

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BOWMAR ARCHERY LLC
Petitioner,

v.

VETERAN'S INNOVATIVE PRODUCTS, LLC
Patent Owner.

Patent No. 8,043,177
Filing Date: July 7, 2008
Issue Date: October 25, 2011
Title: ARROWHEAD HAVING COLLAPSIBLE AND OUTWARDLY BIASED
BLADES

Inter Partes Review No.: IPR2024-00401

DECLARATION OF TODD A. KUHN, PH.D.

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I, Todd A. Kuhn, Ph.D., declare as follows:

I. INTRODUCTION AND QUALIFICATIONS

1. I have been retained by Petitioner Bowmar Archery LLC to assess U.S. Patent No. 8,043,177 (“the ‘177 patent”). I am being compensated for my time at a rate of \$250.00 USD per hour, plus actual expenses. My compensation is not dependent in any way upon the outcome of Petitioner’s petition.

2. I have been asked to offer opinions as an expert regarding invalidity of claims 1-4, 7, 9, 11, 12, 15, and 17 of the ‘177 patent from the perspective of a person having ordinary skill in the art (“PHOSITA”). Claims 1-4, 7, 9, 11, 12, 15, and 17 of the ‘177 patent generically and broadly recite a broadhead for an arrow having a pair of blade members pivotally interconnected with the broadhead, and a biasing member, or spring, that biases the blade members toward an extended position. Since broadheads for an arrow having a pair of blade members pivotally interconnected to the broadhead, and a biasing member, or spring, that biases the blade members toward an extended position were known in the art, my opinion is that claims 1-4, 7, 9, 11, 12, 15, and 17 of the ‘177 are invalid for anticipation and obviousness, as detailed in my analysis of Grounds I-V set forth below.

3. Ground I: In my opinion, claims 1-4, 7, 9, 11, 12, 15, and 17 of the ‘177 are invalid for anticipation over U.S. Patent No. 3,168,313 (“Lint”), as Lint discloses every requirement of these claims.

4. Ground II: In my opinion, claims 11, 12, 15, and 17 are invalid for anticipation over U.S. Patent No. 8,016,704 (“Vandewater”), as Vandewater discloses every requirement of these claims.

5. Ground III: In my opinion, claims 1-4, 7, 9, 11, 12, 15, and 17 of the ‘177 are invalid for obviousness because every requirement of these claims are disclosed in Lint in combination with U.S. Patent No. 2,806,317 (“Minisini”) and/or U.S. Patent No. 2,212,345 (“Krieger”).

6. Ground IV: In my opinion, claims 11, 12, 15, and 17 of the ‘177 are invalid for obviousness because every requirement of these claims are disclosed in U.S. Patent No. 3,600,835 (“Hendricks”) alone or in combination with the knowledge of a PHOSITA.

7. Ground V: In my opinion, claims 1-4, 9, 11, 12, and 17 are invalid for anticipation over U.S. Patent No. 6,287,224 (“Liechty, II”), as Liechty, II discloses every requirement of these claims.

II. PERSONAL AND PROFESSIONAL BACKGROUND

8. I have been involved in the engineering, design and development of archery products, including broadheads, for most of my professional career. I have also been shooting bows and crossbows for over 50 years and have developed expertise relating to the design and function of archery products, including broadheads.

9. My formal education began with a Bachelor of Arts, as well as a Masters of Arts, in Audiology from the University of Central Florida. I received a Ph.D. in Environmental Engineering from Columbia Southern University, College of Engineering.

10. I founded and operated two archery accessories companies, Mid-Atlantic Archery Products, LLC and 2XJ Enterprises, Inc., from approximately 2002 to 2012. As part of those companies, I was exclusively responsible for the design and development of new and innovative broadheads, including for example broadheads sold under the brand “Crimson Talon.” Several broadhead products that I developed earned “*Best of the Best*” and “*Best New*” awards from national publications.

11. I contributed directly to and am a named inventor on approximately nineteen United States utility patents, many of which are related to archery technology, specifically broadheads.

12. I have licensed numerous patents to manufacturers with products appearing at retail in, but not limited to, *Wal-Mart*, *Cabela’s*, *Bass Pro Shops*, *Dick’s Sporting Goods*, *Academy Sports*, *Gander Mountain*, *Scheels*, *Field & Stream*, *Tractor Supply*, *Canadian Tire*, *Sport’s Authority* and others.

13. I have served as an editor and journalist for several trade publications covering the business of bowhunting and other outdoor related topics from

approximately 1996 to the present. I have served as contributor (author) or editor to the following publications: *Outdoor Life (Bowhunting Editor)*; *Outdoorlife.com*; *Archery Business*; *Petersen's Hunting*; *All-At-Sea*; *Bowhunting World*; *Deer & Hunting*; *Kayak Fish*; *Saltwater Sportsmen (Gulf Editor)*; *saltwatersportmen.com (Short Strikes blogger)*; *BASSMASTER*; *Fishing Tackle Retailer (FTR)*; *Fish Insider (Senior Field Editor)*; *Game & Fish (Regional Editor)*; *Gameaandfishmag.com*; *Guns and Gear*; *Deer & Deer Hunting*; and *Bow and Arrow Hunting*. I have also attended every Archery Manufacturer's Organization (AMO) and Archery Trade Association (ATA) annual trade show since 1998 until 2021 as a media representative. As an aspect of my work as an editor and journalist, I monitored the archery industry and kept abreast of new archery products, including broadheads.

14. I am the author of a book entitled "Shooter's Bible; Guide to Bowhunting," published by Skyhorse Publishing in 2013. As an aspect of my work on "Shooter's Bible; Guide to Bowhunting," I performed extensive research on prior art broadheads. As a result, I am very familiar with broadheads that have been made, used, and/or sold from early 1900s to the present. My book included a chapter, "VIII: Broadheads: The Business End of the Arrow," which discusses the history of modern broadheads and their evolution.

15. I have also designed and developed commercially available climbing treestands, lock-on style treestands, stick ladders, ladder-style treestands and fall

protection systems for use in bowhunting. I have provided consulting services to *Treestand Manufacturer's Association* (TMA) members and non-members. I have consulted on issues relating to treestand design, fall protection system design, treestand/full-body fall arrest system assembly and use instructions manuals (and sheets) and warning labels. I have authored and published over 300 treestand product use and safety instruction manuals.

16. I have nearly twenty years of experience as a federal contractor working on the National Aeronautics and Space Administration's (NASA) manned Space Transportation System (STS) Space Shuttle program, International Space Station (ISS) program and the manned/unmanned rocket/propulsion testing program developing, instituting, administering, managing and auditing wide-ranging industrial hygiene and occupational safety and health programs at the John F. Kennedy Space Center (KSC) (Kennedy Space Center, FL), the Stennis Space Center (SSC) (Stennis, MS) and the Michoud Assembly Facility (MAF) in Michoud, LA.

17. My detailed employment background, professional experience, and list of technical papers and books are contained in my CV, attached as Appendix A. I have not provided testimony as an expert witness at trial or deposition in the past four years.

18. Prior to reviewing the ‘177 patent, I was well familiar with the type of subject matter described and claimed in the ‘177 patent. The ‘177 patent relates to a broadhead for an arrow. Ex. 1001, Abstract. I am an expert in the field of broadheads.

