there are three

degrees of freedom between the elastic member and the pulley/pulley assembly (*i.e.*, x-axis translation, y-axis translation, and z-axis rotation). *Id.*, ¶104. Stanziale '062's Figures 17-18, annotated below, show the three degrees of freedom of pulleys 145/pulley assemblies 145-146-147 (blue) and their corresponding motion as intervening auxiliary arms 620 (green) rotate and elastic members 610 (red) move. *Id.*, ¶103.





EX1011, Figs. 17-18 (annotated). These figures of Stanziale '062 demonstrably show three degrees of freedom between pulleys 145/pulley assemblies 145-146-147 and elastic members 610. EX2029, ¶103. This is fundamentally different from the '015 Patent, which provides for a single degree of freedom between the string guides and limbs. *Id.*, ¶105; see §IV(A)(2).

When the proper construction of “mounted to” is applied, it is readily apparent that Stanziale '062 does not disclose “a first string guide mounted to the first bow limb” or “a second string guide mounted to the second bow limb.” EX2029, ¶95-106. Stanziale '062 does not anticipate Claim 1.

3. Stanziale '062 does not disclose a crossbow in which “the first and second power cables...are displaced along the first and second axes away from the first and second planes of rotation of the first and second draw string journals, respectively”

Stanziale '062 does not disclose a crossbow in which “the upper and lower power cables...are displaced along the first and second axes *away from the first and second planes of rotation of the first and second draw string journals.*” EX2029, ¶¶107-113. Batzer agrees that Stanziale '062 does not disclose this limitation. EX1030, 218:6-219:20 (“Q. Because in your view, Stanziale '062 is silent as to which direction - -. A. Yes. Q. - - the cable would wrap? A. Right, right.”). Although Stanziale '062 may disclose a helical shape of some sort—it states that “track or groove 1461” of second pulley 146 may “ha[ve] a spiral or helical shape, so as to wind a plurality of turns of flexible force element 37...” (EX1011, 17:4-9)—it says nothing about displacing power cables “along first and second axes *away from the first and second planes of rotation of the first and second draw string journals*” as recited in Claim 1.

Stanziale '062's disclosure is limited to “groove 1461 has a spiral or helical shape, so as to wind a plurality of turns of flexible force element 37, or it is a simply annular groove.” EX2029, ¶109; EX1011 at 17:8-9. Stanziale '062 fails to provide structure of the track or groove 1461 with any meaningful boundaries, leaving a POSA with no guidance how to implement a helical shape. EX2029, ¶110-111. As

a result, a POSA would be discouraged from attempting to displace the flexible force member toward or away from the plane of rotation, particularly because Stanziale '062 does not provide any information from which a POSA could determine what extent or direction of displacement would allow the disclosed device to function as intended. *Id.*, ¶112. As already discussed regarding Stanziale '302, a POSA would recognize that the direction of displacement would have significant implications for the functionality of the device as even minor changes to a crossbow's design can have a dramatic impact on accuracy or structural stability. *See* §IV(A)(4). As such, a POSA would recognize that she would have to engage in extensive experimentation to determine what effects a practically limitless number of variations on the structure of track or groove 1461 would have on the device's performance and, indeed, whether any form of displacement would be feasible at all. EX2029, ¶112.

None of Petitioner's and Batzer's cited portions of Stanziale '062 (*see* EX1016, ¶167; Petition, 39), describe or depict "the power cables wrap onto the power cable take-up journals and are displaced along the axes away from the draw string journal planes of rotation." Rather, Petitioner relies on *ipse dixit*, baldly asserting with only a cite to Batzer that "[t]he helical nature of journals 1461 means that a POSA would at once envisage that the cable 37 wraps on those journals in one of two directions along the axis 150: toward the string planes of rotation or away."

Petition, 39. Batzer merely repeats this same phrase *verbatim* without citing any evidence. EX1016, ¶167. Such “evidence” is entitled to no meaningful weight, *Xerox*, Paper 9, 15, and such *Ipse dixit* and conclusory arguments regarding Stanziale '062's purported teachings are insufficient. *See Unirac*, Paper 7, 20-21.

Blue Calypso does not salvage Petitioner's arguments. As discussed (*see* §IV(A)(3)) Federal Circuit precedent “does ***not*** permit the Board to fill in missing limitations simply because a skilled artisan would immediately envision them.” *Nidec*, 851 F.3d at 1275 (emphasis added). Because Petitioner fails to identify any portion of Stanziale '062 that purportedly discloses that “the power cables wrap onto the power cable take-up journals and are displaced along the axes away from the draw string journal planes of rotation, Stanziale '062 cannot anticipate Claim 1 regardless of what Petitioner claims a POSA would “envisage.”

4. Petitioner fails to establish motivation to modify Stanziale '062 (Ground 4)

As with Ground 2, Petitioner offers the same conclusory and deficient analysis that “it would be obvious to try [wrapping the power cables away from the string planes of rotation]” since there can only be two options (toward the string planes of rotation or away).” Petition, 40. For the same reasons Petitioner's modification to Stanziale '302 fails, Petitioner fails to establish a motivation to modify Stanziale '062. *See* §IV(A)(4). Like Stanziale '302, the presence of auxiliary arms 620 and

stirrups 630 in Stanziale '062 between the device's cams or pulleys and their limbs introduces a number of additional joints or components that are prone to failure or warping when unplanned forces are applied to them. EX2029, ¶¶186-190. A POSA would expect the same problems to arise in these vibration-inducing devices, (*see, e.g.,* EX1011 at 7:12-14 (describing the device “in a rest condition, in a loaded or charge condition, and in a maximum discharge condition”), Figs. 17-19 (Fig. 19 showing reverse flexing of limbs)), as in Stanziale '302. EX2029, ¶188. While Petitioner and Batzer summarily dismiss the impact of modifying the direction of the power cable displacement, a POSA would have understood that such a change would have unpredictable effects on the device's stability and functionality, undermining any motivation to modify Stanziale '062. *Id.*, ¶¶179-191.

C. Grounds 5-6: Stanziale '771

WO 2011/141771 (“Stanziale '771”) fails to disclose certain limitations and does not render Claim 1 unpatentable as anticipated (Ground 5) or obvious (Ground 6). EX2029, ¶¶114-128.

1. Overview of Stanziale '771

As with Stanziale '302 and Stanziale '062, Stanziale '771 discloses a complicated and inefficient device “for launching a projective or a launch object in general.” *Id.*, ¶¶43-44. The relationship between the limbs, pulley assemblies, pushing arms, and other elements creates complexity and opportunity for potential

failure points. *Id.*, ¶45. Specifically, Stanziale '771 does not mount the pulley assemblies to the limbs, but instead uses intervening structures comprised of pushing arms and elements. *Id.* Due to the overly complicated, multi-part structure of the Stanziale '771 device, a POSA would be disinclined to rely on it as a reference for the improved crossbow design disclosed in Claim 1. *Id.*, ¶46.

2. Stanziale '771 does not disclose or render obvious “a first [and second] string guide mounted to the first [and second] bow limb”

Stanziale '771 does not disclose “a first string guide mounted to the first bow limb” or “a second string guide mounted to the second bow limb” under the correct construction of “mounted to.” *See* §III(A). Petitioner identifies either pulleys 145 or pulley assemblies 145-146-147 as the recited string guides. Petition, 41-42. Neither of the identified structures are mounted to the first and second limbs (apparently identified as elastic members 10 (*id.*)). Rather, pulleys 145/pulley assemblies 145-146-147 appear to be mounted to pushing arms 32, which are distinct from elastic members 10. EX2029, ¶¶117-119, 126. Although Stanziale '771's disclosure is unclear, pushing arms 32 may (or may not) then be connected to the limbs to provide multiple degrees of freedom between pulleys 145/pulley assemblies 145-146-147 and elastic members 10. *Id.*, ¶¶120-125. This can be seen in the following annotated versions of Figures 11 and 12, which show pushing arms 32 (green), elements 27 (yellow), pulley assemblies 145-146-147 (blue), and elastic members 10 (red):

Stanziale '771 (EX1012) at Figs. 11-12

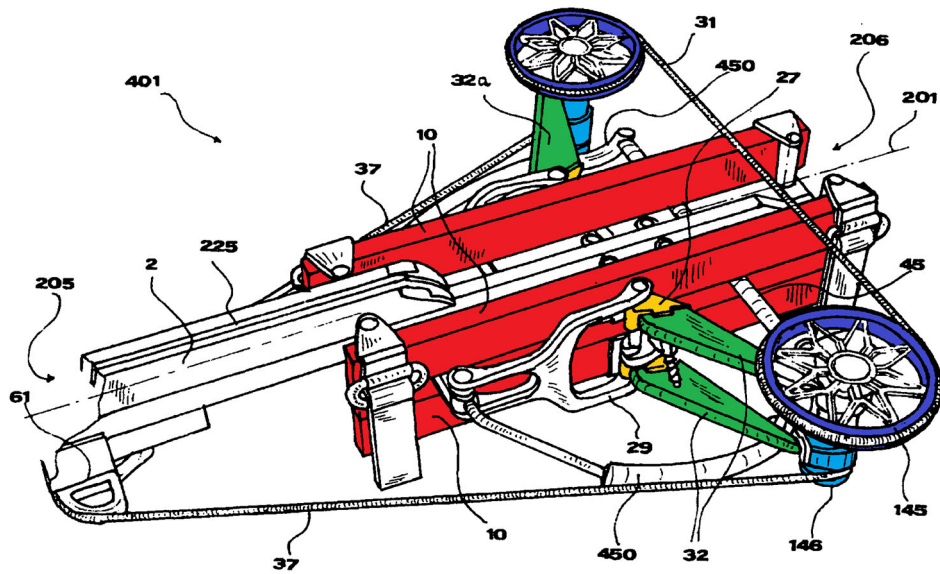


FIG. 11

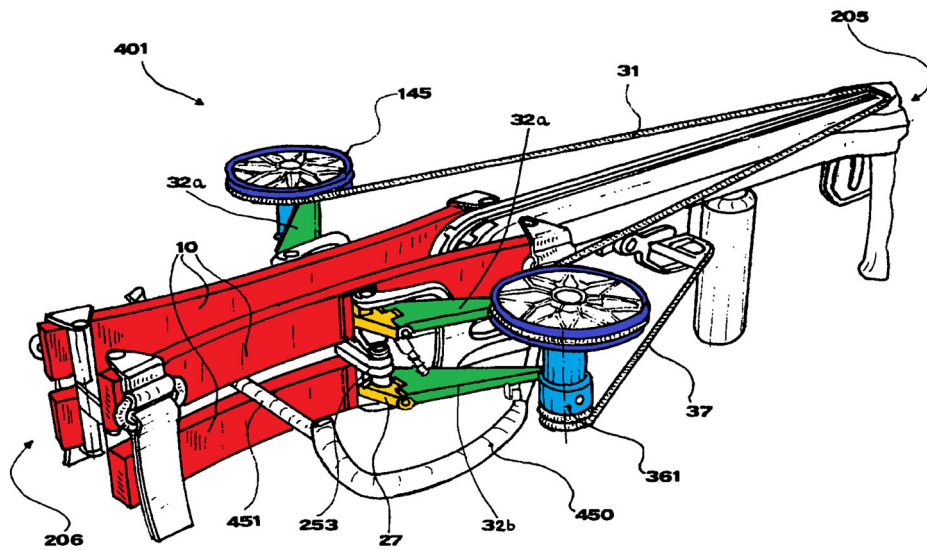


FIG. 12

Id., ¶119.

Stanziale '771 discloses that four pushing arms 32 form “pushing means” that are “apt to cooperate with the elastic members 10 to accumulate potential energy (*i.e.*, to store elastic energy) in the elastic members 10 during a loading phase of the device 1, and to transfer the accumulated energy to the projectile during the launch phase.” EX1012, 9:32-10:6. Stanziale '771 does not clearly explain, however, how pushing arms 32 attach to elastic members 10, if at all. EX2029, ¶120. For example, although certain figures appear to show pushing arms 32 connecting to elastic members 10 via element 27, the written description states that “pushing arms 32 are *rotatably associated to the stock 2* through a respective connecting element 27,” not to elastic members 10. *Id.*; EX1012 10:10-11 (emphasis added), Figs. 7, 11-12. At best, it is ambiguous whether pushing arms 32 are attached to elastic members 10 at all. EX2029, ¶121.

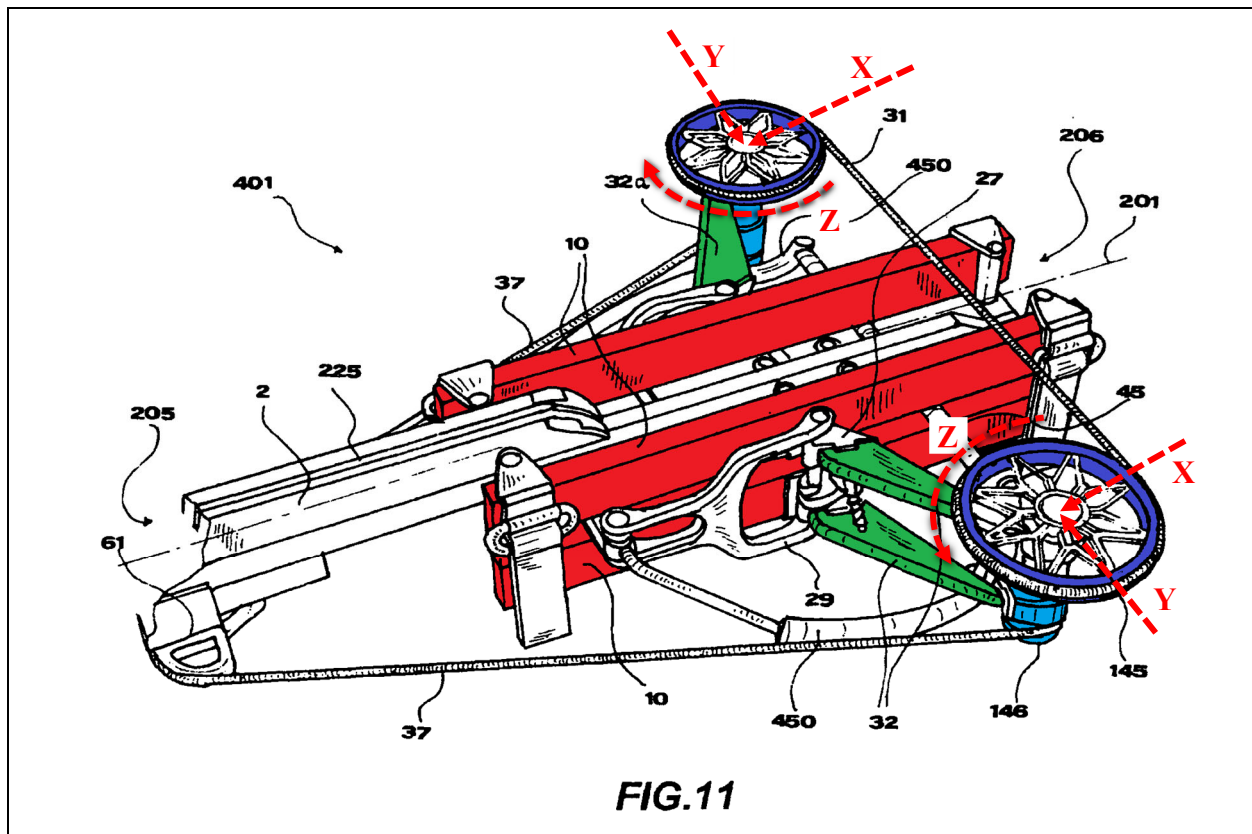
The relationship between pushing arms 32 and connecting element 27 is somewhat clearer—Stanziale '771 teaches that “pushing arm 32 is...rotatably associated with the connecting element 27 thanks to hinge pin 278, said rotation taking place about a respective second rotation axis 93....” EX2029, ¶122; EX1012 13:3-5. Meanwhile, “pulleys 145, 146 are positioned at opposite sides of the pair of pushing arms 32” and “rotate jointly about an axis of rotation 150....” EX2029, ¶123; EX1012, 15:29-30, 16:2-5. As a result, “the pulleys 145, 146 move

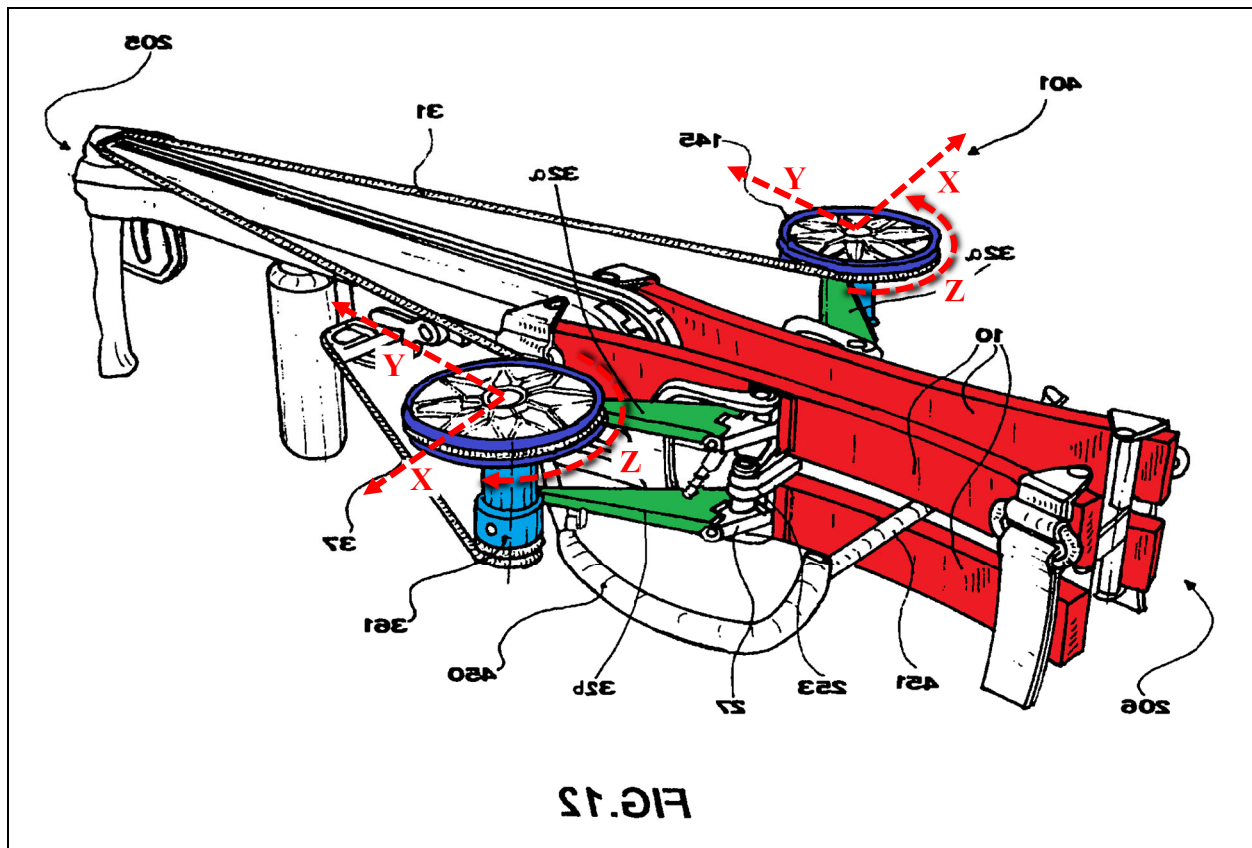
synchronized with the respective pushing arms 32, with ***a combined translation and rotation movement.***” EX2029, ¶124; EX1012, 18:16-18 (emphasis added).