III. MATERIALS REVIEWED AND CONSIDERED

19. In connection with my work on this matter, I have reviewed the following documents:

Exhibit	Description
1001	U.S. Patent No. 8,043,177
1002	U.S. Patent No. 3,168,313 (“Lint”)
1003	U.S. Patent No. 8,016,704 (“Vandewater”)
1004	U.S. Provisional Application No. 61/038,286
1005	U.S. Patent No. 2,806,317 (“Minisini”)
1006	U.S. Patent No. 2,212,345 (“Krieger”)
1007	U.S. Patent No. 6,918,848 (“Kuhn ‘848”)
1008	U.S. Patent No. 7,771,297 (“Kuhn ‘297”)
1009	Prosecution File History for U.S. Patent No. 8,043,177
1010	U.S. Patent No. 4,210,330 (“Kosbab”)
1011	U.S. Patent No. 6,270,435 (“Sodaro”)
1012	U.S. Patent No. 6,287,224 (“Liechty, II”)
1013	U.S. Patent No 3,600,835 (“Hendricks”)
1014	Ancient Arrowheads, depicted at https://www.wweek.com/news/schools/2022/12/29/oregon-state-university-archeologists-found-north-americas-oldest-stone-points-in-idaho/
1015	U.S. Patent No. 3,036,395 (“Nelson”)
1016	U.S. Patent No. 4,166,619 (“Bergmann et al.”)
1017	U.S. Patent No. 3,036,396 (“Swails”)
1018	U.S. Patent No. 6,830,523 (“Kuhn ‘523”)
1020	U.S. Patent No. 4,932,671 (“Anderson, Jr.”)
1021	Side-by-side comparison of figures in ‘177 patent to the prior art

IV. LEVEL OF ORDINARY SKILL IN THE ART

20. For purposes of assessing whether prior art references disclose every element of a patent claim (thus “anticipating” the claim) and/or would have rendered the claimed invention obvious, I understand that the ‘177 patent and the prior art references must be assessed from the perspective of a PHOSITA to which the patent is related, based on the understanding of that person at the time of the invention date. I understand that a PHOSITA is presumed to be aware of all pertinent prior art and the conventional wisdom in the art, and is a person having ordinary creativity. I have applied this standard throughout my declaration.

21. I have been asked to provide my opinion as to the state of the art in the field of broadheads in the 2008 timeframe. I use the 2008 timeframe because the ‘177 patent was filed in July of 2008. Whenever I offer an opinion about the knowledge of a PHOSITA, the manner in which a PHOSITA would have understood the claims of the ‘177 patent, the manner in which a PHOSITA would have understood the prior art, or what a PHOSITA would have been led to do based on the prior art, I am referencing this timeframe (*i.e.*, 2008). When I offer an opinion or explanation below about the teachings of the prior art and/or the claims of the ‘177 patent, I am explaining how the issue would have been viewed by a PHOSITA in the 2008 timeframe, even if I do not say so specifically in each case.

22. In my opinion, a person of ordinary skill in the art related to the ‘177 patent in the 2008 timeframe would have either: (1) a bachelor’s degree in the field of mechanical engineering, and/or related field and at least two years of work experience in the development of broadheads; or (2) any education and experience equivalent to (1).

23. By 2008, I had several years of experience in research, development, design, and testing of broadheads, and was a named inventor on several patents/patent applications related to broadheads. Therefore, I was a person of more than ordinary skill in the art during the relevant time period. When developing the opinions set forth below, I assumed the perspective of a PHOSITA, as set forth above and have worked with many people who fit the characteristics of a PHOSITA. When developing the opinions set forth below, I assumed the perspective of a PHOSITA, as set forth above.

V. RELEVANT LEGAL STANDARDS

24. Certain legal standards have been explained to me by counsel for Bowmar Archery LLC. I have applied them to my detailed opinions explained below, and I state these legal standards as follows.

A. Claim Construction

25. I have been informed that the scope of a patent claim is to be determined by the words of the claim itself, read in view of the relevant intrinsic record—*i.e.*,

the specification and file history. I have further been informed that the claims are to be interpreted in terms of their meaning to a PHOSITA at the time of the invention, which I understand means on the effective filing date of the patent application. That is, if a particular claim term has a recognized meaning within the field, that meaning may apply; however, if a patent claim term has no recognized meaning, such as a “coined” term used solely for the purposes of the patent, then the description within the intrinsic record governs the meaning of such a term.

26. I have also been informed that extrinsic sources of information may be used to inform the understanding of a PHOSITA at the time of patenting, but that such extrinsic information cannot overcome a meaning for a term in a manner that is inconsistent with that given by the intrinsic record consisting of the claims, specification, and file history.

27. In addition to informing the interpretation of claim terms, I understand the intrinsic record may show a specialized definition for a term or compel a specific interpretation of a term that departs from its standard meaning within the art, such as when a patent term is expressly defined in the specification or when the patentee has made a clear and unambiguous disclaimer regarding the meaning of the term within the specification or during prosecution of the patent application.

28. I also understand that care must be taken in consulting the specification and prosecution history as the interpretative process should not import limitations

from the specification into the defining language of the claims. It is also my understanding that, absent clear evidence to the contrary, claims should not be limited to specific embodiments of the invention set forth in the specification. It is my understanding that even when the specification describes only a single embodiment, the claims of the patent will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using words or expressions of manifest exclusion or restriction.

B. Anticipation

29. I have been informed that a patent claim is “anticipated” when a single patent or printed publication describes all of the elements of a claim, either expressly or by inherent disclosure. I further understand that an element of a patent claim is inherently disclosed in a prior art document if it necessarily exists in that disclosure.

C. Obviousness

30. I have been informed that a claim may be obvious if a person of ordinary skill in the art would have been motivated to combine elements of the prior art or knowledge within the prior art to achieve the claimed invention and would have had a reasonable expectation of success in doing so. I also understand that the reason to select and combine features, the predictability of the results in doing so, and a reasonable expectation of success of doing so may

be found in the teachings of the prior art themselves, in the nature of any need or problem in the field that was addressed by the patent, in the knowledge of persons of ordinary skill in the art at the time, as well as in common sense or the level of creativity exhibited by a person of ordinary skill in the art. There need not be an express or explicit suggestion to combine references.

31. I understand that as part of my analysis of whether a given patent claim is obvious, I should consider: (1) the scope and content of the prior art; (2) the differences between the prior art and the claims; (3) the level of ordinary skill in the pertinent art; and (4) any secondary considerations that may indicate that the claim is not obvious. I understand that the smaller the differences between what is claimed and the prior art, the more likely that what is claimed is obvious.

32. I have also been informed that a patent claim may be considered obvious if, at the time of the invention, combining known elements according to known methods would have yielded no more than predictable results. I have also been informed by counsel that a patent claim may be considered obvious if there existed at the time of invention a known problem for which there was an obvious solution.

VI. SUMMARY OF THE '177 PATENT

33. The '177 patent is entitled "Arrowhead Having Collapsible and Outwardly Biased Blades." The '177 patent describes an arrowhead, generally referred to as a broadhead, with a cylindrical body or ferrule 12. Ex. 1001, 2:52-55. The rearward end of the ferrule 12 attaches to an arrow and the forward end of the ferrule 12 has a pointed tip 14. Ex. 1001, 2:55-58. The arrowhead 10 includes blade members 20 pivotably connected to the ferrule 12 for movement of the blades between a retracted position and an extended position. Ex. 1001, 2:59-62. At least one biasing member 40, such as a spring, biases the blade members toward the extended position. Ex. 1001, 3:35-44.

34. Figures 1 and 2 in the '177 show the blades biased by two springs. Figures 5 and 6 in the '177 show the blades biased by a single spring. I include annotated versions of Figures 1, 2, 5, and 6 as reference:

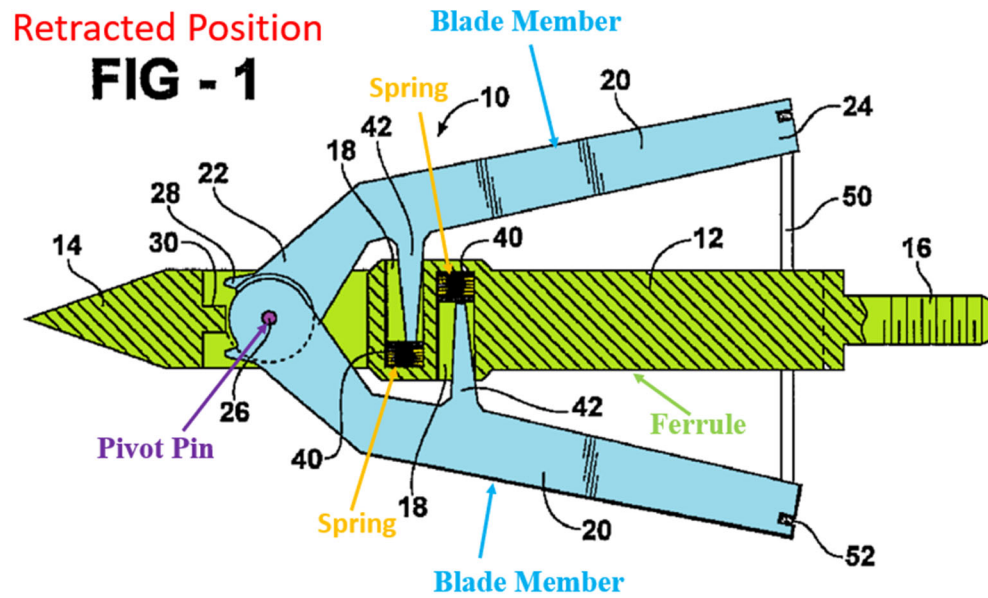


Figure 1 - Showing Embodiment with Blades in Retracted Position

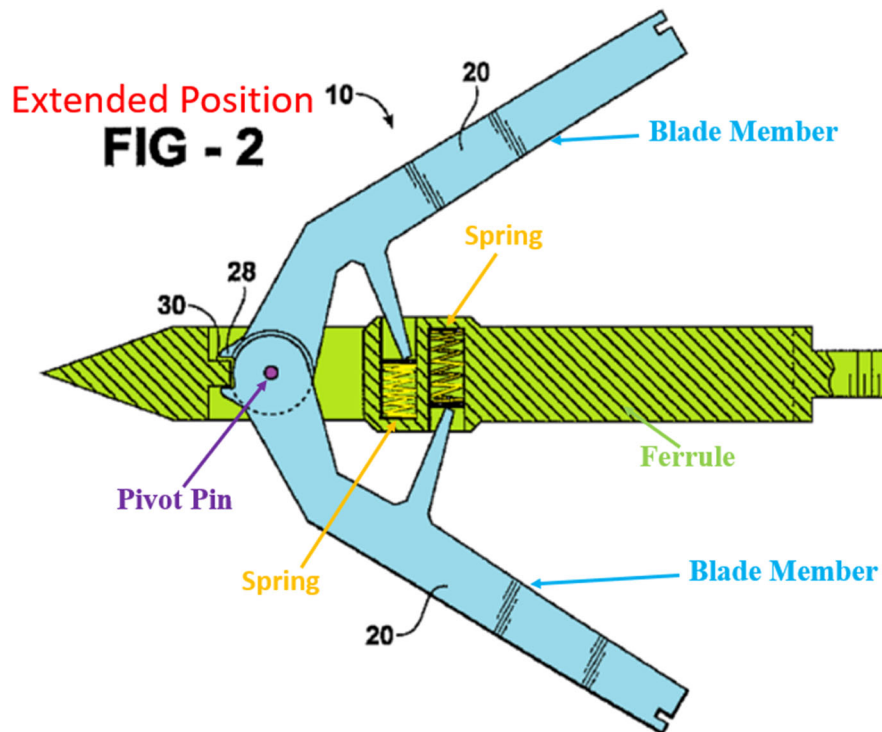


Figure 2 – Showing Embodiment with Blades in Extended Position

Retracted Position

FIG - 5

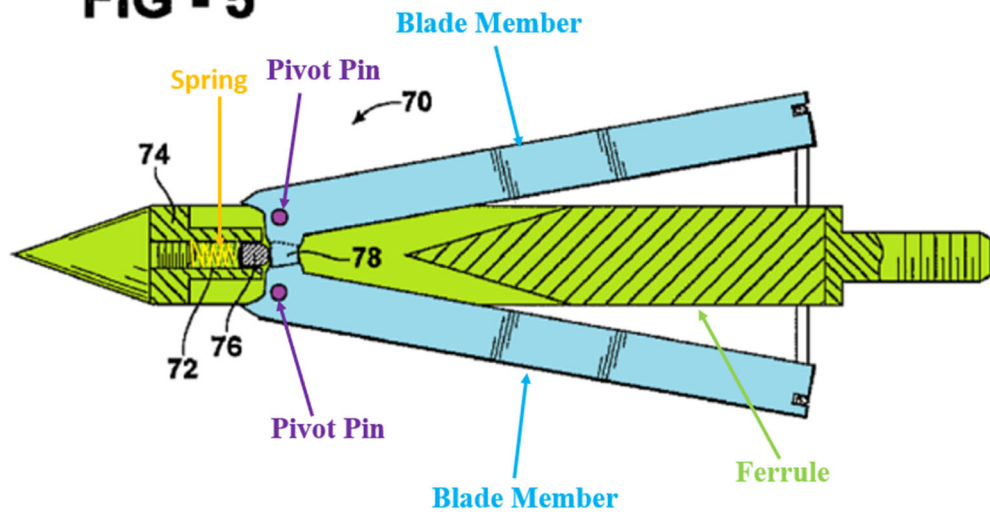


Figure 5 - Showing Embodiment with Blades in Retracted Position

Extended Position

FIG - 6

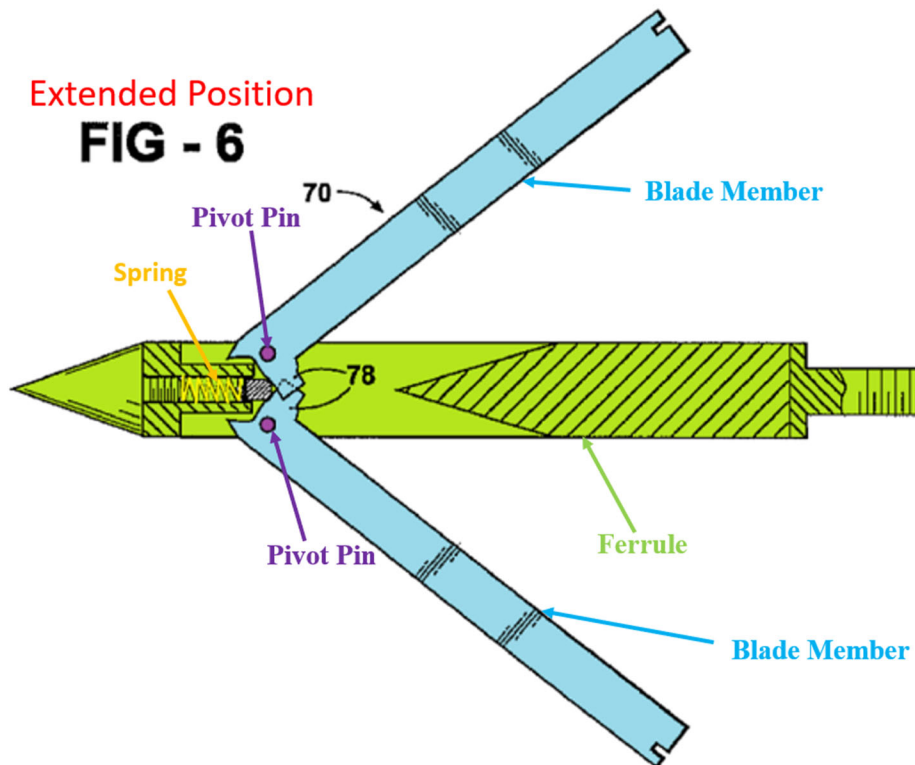


Figure 6 – Showing Embodiment with Blades in Extended Position

VII. SCOPE AND CONTENT OF THE PRIOR ART

35. I have researched, studied, designed, made, and used broadheads extensively. The prior art is replete with examples of various mechanical broadheads having a pair of blade members pivotally interconnected with the broadhead, and a biasing member, or spring, that biases the blade members either toward an extended position and/or a retracted position. As will be discussed below, the prior art addressed below provide examples of various broadheads describing the components and functionality of the broadheads claimed in the '177 patent. The prior art addressed below are in the same field of endeavor, as they are all related to arrowheads, or weapon heads.

36. Based on the Background of the Invention and the Summary of the Invention in the '177 patent, it appears that Applicant believed himself to be the first to invent a broadhead having a pair of blade members pivotally interconnected with the broadhead, and a biasing member, or spring, that biases the blade members toward an extended position. However, as the prior art demonstrates, such broadheads were already known.¹

¹ For example, Exhibit 1021 contains a side-by-side comparison of figures showing embodiments in the '177 patent to figures in certain prior art discussed below. The side-by-side comparison demonstrates that the subject matter of the '177 patent was well known before its filing date.