Even assuming pushing arms 32 are attached to elastic members 10 (versus the stock), pulley 145/pulley assembly 145-146-147 is neither physically connected to elastic member 10 nor rotatable only about a vertical axis (axis 150) relative to elastic member 10. EX2029, ¶125. Rather, because it is attached to intervening pushing arms 32, pulley 145/pulley assembly 145-146-147 is both rotatable about a vertical axis and translatable along x- and y-axes due to the pivoting of pushing arms 32 relative to elastic member 10, providing for at least three degrees of freedom between pulleys 145/pulley assemblies 145-146-147 and elastic member 10. *Id.*, ¶¶125-126. In contrast, under the proper construction of “mounted to,” there is only one degree of freedom between the string guide and limb recited in Claim 1. *Id.*, ¶¶68, 116, 127.

Stanziale '771 states “the pulleys 145, 146 move synchronized with the respective pushing arms 32, with ***a combined translation and rotation movement.***” *Id.*, ¶124; EX1012, 18:16-18 (emphasis added). Stanziale '771's pushing arm 32 is a moment arm pivotally mounted to elastic member 10 and provides at least two degrees of freedom between pushing arm 32 and elastic member 10 (*i.e.*, translation along x- and y-axes). *Id.*, ¶126. Pulley 145/pulley assembly 145-146-147 is rotatably mounted to pushing arm 32 and provides an additional degree of freedom (*i.e.*, the

pulley/pulley assembly rotate about a z-axis relative to pushing arm 32). *Id.*, ¶¶125-126. When this linkage of components is viewed as a whole, there are at least three degrees of freedom between the elastic member and the pulley/pulley assembly (*i.e.*, x-axis translation, y-axis translation, and z-axis rotation). *Id.*, ¶126. Figures 11-12, annotated below, show the at least three degrees of freedom of pulleys 145/pulley assemblies 145-146-147 (blue) and their corresponding motion as intervening pushing arms 32 (green) rotate and elastic members 10 (red) move. *Id.*, ¶125.





EX1012, Figs. 11-12 (annotated, Fig. 12 mirrored). Stanziale '771's Figures highlight three degrees of freedom between pulleys 145/pulley assemblies 145-146-147 and elastic members 10. *Id.*, ¶125. This is different from Claim 1, which provides for a single degree of freedom between the string guides and limbs. *Id.*, ¶127; see §IV(A)(2).

When the proper construction of “mounted to” is applied, Stanziale '771 does not disclose “a first string guide mounted to the first bow limb” or “a second string guide mounted to the second bow limb.” Stanziale '771 does not anticipate Claim 1.

3. Petitioner fails to establish motivation to modify Stanziale '771 (Ground 6)

As with Grounds 2 and 4, Petitioner offers the same conclusory and deficient analysis that due to “the helical nature of the journals 1461 means that cable 37 wraps on those journals in one of two directions...[w]ith only two options, it would be obvious to try each.” Petition, 45. For the same reasons Petitioner’s modification to Stanziale ’302 fail, Petitioner fails to establish a motivation to modify Stanziale ’771. *See* §IV(A)(4). Like Stanziale ’302, the presence of pushing arms 32 and elements 27 in Stanziale ’771 between the device’s cams or pulleys and their limbs introduces a number of additional joints or components that are prone to failure or warping when unplanned forces are applied to them. EX2029, ¶¶186-190. The same problematic, vibration-inducing design as Stanziale ’302 will result. *Id.*, ¶188; *see, e.g.*, EX1012 at 22:34-23:1 (describing the device “in a rest condition, in a loaded or charge condition, and in a maximum discharge condition”), Figs. 11-13. Accordingly, a POSA would expect the same problems to arise in the Stanziale ’771 devices as those in Stanziale ’302, yielding unpredictable effects on the Stanziale ’771’s devices’ stability and functionality. EX2029, ¶¶179-191.

Petitioner fails to proffer articulated reasoning based on rational underpinnings for a motivation to modify Stanziale ’771; Stanziale ’771 does not render Claim 1 obvious.

D. Grounds 7-8: Darlington

Grounds 7-8 rely on U.S. Patent Pub. No. 2011/0030666 (“Darlington”) as a primary reference. Because Darlington teaches away from implementing limitations of Claim 1, which Petitioner fails to address, Darlington in view of either U.S. Patent No. 7,578,289 (“Norkus”) (Ground 7) or U.S. Patent Pub. No. 2012/0312287 (“Park”) (Ground 8), Claim 1 is not unpatentable as obvious. EX2029, ¶¶129-145, 192-211.

1. Overview of Darlington

Darlington discloses a compound crossbow directed to increasing accuracy and/or power. *Id.*, ¶47. Darlington teaches that the bowstring and power cables remain “substantially parallel to each other” in both the drawn and relaxed positions while the orientation of the power cables and the bowstring relative to each other remain consistent throughout the draw cycle with the orientation of the power cables and the bowstring in the drawn position “just as” they are in the relaxed position, which eliminates, or in shoot-over configurations, reduces, twisting forces and torque on the limbs to “improve the accuracy of the crossbow.” *Id.*, ¶48. Darlington also teaches that a reverse draw configuration in either a “shoot-through” or “shoot-over” configuration increases the distance the bowstring can be pulled from the relaxed position to the drawn position resulting in an increased power stroke when compared to crossbows with conventional draw configurations. *Id.*, ¶¶48-51.

Petitioner admits that Darlington does not disclose the limitations “that the power cable journals are helical (extending in a direction perpendicular to the draw string planes of rotation), and thus [does not disclose] that the power cables are displaced along the respective axes away from the planes of rotation as the cables wrap onto the helical journals.” Petition, 48.

2. Darlington teaches away from using cams with helical power cable take-up journals to displace the power cables relative to the plane of rotation of the cams

Darlington expressly teaches away from a “crossbow” including “a first helical power cable take-up journal extending in a direction perpendicular to the first plane of rotation of the first draw string journal” and “a second helical power cable take-up journal extending in a direction perpendicular to the second plane of rotation of the second draw string journal,” “wherein as the bow is drawn from the released configuration to the drawn configuration the first and second power cables wrap onto the first and second helical, power cable take-up journals and are displaced along the first and second axes away from the first and second planes of rotation of the first and second draw string journals, respectively.” EX1001, Claim 1. Petitioner ignores this issue. *See* Petition, 48-52.

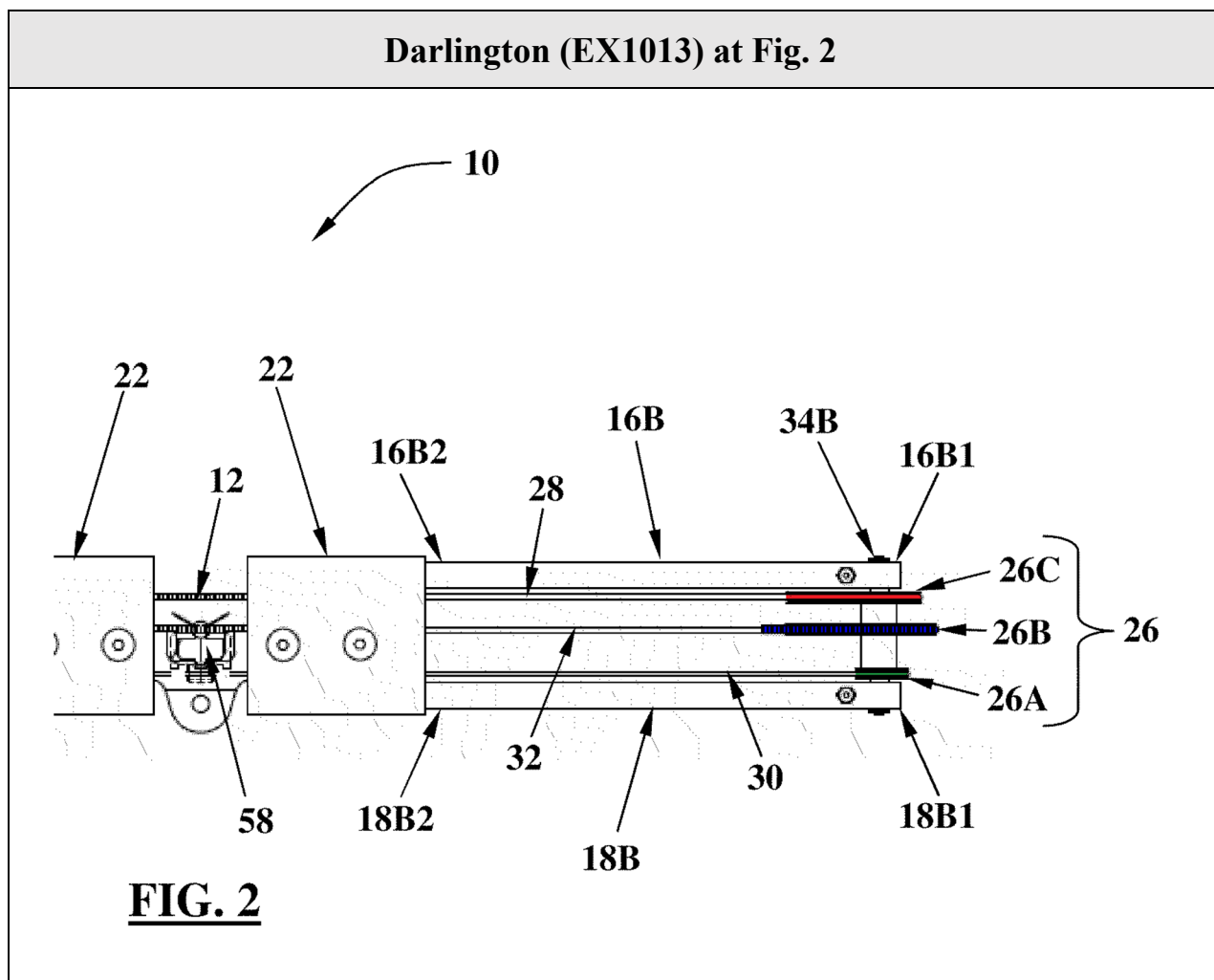
“A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by

the applicant.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 567 F.3d 1314, 1327 (Fed. Cir. 2009) (quoting *Ricoh Co. v. Quanta Computer Inc.*, 550 F.3d 1325, 1332 (Fed. Cir. 2008)). Even where a mere preference might not rise to the level of “teaching away,” it may nonetheless suffice to overcome a motivation to combine. *Polaris Indus., Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1070 (Fed. Cir. 2018).

Darlington uniformly teaches in both the “shoot-over” and “shoot-through” configurations that, for the purposes of accuracy, the power cables and bowstring must be “substantially parallel to each other” at all times while the orientation of the power cables and the bowstring relative to each other remain consistent throughout the draw cycle with the orientation of the power cables and the bowstring in the drawn position “just as” they are in the relaxed position. EX2029, ¶¶132-133. By maintaining these relationships between the bowstring and power cables, Darlington teaches that twisting forces on the bow limbs are eliminated, improving accuracy. *Id.*, ¶¶134, 137. “Ignoring these teachings and allowing the power cable journals to extend perpendicularly away from the drawstring journals and their plane of rotation, as would be done with helical power cable take-up journals, would result in the very ‘twisting forces’ and ‘torque’ on the limbs that Darlington’s teaches as undermining its goal of increased accuracy.” *Id.*, ¶51; *see also id.*, ¶141. Thus, a POSA would have understood that Darlington discourages displacement of power cables away

from the plane of the bowstring because that would decrease accuracy, contravening Darlington's stated purpose of increasing accuracy. *Id.*, ¶138.

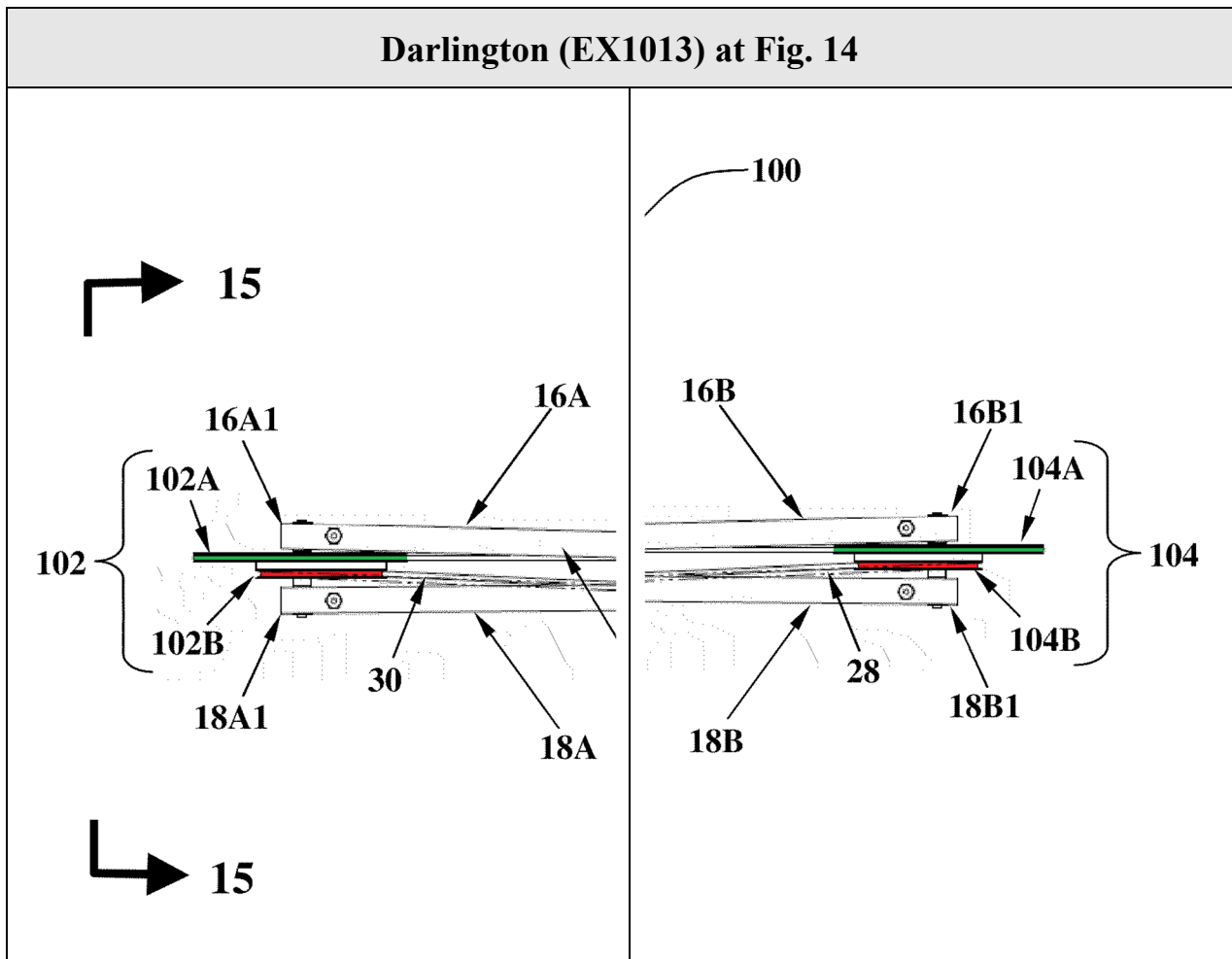
The shoot-through configuration is illustrated below in the annotated excerpt of Figure 2 (showing a shoot-through configuration with first let out groove 26A in green for the first power cable, second let out groove 26B in blue for the bowstring, and take-up groove 26C in red for the second power cable):

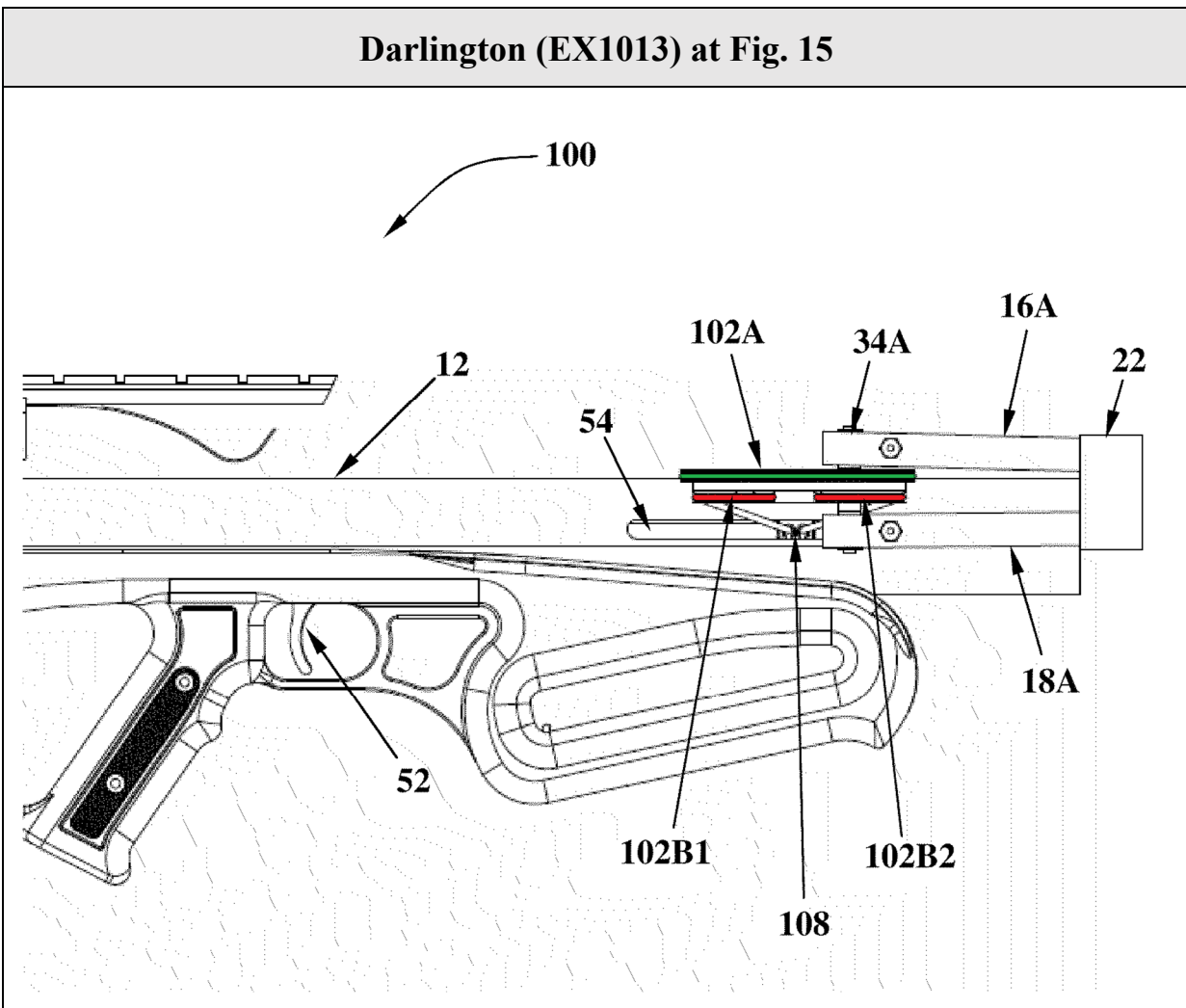


Id., ¶142.