A. U.S. Patent No. 3,168,313 (“Lint”)

37. According to the face of the document, Lint (Ex. 1002) was published February 2, 1965. I have been informed by counsel that Lint meets the requirements to be considered prior art to the ‘177 patent. I have reviewed the prosecution history file for the ‘177 patent, it does not appear that Lint was considered by the Examiner during prosecution of the ‘177 patent.

38. Lint is titled “Hunting Arrowhead with Retractable Barbs.” Lint discloses “arrowhead structures generally and more particularly to an improved arrowhead which may be interchangeably employed for both target and hunting arrows.” Ex. 1002, 1:8-10.

39. Lint discloses an arrowhead 10 with a tubular body, or ferrule 12. Ex. 1002, 2:29-37. The rearward end of the ferrule 12 attaches to an arrow and the forward end of the ferrule 12 has a tip 11. Ex. 1002, 2:29-38. The arrowhead 10 includes blade members, or barbs 19, pivotably connected to the ferrule 12 for movement between a retracted position and an extended position. Ex. 1002, 2:42-47. A spring 24 biases the blade members, or barbs 19, toward the extended position. Ex. 1002, 2:53-58. I include an annotated version of Figure 2 in Lint for reference:

impacting bone with one of the blades by allowing the blade to pivot upon impact with the bone structure and thus allowing the broadhead to continue penetration to one side of the bone structure. A PHOSITA would understand that such a configuration provides flexibility in transiting bone structures in a game animal in a manner that significantly minimizes the amount of kinetic energy lost to penetration that reduces lateral drag on the arrow shaft.

B. U.S. Patent No. 8,016,704 (“Vandewater”)

41. According to the face of the document, Vandewater (Ex. 1003) issued September 13, 2011, and claims priority to Provisional Application No. 61/038,286 (Ex. 1004), filed on March 20, 2008. I have been informed by counsel that Vandewater meets the requirements to be considered prior art to the ‘177 patent. I have reviewed the prosecution history file for the ‘177 patent, and it does not appear that Vandewater was considered by the Examiner during prosecution of the ‘177 patent.

42. Vandewater is titled “Arrowhead With Pivoting Blade.” Vandewater discloses “arrowheads used in conjunction with archery hunting.” Ex. 1003, 1:14-15. Vandewater discloses several embodiments of the arrowheads. In one embodiment, Vandewater discloses an arrowhead 210 with a tubular body or ferrule 214. Ex. 1003, 3:13-16 and 6:48-50. The rearward end of the ferrule 214 attaches to an arrow and the forward end of the ferrule 214 has a tip 226. Ex. 1003,

6:54. The arrowhead 210 includes a first blade 212 and a second blade 213 pivotably connected to the ferrule 214 for movement between a retracted position and an extended position. Ex. 1003, 6:45-48; Figs. 7-9 and 15-18. Vandewater describes a retaining mechanism, such as a biasing element, that retains the blades 212, 213 in a deployed position. Ex. 1003, 7:55-58 and 7:64-8:2. Vandewater discloses the biasing element may be “a conventional spring-steel compression spring, or an elastomeric material such as rubber or the like.” Ex. 1003, 3:63-66. Vandewater discloses that the retaining mechanism is biased or urged against a rear portion of the blades to resist pivotal movement unless and until the force acting against the cutting edges of the blades is sufficient to overcome a biasing force of the retaining mechanism and cause the blades to pivot. Ex. 1003, 3:2-7.

43. Vandewater discloses an advantage of such a blade configuration is that “the arrowhead may penetrate an animal and may continue penetration after impacting a bone with the blade by allowing the blade to pivot upon impact with the bone structure and thus allowing the arrowhead to continue penetration to one side of the bone structure.” Ex. 1003, 2:66-3:4. Vandewater further discloses that the advantage of such a pivoting blade configuration is that it “allows for a large wound cavity with deeper penetration because the blade will pivot upon contact with bone or harder tissue. This allows an arrow equipped with the arrowhead disclosed herein to pass through the animal with less resistance and without being jolted off its

intended course. This provides enhanced penetration for increased bleeding of the animal, and therefore results in an efficient kill.” Ex. 1003, 8:24-30. Vandewater also discloses that “[w]ith two pivotable blades, the flight characteristics can be improved still further, providing for a more aerodynamic arrowhead with the same or nearly the same potential for a large wound cavity associated with the single-blade embodiments.” Ex. 1003, 8:34-38.

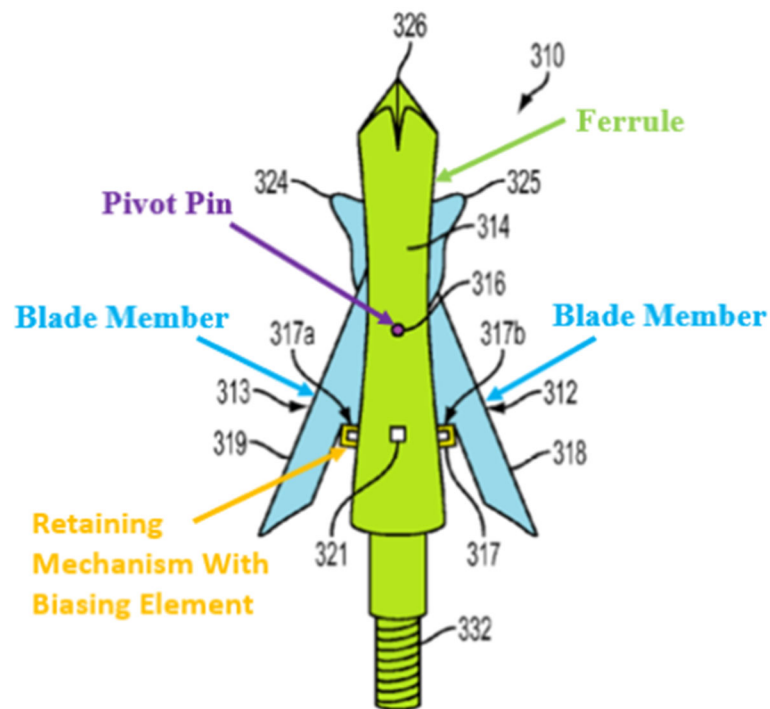
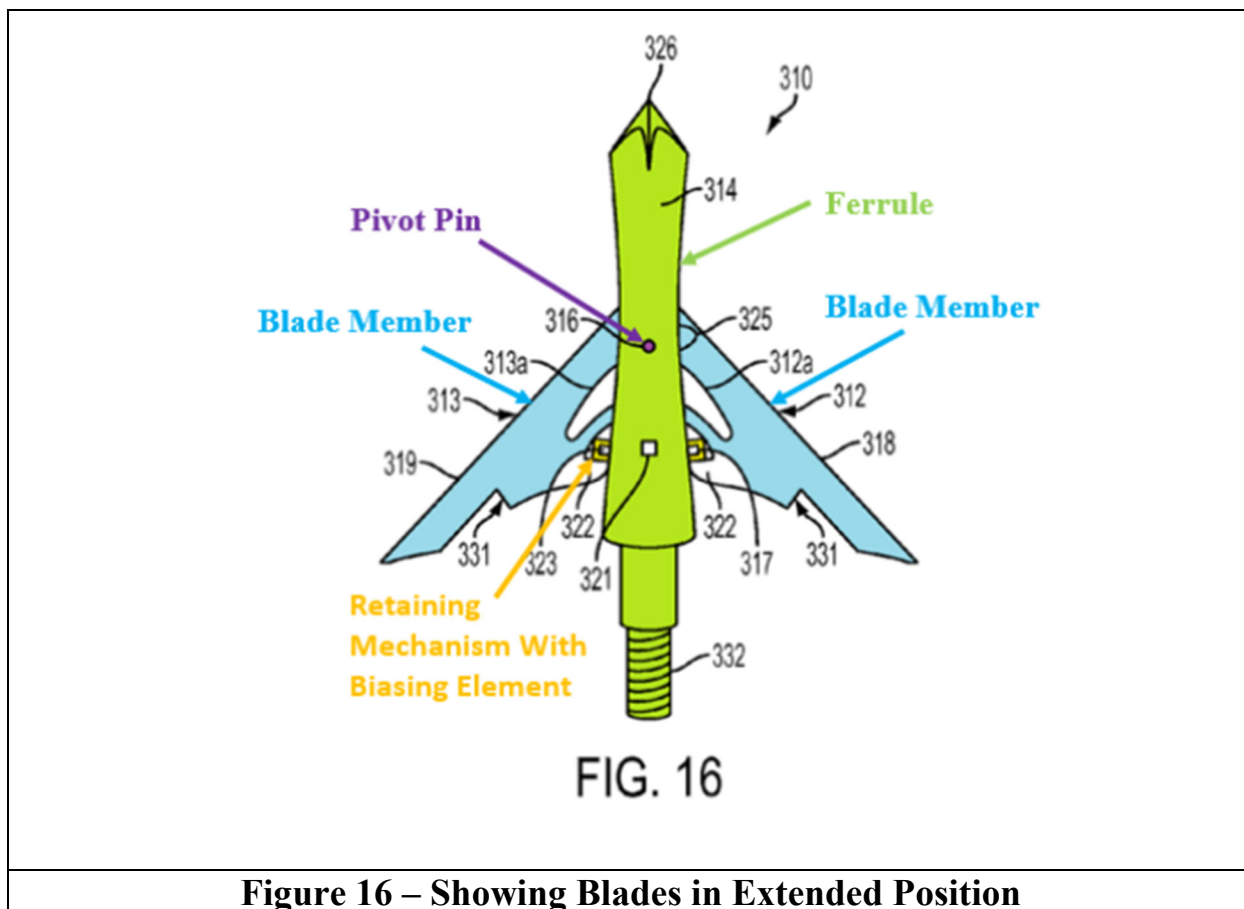