While Darlington's "shoot-over configuration" requires that the power cables be deflected out of the bowstring's path, Darling cautions that deflection "may result in twisting forces being exerted on the limbs." EX2029, ¶139. Thus, to address this issue, Darlington teaches that the "let-out grooves," which let out the bowstring, must be positioned closely to the hybrid grooves, which receive both of the power cables, with one power cable received in a let-out portion and the other power cable received in a take-up portion. *Id.*, ¶140. This close orientation is illustrated in excerpted Figures 14-15 below with the let-out grooves annotated in green and the hybrid grooves in annotated red:

Darlington (EX1013) at Fig. 14





Id.

Darlington teaches that displacement of the power cables relative to the bowstring still results in acceptable accuracy, while providing for a shoot-over configuration, only when the orientation of the power cables and drawstring is consistent throughout the draw cycle and when using with a hybrid two-groove cam in which the let-out groove is disposed close to the hybrid groove of each cam. *Id.*, ¶135. Darlington further teaches that hybrid grooves 102B, 104B (i.e., the power

cable take-up journals) should not extend away from the plane of rotation of let-out grooves 102A and 104A (i.e., the first and second drawstring journals) because doing so would increase twisting forces and torque on the limbs and is contrary to Darlington's goal of increased accuracy. *Id.*, ¶140. Specifically, in a shoot-over configuration, Darlington teaches that, for both cams, the "let-out grooves" must be disposed close to the hybrid grooves. *Id.*, ¶142. "Doing so ensures that the forces exerted by the power cables and bowstring on the cam and therefore the limb the cam is attached to are exerted in consistent directions throughout the draw cycle, rather than varying direction as the bowstring transitions between the relaxed position and the drawn position. Allowing the hybrid grooves to extend away from the let-out grooves, such as by implementing a helical groove structure, would significantly harm Darlington's stated goal of improved accuracy by introducing more torque and varying forces on the limbs than Darlington deemed to be acceptable for a shoot-over configuration of a crossbow." *Id.*, ¶140. As such, a POSA would have understood that Darlington teaches away from displacing the power cables from the planes of rotation of the draw string journals through the use of helical power cable take-up journals extending in a direction perpendicular to the draw string journals' plane of rotation. *Id.*, ¶¶143-145.

3. Petitioner fails to establish motivation to modify Darlington with Norkus (Ground 7) or Park (Ground 8)

a. Any purported increased power stroke in the combination bows is speculative at best

With respect to Norkus, rather than articulated reasoning based on rational underpinnings, Petitioner offers only conclusory statements that a POSA would be motivated to combine Darlington with Norkus because “Darlington teaches the desirability of ‘a higher level of stored energy’ and increased power stroke (*i.e.*, the distance of travel of the bowstring between the drawn and released configurations), which ‘results in better performance,’” and “Norkus likewise teaches the desirability of more energy storage, which is directly impacted by increased power stroke.” Petition, 49. Similarly, Petitioner’s combination theory of Darlington with Park is predicated on a “wish[] to increase a crossbow’s power stroke, ” (Petition, 51), nothing more.

Petitioner’s cited teachings in Darlington would not have taught a POSA to modify or replace Darlington’s cams with cams with helical power take-up journals from either Norkus or Park. EX2029, ¶¶197-203. Darlington is clear that it is the reverse draw configuration of a crossbow, not any particular design of the cams, that increases power stroke relative to a crossbow with a conventional draw configuration. EX1013, [0015], [0042]; EX2029, ¶198. In the Background of the Invention, Darlington is merely describing improvements found in the cam systems

of prior art crossbows, not improvements made in Darlington's crossbow. EX1013, [0003].

Even crediting Petitioner's argument, Petitioner fails to provide any explanation of the additional modifications to the crossbow of Norkus (or Park) that would be necessary to actually increase the power stroke of the theoretical crossbows. The cams of Norkus and Park only provide for the possibility of an increased power stroke on their own. But the power stroke is limited by the actual movement of the bowstring between the drawn and relaxed positions. To actually increase power stroke, the crossbow of Darlington would need further modifications to move the drawn position further away from the relaxed position – Batzer is silent on such modifications despite conceding that “[e]very component has to be designed to work in combination with the others.” EX1030, 185:4-6.

At minimum, modifications would include lengthening the barrel or stock of the crossbow, resulting in a longer crossbow, which is inherently more unwieldy and less accurate than a shorter crossbow. EX2029, ¶204. And, such modifications, per Batzer, may make the bow “worse:”

Q. Is it always the case that if you increase the power stroke distance, you improve a crossbow's performance?

A. All other things being equal, that would be true. But when you do that, you do have to maintain that everything

is in balance. You can't simply increase the crossbow draw length without other -- without validating that there is not some unanticipated consequence with the crossbow.

Q. How do you know that is the case?

A. As a mechanical engineer, I know that, that when you make a change, you still have to go through your validation process. . . . But when you change fasteners and things, sometimes what you have is, I need a stronger fastener, and then instead of a fastener breaking, an underlying part will break that is more expensive than the fastener. So you have just, by making a fastener that doesn't break, that you paid when it broke, **you have made your overall product worse. So you could imagine how increasing the power stroke could increase the energy and decrease the accuracy because you didn't make a compensatory change.**

EX1030, 229:2-230:7 (emphasis added); *see id.*, 185:4-6. This too is speculative because Batzer did not explain how Norkus or any Darlington combination would be effectively "cross-pollinated." *Id.*, 182:21-183:5.

b. The combination bows ignore Darlington's accuracy goal

The Petition and Batzer are silent on the importance of accuracy to Darlington and how accuracy may be impacted (or not) by the proposed Norkus or Park

combinations. Indeed, the Petition and Batzer fail to address how the theoretical combination crossbows would combat the increased twisting forces on the limbs that would result from such displacement of the power cables from the bowstring plane and thus negatively impact accuracy. EX2029, ¶198. And Petitioner cites to nothing in Norkus or Park to indicate how their cams contribute to accuracy (or not).

c. Petitioner's combination bows ignore Darlington's hybrid cam disclosure and its impact on cam synchronization

Darlington teaches that “the hybrid two-groove cam configuration [of the shoot-over configuration] also provides the benefit of improved cam synchronization.” EX1013, ¶[0060]. Petitioner fails to provide any explanation of whether or how the cams of Norkus or Park can function like Darlington hybrid two-groove cams in which a single hybrid groove must accept both power cables. Notably, Petitioner refers to hybrid grooves 102B and 104B merely as “grooves”, omitting “hybrid” in an apparent attempt to ignore, or at least minimize, Darlington's teachings as to the hybrid function of these particular grooves necessary to practice Darlington's invention as Darlington intended.

Darlington's particular hybrid two-groove cam system is essential to implementing a crossbow with a shoot-over configuration (as identified by Petitioner) with the improved accuracy and improved cam synchronization taught by Darlington. EX2029, ¶¶132, 139-140. Each hybrid two-groove cam must be

arranged with the let-out grooves (the first groove of the cam) disposed close to the hybrid grooves (the second groove of the cam) to achieve an acceptable improvement of accuracy under the teachings of Darlington. *Id.*, ¶¶136, 200. The hybrid grooves themselves must include both a let-out portion for receiving one power cable and a take-up portion for receiving the other power cable with each power cable attached at one end to the first cam and at the other end to the second cam to sync the two cams together in a manner that improves cam synchronization. *Id.*

Similar to Petitioner's omission of "hybrid" when identifying grooves 102B and 104B, Petitioner's description of Darlington's power cables 28, 30 wrapping onto power cable journals 102B and 104B omits that (1) as the first power cable wraps onto the take-up portion of the hybrid groove of the first cam, the other end of the first power cable is, at the same time, unwinding from the let-out portion of the hybrid groove of the second came and (2) as the second power cable wraps on to the take-up portion of the hybrid groove of the second cam, the other end of the second power cable is, at the same time, unwinding from the let-out portion of the hybrid groove of the first cam. Petition, 48; EX2029, ¶¶136, 206. Petitioner provides no explanation of whether or how this essential functionality of Darlington's hybrid grooves could be provided by the helical journals of the cams of Norkus or Park to

provide even basic cam synchronization, much less the improved cam synchronization taught by Darlington.

d. Petitioner fails to weigh the benefits lost and gained by the combination bows

As the Board noted when evaluating whether a particular reference teaches away from combination with a second reference, “the benefits, both lost and gained, should be weighed against one another.” Decision, 32 (quoting *Winner Int’l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 n.8 (Fed. Cir. 2000)). Here, Petitioner failed to engage in this fundamental requirement.

Darlington explains at length the advantages in accuracy provided in its crossbow in either shoot-over or shoot-through configurations, which also has the benefit of cam synchronization. EX2029, ¶¶132-144, 199-207. Darlington also explains that increased power stroke can be achieved using a reverse draw configuration, rather than a conventional draw configuration, while still reaping the benefits of improved accuracy and cam synchronization provide by Darlington’s cam systems. *Id.*, ¶198. Petitioner offers no reasoning why a POSA would have exchanged the advantages of accuracy and cam synchronization provided by Darlington’s cams for the mere potential for an increased power stroke provided by the cams of Norkus or Park. Petition, 49-52. Indeed, Petitioner completely fails to weigh the benefits of Darlington that would have been lost by substituting Norkus’s

or Park's cams for Darlington's. *Winner*, 202 F.3d at 1349 n.8. Petitioner also fails to explain why a POSA would have valued the capability to increase power stroke more than improved accuracy or improved cam synchronization.

A POSA would have found both Norkus's and Park's cams wanting when compared to Darlington's cams, as using either Norkus's cams or Park's cams, would have required the POSA to sacrifice improved accuracy and improved cam synchronization for the mere *possibility* of increasing the power stroke of Darlington's crossbow. EX2029, ¶¶206-207. No POSA would make such a combination when Darlington itself teaches that is possible to have improved accuracy, improved cam synchronization, and increased power stroke over conventional crossbows by using Darlington's cams in a crossbow arranged in a reverse draw configuration. *Id.*, ¶205. Petitioner provides no credible rationale—likely because there is none—for why a POSA would have sacrificed the known benefits of improved accuracy, improved cam synchronization, and increased power stroke in a crossbow with a reverse draw configuration as taught by Darlington to create a combination bow with decreased accuracy and a decrease in or no cam synchronization (with its attendant problems) for the possibility of increased power. *Id.*, ¶¶205, 208-210.

Because Petitioner fails to provide an explanation that properly weighs the benefits lost and gained in substituting the cams of Norkus or Park for the cams in

Darlington's bow and because a proper weighing of the benefits only highlights that the benefits of Darlington outweigh the potential benefits of the Norkus and Park combination bow, Claim 1 is not obvious.

4. Petitioner improperly uses hindsight

Petitioner applies improper hindsight bias rather than articulating a reasonable rationale as to why a POSA would be motivated to combine Darlington with Norkus or Park. *See Metalcraft of Mayville, Inc. v. The Toro Co.*, 848 F.3d 1358, 1367 (Fed. Cir. 2017) (“[W]e cannot allow hindsight bias to be the thread that stitches together prior art patches into something that is the claimed invention.”); *InTouch Techs., Inc. v. VGO Commc'ns, Inc.*, 751 F.3d 1327, 1352 (Fed. Cir. 2014) (finding hindsight bias where expert testimony “primarily consisted of conclusory references to [the] belief that one of ordinary skill in the art *could* combine these references, not that they *would* have been motivated to do so”) (original emphasis).

Batzer admitted he used Patent Owner's crossbows that purportedly practice Claim 1 as a roadmap for his opinion that the combinations of bows in his declaration and Petition would work:

Q. What is the basis for your statement that you are confident that your proposed combination bows in the various grounds are operable?

A. If a technology works for Norkus and it works for Ravin, which it does, it would work moving Norkus over as a new aspect of the Darlington bow. Though, of course, engineering and analysis would have to be done. You can't simply cut and paste from one into the other without having compensatory design changes.

EX1030, 183:11-21. Petitioner's impermissible use of hindsight does not provide a motivation to combine. Moreover, Batzer is wrong—Ravin's crossbows do not practice Claim 1. EX2012, 9-11. At minimum, Ravin's crossbows are not a reverse draw configuration. *Id.*

When the relevant teachings of Darlington, Norkus, and Park are properly considered in their entirety from the POSA's point of view, the only conclusion is that a POSA would not have combined Darlington and Norkus or Darlington and Park to render the crossbow of Claim 1 obvious.

E. Grounds 9-11: Kempf '871

Grounds 9-11 rely on U.S. Patent No. 7,836,871 ("Kempf '871") as a primary reference. Kempf fails to disclose certain limitations of Claim 1, which Petitioner does not argue are found in Norkus (Ground 9), Park (Ground 10), or Stanziale '302 (Ground 11). Thus, Kempf '871 in view of any of Norkus, Park, or Stanziale '302 does not render Claim 1 obvious.

1. Overview of Kempf '871

Kempf '871 discloses a reverse-draw crossbow described as having “a low-cost, simple manufacture,” “a compact, lightweight construction,” “a reduced ratio of the axle-to-axle distance to the powerstroke,” “reduced maintenance requirements,” “an increased power stroke,” and other advantageous features. EX2029, ¶¶52-56; EX1016 at Abstract, 2:39-55.

2. Kempf '871 does not disclose “the second string guide comprising a second draw string journal”

Kempf '871 does not disclose “the second string guide comprising a second draw string journal” as required by Claim 1. EX2029, ¶¶146-153. Petitioner admits Kempf '871 teaches a crossbow design with a first string guide in the form of a pulley (28) and second string guide in the form of a cam (36). EX1014, 3:57-59, 3:64-66; *see* Petition, 53. Petitioner argues that Kempf '871 discloses the dual requirements of “the first string guide comprising a first draw string journal...” and “the second string guide comprising a second draw string journal...,” by claiming pulley (28) and cam (36) “ha[ve] a draw string journal (called outer track) 30....” Petition, 54. Yet Kempf '871 only discloses outer track (30) as part of pulley (28)—the first string guide. EX2029, ¶150; EX1014, 3:57-59, Fig. 1. The cam (36)—the second string guide—does *not* have an outer track (30). EX2029, ¶150; EX1014, 3:64-66, Fig. 1. Thus, as to Kempf '871's primary embodiment, Petitioner's

argument that “[e]ach string guide has a draw string journal (called outer track) 30” is wrong. EX2029, ¶153.

Petitioner's reliance on Kempf '871's alternative embodiment also fails. This alternative embodiment provides that “two synchronized *cams*...may be used in place of the cam (36) and pulley (28).” *Id.*, ¶151; EX1014, 4:12-13 (emphasis added); *see also* Petition, 53 (“Figure 1 shows a pulley 28 and a cam 36 as the string guides, *but two cams may also be used.*”). But Kempf '871 never discloses or suggests an embodiment using two *pulleys*. Because Kempf '871 only discloses outer track (30) as part of pulley (28) but never discloses an embodiment with two pulleys (28), Kempf '871 cannot disclose two outer tracks (30). EX2029, ¶152. By extension, Petitioner's argument that Kempf '871 discloses “a second draw string journal” in the form of a second outer track (30) falls short, as the Board acknowledges. Decision, 35

3. Kempf '871 does not disclose “the second string guide comprising...a second helical power cable take-up journal”

Kempf '871 does not disclose “the second string guide comprising... a second helical power cable take-up journal.” EX2029, ¶154-159. Petitioner admits that Kempf '871 fails to disclose “power cable take-up journal[s]” that are “helical” and that “extend[] in a direction perpendicular to the first [or second] plane of rotation of the first [or second] draw string journal.” Petition, 54-55. Nevertheless, Petitioner

argues that Kempf '871 discloses two "power cable take-up journal[s]." *Id.* This is incorrect.

Petitioner identifies a pair of inner tracks (32) as Kempf '871's two "power cable take-up journal[s]." *Id.*, 54. Inner track (32) is only ever disclosed as part of pulley (28), not cam (36). EX2029, ¶156; EX1014, 3:57-59, 3:64-66, Fig. 1. As with outer track (30), neither Kempf '871's primary embodiment (teaching one pulley (28) and one cam (36)) nor its alternative embodiment (teaching two cams) discloses two inner tracks (32). EX2029, ¶¶156-158; EX1014 at 3:57-59 ("Coupled to the first limb (24) is a first string guide, which in the preferred embodiment is a pulley (28), having an outer track (30) and an inner track (32)."); *see also id.* at 3:64-4:19 (discussing cam (36) and not disclosing any outer track (30)), Fig. 1 (showing only one outer track (30), located on pulley (28)), Fig. 10 (same). As Kempf '871 does not teach a two pulley (28) configuration and the cam (36) is not described as having an inner track, there is no disclosure or teaching in Kempf '871 that would allow for a second string guide having a second power cable take up journal. EX2029, ¶159.

Likewise, Kempf '871's alternative embodiment does not disclose the missing second inner track (32). *Id.*, ¶157. Kempf '871's alternative embodiment provides that "two synchronized cams...may be used in place of the cam (36) and pulley (28)." EX1014, 4:12-13 (emphasis added). However, as previously discussed, only pulley (28) has an inner track (32); cam (36) does not. EX2029, ¶158. There is

nothing in Kempf '871 to suggest that the “two synchronized cams” in the alternative embodiment would incorporate an inner track (32). *Id.* In fact, given that inner track (32) is described as a component of a pulley (not a cam), a POSA would almost certainly conclude that the cams would not have such a feature. *Id.* Accordingly, a POSA would also readily understand that the dual-cam alternative embodiment would have no inner track (32) to correspond to either the claimed first string guide or the claimed second string guide. *Id.*

By extension, Petitioner's argument that Kempf '871 discloses “a second...power cable take-up journal” in the form of a second inner track (32) must fail for the same reasons as its “second draw string journal” arguments. Decision, 26; EX2029, ¶159.

4. Petitioner fails to establish motivation to combine Kempf '871 with Norkus (Ground 9), Park (Ground 10), or Stanziale '302 (Ground 11)

Petitioner advances similarly deficient motivation to combine arguments regarding Kempf '871 with any of Norkus, Park, or Stanziale '302, as it did for combining Darlington with Park and Norkus. As with its theoretical Darlington combinations, Petitioner argues that a POSA would seek to modify Kempf '871 with the helical power cable journal disclosed in Park, Norkus, and Stanziale '302 to meet the helical power cable take-up journal extending in a direction perpendicular to the planes of rotation of the draw string journal and where the power cables displace

away from the planes of rotation of the draw string journals. Petition, 55-56. Petitioner is wrong. Merely because these references may have overlapping teachings regarding “the desirability of increasing a crossbow’s draw length or power stroke, which increases its potential power and thus speed,” (Petition, 55-58), this is insufficient motivation for a POSA to combine Kempf ’871 with each of these references.