Figure 16 – Showing Blades in Retracted Position



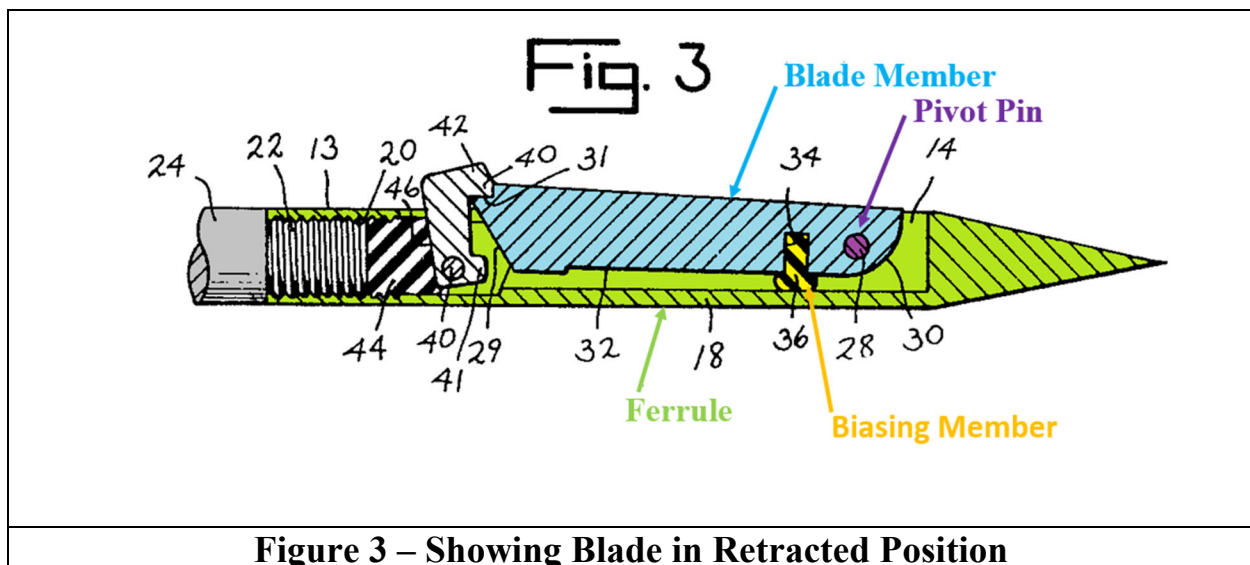
C. U.S. Patent No. 3,600,835 (“Hendricks”)

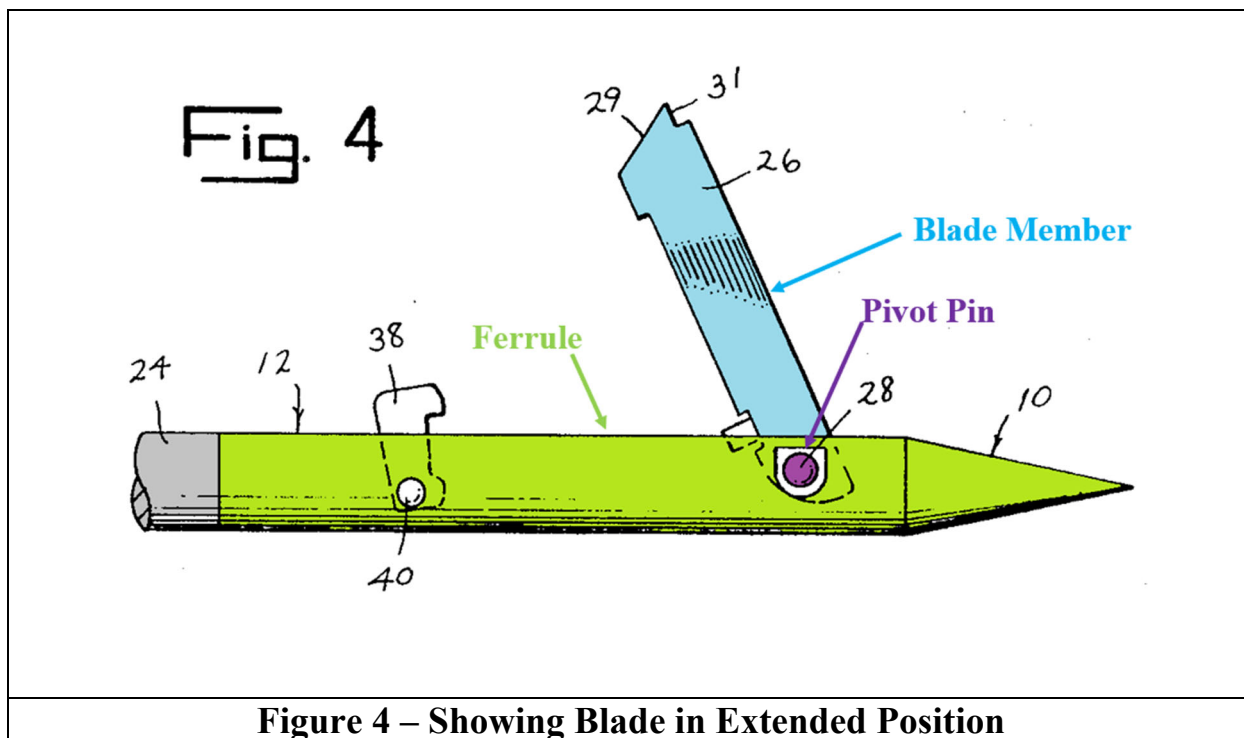
45. According to the face of the document, Hendricks (Ex. 1013) was published August 24, 1971. I have been informed by counsel that Hendricks meets the requirements to be considered prior art to the ‘177 patent. I have reviewed the prosecution history file for the ‘177 patent, it does not appear that Hendricks was considered by the Examiner during prosecution of the ‘177 patent.

46. Hendricks is titled “Spear Head With Swingable Barb.” Hendricks discloses a “head for a spear or like weapon having a tip section and a body section. An elongated barb is pivotally connected to the forward end of the body section and

is received therein, and is resiliently urged outwardly therefrom.” Ex. 1013, Abstract.