Neither Petitioner nor Batzer—whose declaration simply repeats Petitioner’s arguments *verbatim* (compare Petition, 55-58 with EX1016, ¶¶227, 232, 238-240)—explain why a POSA would be motivated to combine Kempf ’871 specifically with any of the secondary references. Such undeveloped arguments, supported only by expert “testimony” that is entitled to virtually no weight, should be rejected. *Daifuku Co., v. Murata Machinery, Ltd.*, IPR2015-01541, Paper 11, 21 (PTAB Jan. 20, 2016) (citing *ActiveVideo Networks, Inc. v. Verizon Commc’ns, Inc.*, 694 F.3d 1312, 1327 (Fed. Cir. 2012)); *see also Samsung*, Paper 11, 12-13. Thus, for the same reasons Petitioner failed to articulate a motivation to combine Darlington with Park or Norkus, Petitioner fails to explain how the proposed combinations of Kempf ’871 with any of Park, Norkus, or Stanziale ’302 would achieve the desired result. *See* §IV(D)(3); EX2029, ¶¶212-222.

F. Ground 12: Islas

U.S. Patent Pub. No. 2011/0308508 (“Islas”) in view of Darlington and Park does not render Claim 1 unpatentable as obvious. Ground 12 fails because Islas teaches away from the proposed combination with Darlington, resulting in a crossbow inoperable for its intended purpose. EX2029, ¶¶160-178, 223-235.

1. Overview of Islas

Islas discloses “[a] compound bow or crossbow....” EX1015 at 1, Abstract. Islas teaches a simple crossbow in a standard, forward-draw configuration in which the bow string sits between the two power cables at the bowstring cams but above the two power cables at the stock. EX2029, ¶¶57-60. The power cord and related anchor points and positioning, including the spacing and related separation of power cords, eliminates similarities of other designs, particularly the ’015 Patent. *Id.*, ¶61. The Islas design teaches that cam grooves that are flared in respect to the cam axle creating an extension far beyond the central axle point and do not purport a singular groove, placed on either side of the cam limiting degrees of rotation. *Id.*

2. Converting Islas from a forward-draw to a reverse-draw configuration results in an inoperable device

Petitioner admits that, in Islas, the “bowstring is not secured in a reverse draw configuration (with the string adjacent the down-range side of the string guides 20 in a released configuration, such that the string translates from the down-range side toward the up-range side while being drawn).” Petition, 60. This means that Islas

fails to disclose “a draw string...secured to the crossbow in a reverse draw configuration with the draw string adjacent the downrange side of the string guides in a released configuration, wherein the draw string translates from the down-range side toward the up-range side....” EX1001, Claim 1.

To overcome this deficiency, Petitioner argues that it would have been obvious to modify Islas's forward-draw crossbow design to incorporate the reverse-draw crossbow designs of Darlington. Petition, 60-61. But even Batzer does not believe this is credible—Batzer concedes that a reverse-draw crossbow cannot simply be taken apart and put back together as a forward-draw crossbow without “compensatory design changes,” which Batzer fails to identify. EX1030, 190:5-191:5; EX2030 284:5-13; EX2029, ¶164. A POSA would appreciate that Petitioner's theoretical combination bow requires a complete reconstruction to convert the forward draw crossbow of Islas to a reverse draw crossbow. EX2029, ¶165.

Petitioner, in making its argument, fails to acknowledge that modifying Islas's crossbow to have a reverse-draw configuration would render the crossbow inoperable for its intended purpose. *Id.*, ¶163. This, in turn, means Islas and Darlington teach away from Petitioner's proposed combination. *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 1354 (Fed. Cir. 2001) (“If references taken in

combination would produce a ‘seemingly inoperative device,’...such references teach away from the combination....”) (citation omitted).

Islas teaches:

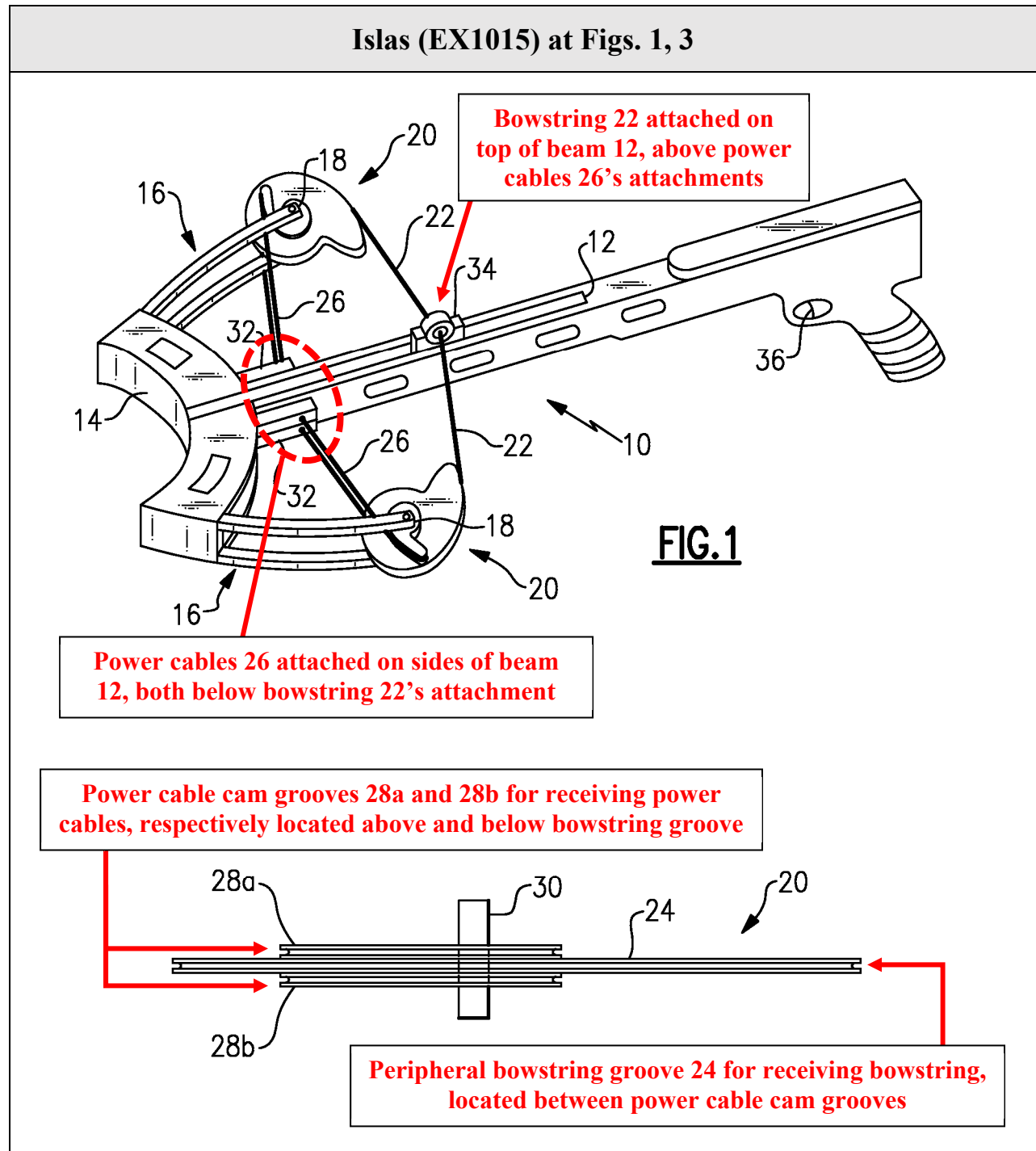
A bow string 22 is attached to each bowstring cam 20 and rides in a peripheral bowstring groove or channel 24 in each of these cams.... At each limb there are a pair of power cables 26 are reeved to respective power cable cam grooves 28 a and 28 b that are coaxial with the associated bowstring cam groove 24, and are situated axially above and below the same.... The other ends of the power cables 26 are affixed at anchor points, here in the form of rigid pylons 32 affixed onto the riser, and projecting proximally (toward the archer position or handle end of the crossbow). In other possible embodiments, the anchor points may be on the beam or stock 12. Importantly, the power cords 26 do not cross the medial plane of the bolt or arrow, and do not travel against one another nor travel on or against any mechanical parts such as pulleys....

Also shown here is a traveling string release 34 mounted on a track on the top of the beam 12. This release can closed over the bow string and then cranked back to a full draw position....

EX1015 at ¶¶[0013]-[0014].

As shown in Figures 1 and 4, Islas teaches that the power cables are attached on either side of the bowstring's attachment point at the cams (i.e., one above and one below) but are both attached below the bowstring's attachment point at the stock.

Islas (EX1015) at Figs. 1, 3



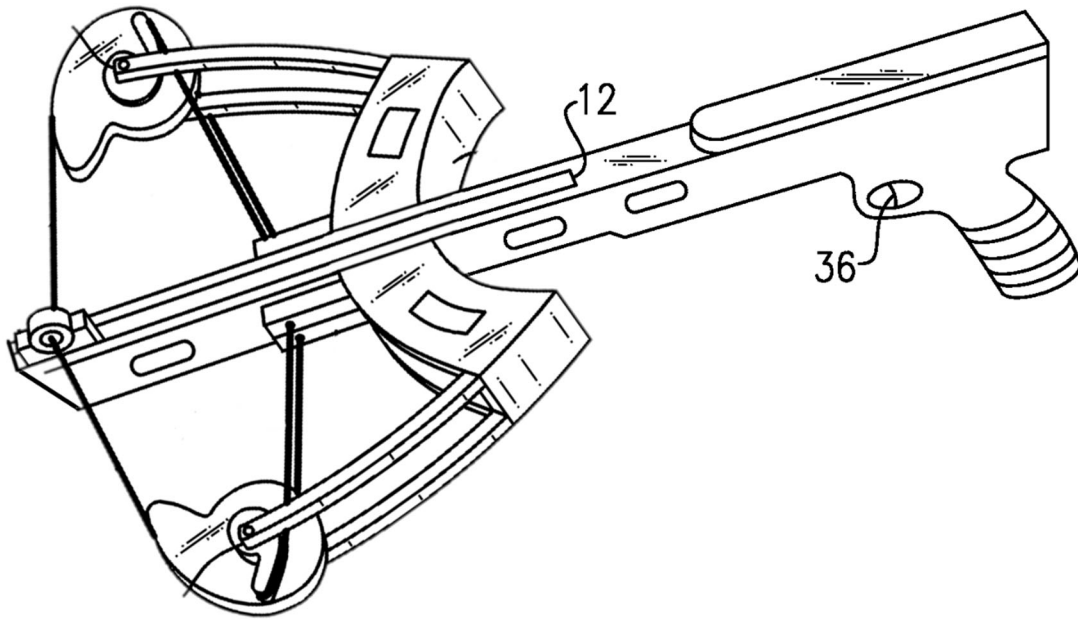
EX2029, ¶167.

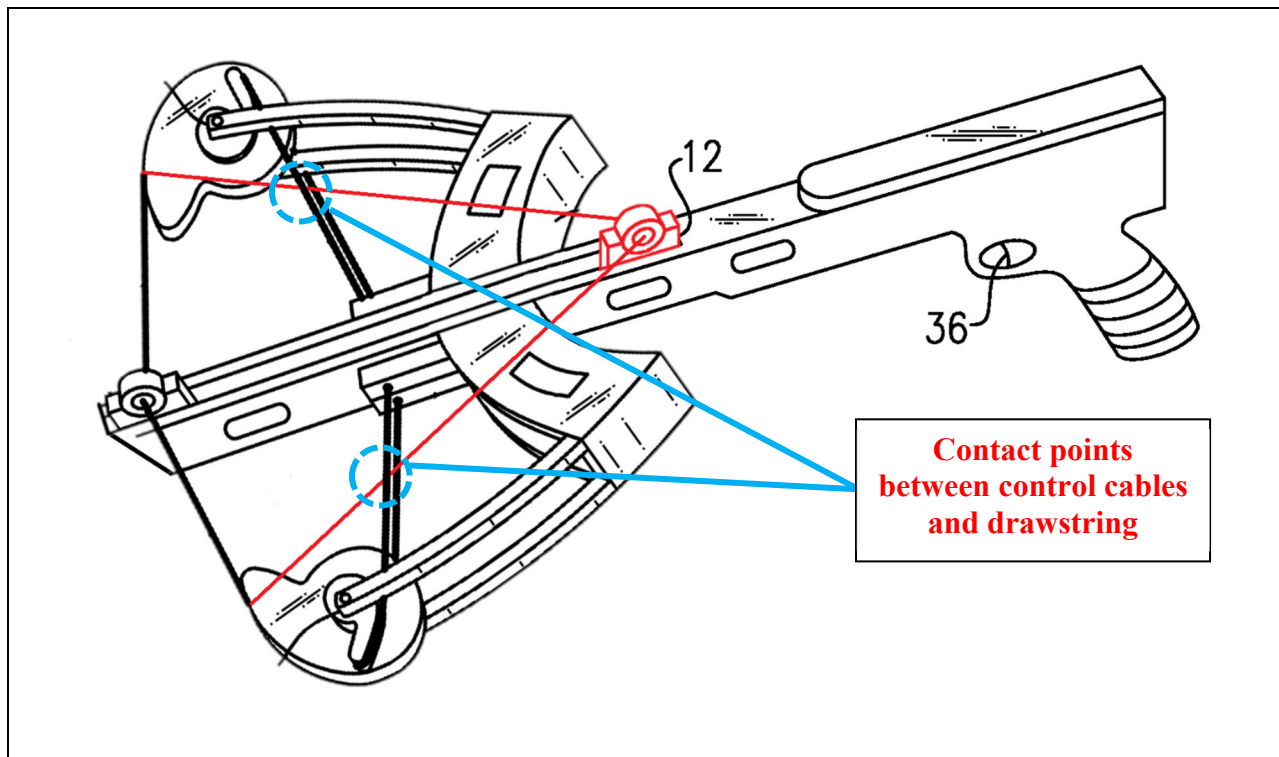
Because of this configuration of the power cable and drawstring attachment points, if the Islas device were “simpl[y]” reconfigured so that “the string [is] adjacent the down-range side of the string guides 20 in a released configuration, such that the string translates from the down-range side toward the up-range side while being drawn” as Petitioner argues, a POSA would have understood that the device would not be able to function. *Id.*, ¶¶168-173. Because the drawstring, which would still be attached above the attachment points for both power cables at the stock (now at the down-range side of the device) but attached between the power cables at the cams (now up-range), would necessarily come into contact with the power cables before the bow can reach its full-drawn position. *Id.*, ¶¶168-169.

Darlington explains that reverse-draw configurations require a “shoot-through configuration,” *i.e.*, a configuration where the bowstring is “vertically disposed in between the first power cable 28 and the second power cable 30,” which “allow[s] the bowstring 32 to be pulled away from the riser 20 and through the first power cable 28 and second power cable 30.” EX2029, ¶175; EX1013, ¶[0041]-[0042]. In Islas, however, the bowstring is positioned on top of the stock and therefore above the power cables, not between them. EX2029, ¶176; EX1015, Fig. 1, ¶[0014] (bowstring’s string release 34 is “mounted on a track on the top of the beam 12”). A POSA would recognize that attempting to implement Darlington’s reverse-draw

configuration in Islas would result in interference between the power cables and the drawstring as the crossbow is drawn and the drawstring is forced to cross and tangle with the upper power cables as illustrated below. EX2029, ¶¶169, 172-174.

Patent Owner-Generated, Modified Islas Figure 1





In addition to interference between the power cables and drawstring, the cams in Islas are designed to rotate in one direction, but if used in a reverse-draw configuration, the cams would have to rotate in the opposite direction. *Id.*, ¶171. What Petitioner fails to consider is that the Islas cams cannot rotate in the opposite direction because the power cable would prevent that rotation—the cams would not rotate at all if configured as Petitioner suggests. *Id.* Petitioner is silent on this point.

3. Petitioner fails to establish motivation to combine Islas with Darlington and Park (Ground 12)

As discussed above, Islas and Darlington teach away from each other and Darlington teaches away from displacing the power cables from the bowstring plane as disclosed in Park. *See* §IV(F)(2), §IV(D)(2)-(3). Petitioner says nothing as to how

any motivation to combine overcomes these layers of teachings that would have directed the POSA to avoid combining the forward-draw crossbow of Islas with the reverse-draw bow of Darlington, and any helical power cable journal of Park. Petitioner's argument for combining Islas with Darlington and Park cannot overcome these significant problems. EX2029, ¶¶223-234.

Much as with the Darlington-Norkus and Darlington-Park combinations, Petitioner's argument in Ground 12 is that both Islas and Darlington teach "the desirability of increasing crossbow speeds..., and thus a POSA would be motivated to modify Islas's crossbow to implement the reverse-draw configuration of Darlington to increase the power stroke and resulting speed." Petition, 60. However, Darlington discloses a synchronized cam design that is incompatible with the non-synchronized cam design of Islas. EX2029, ¶¶224-226. Thus, a POSA would not have been motivated to implement the synchronized cam system of Darlington in the non-synchronized system of Islas because there was no way to predict, at least without significant and time-consuming testing, whether this combination would work. *Id.*, ¶226.

Neither Petitioner nor Batzer—who simply repeats Petitioner's arguments *verbatim* (compare Petition, 60 with EX1016, ¶250)—identify any specific changes a POSA would make to implement Darlington's reverse-draw configurations in Islas. EX2030, 284:5-13. Rather, Petitioner simply pronounces "the simplicity of

making such a modification,” (Petition, 60), without acknowledging the fundamental structural differences between Islas and Darlington that make this combination anything but simple. Such a superficial argument, supported only by conclusory expert “testimony” entitled to virtually no weight, cannot establish a motivation to combine Islas with Darlington, particularly where Petitioner fails to address (in)operability. *Daifuku*, Paper 11, 21 (citing *ActiveVideo*, 694 F.3d at 1327); *see also Samsung*, Paper 11, 12-13. Moreover, here again, Petitioner fails to explain how the proposed combination would achieve the desired result. *See* §IV(D)(3).

Because Petitioner fails to offer articulated reasoning based on rational underpinnings for a motivation to modify Islas with Darlington and Park, this combination does not render Claim 1 obvious.

Dated: October 18, 2023

Respectfully submitted,

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CERTIFICATE OF COMPLIANCE

This Patent Owner Response complies with the type-volume limitations required by 27 C.F.R. §42.24. The word count in this paper totals 13,467 words. Patent Owner has relied upon the word count feature of Microsoft Word.

Dated: October 18, 2023

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing **Patent Owner's Response Pursuant to 37 C.F.R. §42.120** was served on October 18, 2023, by email to Petitioner's counsel of record:

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