47. Hendricks discloses a weapon head 10 with a tubular body, or ferrule 12. Ex. 1013, 1:72-75. The rearward end of the ferrule 12 attaches to a weapon shaft and the forward end of the ferrule 12 has a tip 10. Ex. 1013, 1:72-75, 2:2-5. The weapon head includes a blade member, or barb 26, pivotally connected to the ferrule 12 for movement between a retracted position and an extended position. Ex. 1013, 2:7-9. A resilient member 36 biases the blade member, or barb 19, toward the extended position. Ex. 1013, 2:28-32, 3:5-6 (“Barb 26 is then forced outwardly from its closed position by resilient member.”). I include annotated versions of Figures 3 and 4 in Hendricks for reference:





D. U.S. Patent No. 2,806,317 (“Minisini”)

48. According to the face of the document, Minisini (Ex. 1005) was published September 17, 1957. I have been informed by counsel that Minisini meets the requirements to be considered prior art to the ‘177 patent. I have reviewed the prosecution history file for the ‘177 patent, and it does not appear that Minisini was considered by the Examiner during prosecution of the ‘177 patent.

49. Minisini is titled “Arrowhead.” Minisini is directed toward “arrows and more particularly to an arrow especially designed for shooting fish, but which is adaptable for other uses.” Ex. 1005, 1:15-17. Minisini discloses an arrowhead H with a ferrule 12. Ex. 1005, 2:10-12. The rearward end of the ferrule 12 attaches to an

arrow shaft and the forward end of the ferrule 12 has a penetrating point or tip 18. Ex. 1005, 2:10-12, 20-23. The arrowhead H include a blade member, or barb 20, pivotably connected to the ferrule 12 for movement between a retracted position and an extended position. Ex. 1005, 2:27-31. Minisini discloses: “The barb preferably has its outer longitudinal edge sharpened to cut through a fish” Ex. 1005, 2:31-34

E. U.S. Patent No. 2,212,345 (“Krieger”)

50. According to the face of the document, Krieger (Ex. 1006) issued on September 12, 1938. I have been informed by counsel that Krieger meets the requirements to be considered prior art to the ‘177 patent. I have reviewed the prosecution history file for the ‘177 patent, and it does not appear that Krieger was considered by the Examiner during prosecution of the ‘177 patent.

51. Krieger is titled “Arrowhead.” Krieger is directed toward “arrows and more particularly to arrowheads.” Ex. 1006, 1:1-2. Krieger discloses that the arrowhead 11 with a rearward end that attach to an arrow shaft 10. Ex. 1006, 1:32-43. The arrowhead contains blade members 16 having rear or trailing edges, wherein the blades taper from their trailing edges to a penetrating point 18. Ex. 1006, 1:44-50. Krieger discloses: “To reduce air friction the longitudinal edges of the wings or blades are sharpened to knife edges.” Ex. 1006, 2:10-12.

F. Additional Prior Art Confirming the General Knowledge of a PHOSITA

52. The prior art discloses myriad examples of broadheads having blade members pivotally interconnected with the broadhead, and a biasing member, such as a spring, that biases the blade members toward an extended position. Some such broadheads are discussed briefly below.

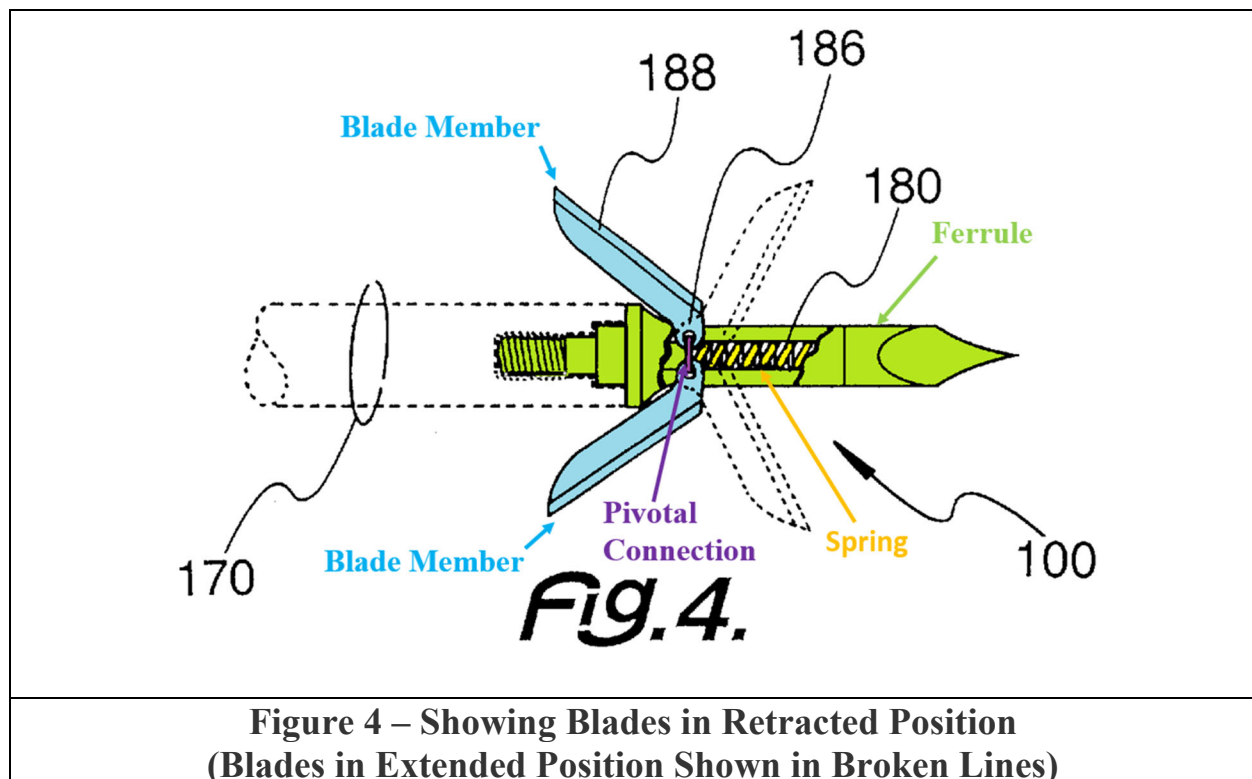
1. U.S. Patent No. 6,270,435 (“Sodaro”)

53. According to the face of the document, Sodaro (Ex. 1011) was published August 7, 2001. I have been informed by counsel Sodaro meets the requirements to be considered prior art to the ‘177 patent. I have reviewed the prosecution history file for the ‘177 patent, and while Sodaro appears on the face of the ‘177 patent, it does not appear that Sodaro was substantively addressed by the Examiner during prosecution of the ‘177 patent.

54. Sodaro is titled “Arrowhead.” Sodaro discloses “An arrowhead has spring loaded blades restrained thereon, which blades release and penetrate a target as the target is struck by the arrow. This arrowhead provides the striking power of an arrowhead known as a broadhead, while having streamlined flight characteristics.” Ex. 1011, Abstract.

55. Sodaro discloses an arrowhead 100 with a tubular body, or ferrule 160. Ex. 1011, 2:32-40. The rearward end of the ferrule 160 attaches to an arrow and the forward end of the ferrule 160 has a tip 152. Ex. 1011, 2:32-40.

The arrowhead 100 includes blade members 188 pivotally connected to the ferrule 160 for movement between a retracted position and an extended position. Ex. 1011, 2:42-47. A spring 150 biases the blade members toward the extended position. Ex. 1011, 2:53-58, 4:41-42, 4:59-60. I include an annotated version of Figure 4 in Sodaro for reference:



2. U.S. Patent No. 6,287,224 (“Liechty, II”)

56. According to the face of the document, Liechty, II (Ex. 1012) was published September 11, 2001. I have been informed by counsel that Liechty, II meets the requirements to be considered prior art to the ‘177 patent. I have reviewed the prosecution history file for the ‘177 patent, and while Liechty, II is on the face

of the '177 patent, it does not appear that Liechty, II was substantively addressed by the Examiner during prosecution of the '177 patent.

57. Liechty, II is titled “Non-Consumable Blade Retention For Blade-Opening Arrowheads.” Liechty, II discloses “A blade-opening arrowhead with a plurality of removable blades, each pivotally connected at one opposing blade end to an arrowhead body by a hinge pin.” Ex. 1012, Abstract. Liechty, II discloses an arrowhead 20 with a tubular body, or ferrule 30. Ex. 1012, 10:64-67, Fig. 5. The rearward end of the ferrule 30 attaches to an arrow and the forward end of the ferrule 30 has a tip. Ex. 1012, 10:27; Fig. 5. The arrowhead 20 includes blade members pivotally connected to the ferrule 30 for movement between a retracted position and an extended position. Ex. 1012, 10:30-40. As shown in Figure 5 in Liechty, II, “annular spring 80 drives or continually urges cutting edge 54 of each blade 50 in a forward direction, further slicing uncut or unpenetrated tissue.” Ex. 1012, 12:16-18. I include an annotated version of Figure 5 in Liechty, II below for reference. I also include a modified, annotated version of Figure 5 below illustrating how the annular spring 80 further urges the blades in a forward direction, and thus, increasing the space between ends of the blades and the ferrule body.

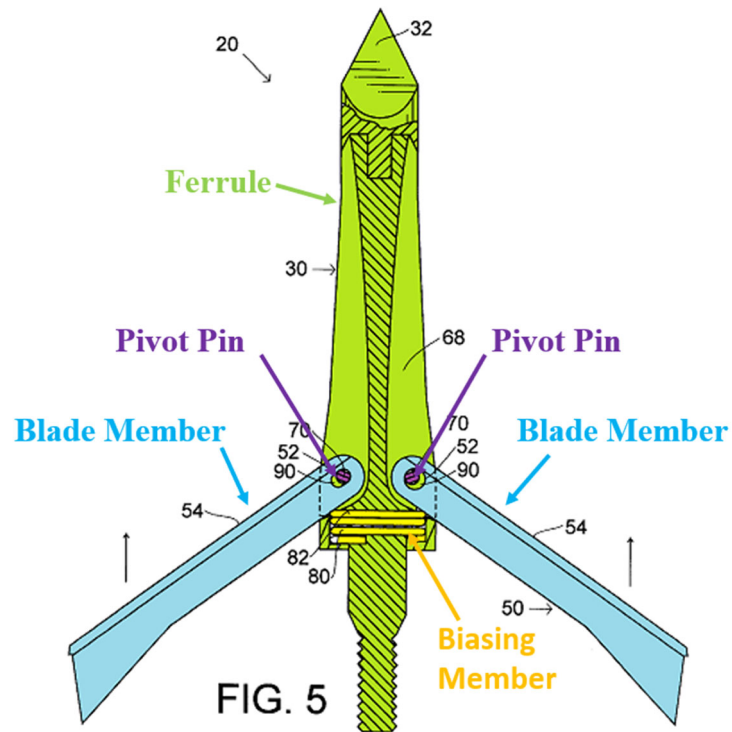
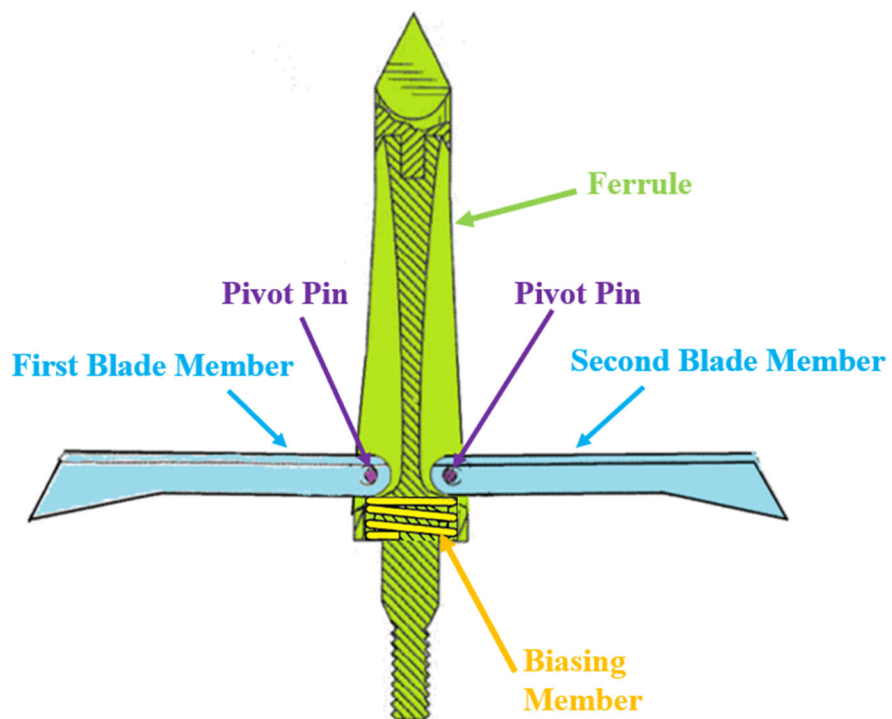


Figure 5 – Showing Spring Biasing Blades Forward



Modified Version of Figure 5 – Showing Spring Biasing Blades Further Forward

VIII. CLAIM INTERPRETATION

58. The ‘177 patent contains 17 claims, of which 1-4, 7, 9, 11, 12, 15, and 17 are addressed in this declaration. I understand that each claim must be evaluated individually on its merits, and I have done so below in Section IX.

59. I understand that in an *inter partes* review proceeding, claim terms shall be given its ordinary and customary meaning to a PHOSITA, consistent with the prosecution history. In my analysis below, I apply that standard to the words and phrases of the challenged claims.

60. The interpretations of certain terms in the claims are addressed below before discussing the claims relative to the prior art.

61. The claims recite a “ferrule.” The specification states: “The arrowhead 10 includes a generally cylindrical body or ferrule 12.” (Ex. 1001, 2:53-55). In my opinion, the specification of the ‘177 patent defines “ferrule” as a “cylindrical body.” In my opinion, this definition is consistent with the ordinary and customary meaning to a PHOSITA.

IX. THE PRIOR ART RENDER CLAIMS 1-4, 7, 9, 11, 12, 15, AND 17 OF THE ‘177 PATENT INVALID

62. I have been asked to provide my opinion concerning whether claims 1-4, 7, 9, 11, 12, 15, and 17 of the ‘177 patent are valid based on the prior art references identified in Petitioners’ petition.

63. After reviewing the prior art and claims 1-4, 7, 9, 11, 12, 15, and 17 of the '177 patent, it is my opinion that a PHOSITA would understand the prior art to render each such claim invalid. The basis for my opinion and the details of my analysis are provided below.

A. Ground I: Lint Discloses Every Limitation of Claims 1-4, 7, 9, 11, 12, 15, and 17

64. I have compared claims 1-4, 7, 9, 11, 12, 15, and 17 to Lint. It is my opinion that the Lint discloses each and every limitation of claims 1-4, 7, 9, 11, 12, 15, and 17. Below, I address each claim limitation.

Claim 1 of '177 Patent	Lint
A broadhead for an arrow having a shaft, the broadhead comprising:	Lint discloses an “ arrowhead ” that “ includes a forward or pointed tip portion 11 and a body portion 12 . . . The body 12 is of a generally tubular shape and is provided with a bore 14 which is internally threaded as indicated at 15. The threads 15 of the bore 14 engage with threads 16 provided upon one end of an arrow shaft 17. ” Ex. 1002, 2:29-38.
a ferrule having a rearward end configured for attachment to the shaft and an opposite forward end with a ferrule body extending therebetween;	Lint discloses that “ the arrowhead of the present invention indicated generally at 10 includes a forward or pointed tip portion 11 and a body portion 12. The tip portion 11 may be removably attached to the body portion 12, as indicated at 13 in FIGURES 2 and 3, or the tip may be integrally secured to the body 12. The body 12 is of a generally tubular shape and is

Claim 1 of '177 Patent	Lint
	provided with a bore 14 which is internally threaded as indicated at 15. The threads 15 of the bore 14 engage with threads 16 provided upon one end of an arrow shaft 17." Ex. 1002, 2:29-38 and Fig. 1. I include an annotated version of Figure 2 in Paragraph 66 below.
a first blade member having a first end pivotally interconnected with the ferrule body and an opposite second end,	Lint discloses: "The tubular body 12 of the arrowhead 10 is provided with two longitudinally extending slots or depressions 18 which are oppositely disposed at either side of the body 12. A barb 19 is contained in each of the slots 18 and is pivoted to the tubular body 12 by means of a pivot pin 20." Ex. 1002, 2:39-45 and Fig. 2. I include an annotated version of Figure 2 in Paragraph 67 below.
the first blade member having a retracted position wherein the second end is spaced from the ferrule body at a first distance and an extended position wherein the second end is spaced from the ferrule body by a distance which is greater than the first distance;	Lint discloses: "Each of said barbs 19 includes an outer barb portion 21 which projects outwardly and rearwardly of the arrowhead body 12 when the barbs 19 are in the open position as illustrated by FIGURE 2." Ex. 1002, 2:45-48 and Fig. 2. Lint discloses "when the arrowhead 10 penetrates the flesh of an animal, the initial impact on the outer portions 21 of the barbs 19 causes the barbs to be retracted into the slots 18 against the bias of the spring 24." Ex. 1002, 2:64-67.

Claim 1 of '177 Patent	Lint
	Figures 2 and 3 of Lint shows that the space between the first blade member and the ferrule body is greater when the first blade member is in an extended position. Ex. 1002, Figs. 2 and 3. I include annotated versions of Figures 2 and 3 in Paragraph 68 below.
a second blade member having a first end pivotally interconnected with the ferrule body and an opposite second end	Lint discloses: “The tubular body 12 of the arrowhead 10 is provided with two longitudinally extending slots or depressions 18 which are oppositely disposed at either side of the body 12. A barb 19 is contained in each of the slots 18 and is pivoted to the tubular body 12 by means of a pivot pin 20.” Ex. 1002, 2:39-45 and Fig. 2. I include an annotated version of Figure 2 in Paragraph 69 below.
the [second] blade member having a retracted position wherein the second end is spaced from the ferrule body at a first distance and an extended position wherein the second end is spaced from the ferrule body by a distance which is greater than the first distance; and	Lint discloses: “Each of said barbs 19 includes an outer barb portion 21 which projects outwardly and rearwardly of the arrowhead body 12 when the barbs 19 are in the open position as illustrated by FIGURE 2.” Ex. 1002, 2:45-48 and Fig. 2. Lint discloses “when the arrowhead 10 penetrates the flesh of an animal, the initial impact on the outer portions 21 of the barbs 19 causes the barbs to be retracted into the slots 18 against the bias of the spring 24.” (Ex. 1002, 2:64-67.

Claim 1 of '177 Patent	Lint
	Figures 2 and 3 of Lint shows that the space between the second blade member and the ferrule body is greater when the second blade member is in an extended position. Ex. 1002, Figs. 2 and 3. I include annotated versions of Figures 2 and 3 in Paragraph 70 below.
at least one biasing member biasing the first and second blade members towards the extended positions, the biasing member being the only element operable to hold the blade members in the extended position.	Lint discloses: “A spring 24 is provided within the bore 14 of the body 12 and extends between the tip portion 11 of the arrowhead 10 and the forward surface of the transversely extending inner barb portions 22. This spring operates to bias the barbs 19 in the open position illustrated by FIGURE 2.” Ex. 1002, 2:53-58 and Fig. 2. As shown in Figure 2 in Lint, the spring is the only element operable to hold the blade members in the extended position. I include an annotated version of Figure 2 in Paragraph 71 below.

Claim 2 of the '177 Patent	Lint
A broadhead in accordance with claim 1, wherein: the pivotal interconnection between the first blade member and the ferrule body is at a fixed position relative to the ferrule body; and the pivotal interconnection between the second blade member and the ferrule body being at a fixed position relative to the ferrule body.	As shown in Figure 2 of Lint, the pivotal interconnections between the first blade member and the ferrule body and between the second blade member and the ferrule body are fixed position relative to the ferrule body. Ex. 1002, Fig. 2. I include an annotated version of Figure 2 in Paragraph 72 below.

Claim 3 of '177 Patent	Lint
A broadhead in accordance with claim 2, wherein: the pivotal interconnection between the first blade member and the ferrule body and the pivotal interconnection between the second blade member and the ferrule body are substantially equidistant from the forward end of the ferrule.	As shown in Figure 2 of Lint, the pivotal interconnections between the first blade member and the ferrule body and between the second blade member and the ferrule body are substantially equidistant from the forward end of the ferrule. Ex. 1002, Fig. 2. I include an annotated version of Figure 2 in Paragraph 73 below.

Claim 4 of '177 Patent	Lint
A broadhead in accordance with claim 1, wherein: the first ends of the first and second blade members are forward ends and the second ends are rearward ends.	Lint discloses: “ A barb 19 is contained in each of the slots 18 and is pivoted to the tubular body 12 by means of a pivot pin 20. Each of said barbs 19 includes an outer barb portion 21 which projects outwardly and rearwardly of the arrowhead body 12 when the barbs 19 are in the open position as illustrated by FIGURE 2. Outer barb portions 21 extend angularly from the inner barb ends 22 which project through the forward portions 23 of the slots 18 into the bore 14 of the tubular body 12.” Ex. 1002, 2:42-50. I include an annotated version of Figure 2 in Paragraph 75 below.

Claim 7 of '177 Patent	Lint
A broadhead in accordance with claim 1, further comprising: a retaining element engaging the blade members	Lint discloses: “To remove the arrowhead from the animal, the barbs may be again retracted by threading the shaft 17 into the bore 14 until the

Claim 7 of '177 Patent	Lint
to maintain the blade members in the retracted position.	shaft contacts the outer surfaces of the inner barb portions 22. When this contact occurs, further inward threading of the shaft within the bore 14 will cause the barbs 19 to be retracted within the slots 18, as illustrated by FIGURE 3. " Ex. 2:70-3:4. I include an annotated version of Figure 3 in Paragraph 75 below.

Claim 9 of '177 Patent	Lint
A broadhead in accordance with claim 1, wherein: the biasing member is a coil spring.	Lint discloses: " A spring 24 is provided within the bore 14 of the body 12 and extends between the tip portion 11 of the arrowhead 10 and the forward surface of the transversely extending inner barb portions 22. This spring operates to bias the barbs 19 in the open position illustrated by FIGURE 2. " Ex. 1002, 2:53-58 and Fig. 2.

Claim 11 of '177 Patent	Lint
A broadhead for an arrow having a shaft, the broadhead comprising:	To the extent the preamble is limiting, Lint discloses an " arrowhead " that " includes a forward or pointed tip portion 11 and a body portion 12 . . . The body 12 is of a generally tubular shape and is provided with a bore 14 which is internally threaded as indicated at 15. The threads 15 of the bore 14 engage with threads 16 provided upon one end of an arrow shaft 17. " Ex. 1002, 2:29-38.

Claim 11 of '177 Patent	Lint
a ferrule having a rearward end configured for attachment to the shaft and an opposite forward end with a ferrule body extending therebetween,	Lint discloses that “ the arrowhead of the present invention indicated generally at 10 includes a forward or pointed tip portion 11 and a body portion 12. The tip portion 11 may be removably attached to the body portion 12, as indicated at 13 in FIGURES 2 and 3, or the tip may be integrally secured to the body 12. The body 12 is of a generally tubular shape and is provided with a bore 14 which is internally threaded as indicated at 15. The threads 15 of the bore 14 engage with threads 16 provided upon one end of an arrow shaft 17. ” Ex. 1002, 2:29-38 and Fig. 1. I include an annotated version of Figure 2 of Lint in Paragraph 66 below.
the forward end of the ferrule defining the forward tip of the arrow and being fixed with respect to the ferrule body;	Lint discloses: “[T]he arrowhead of the present invention indicated generally at 10 includes a forward or pointed tip portion 11 and a body portion 12. The tip portion 11 may be removably attached to the body portion 12, as indicated at 13 in FIGURES 2 and 3, or the tip may be integrally secured to the body 12. ” Ex. 1002, 2:29-34.
a first blade member having a forward end pivotally interconnected with the ferrule body and an opposite rearward end,	Lint discloses: “ A barb 19 is contained in each of the slots 18 and is pivoted to the tubular body 12 by means of a pivot pin 20. ” Ex. 1002, 2:43-45 and Fig. 2. As shown in Figure 2 in Lint, the first blade member has a forward end pivotally interconnected with the ferrule body and an opposite rearward end. I include an annotated

Claim 11 of '177 Patent	Lint
	version of Figure 2 in Paragraph 67 below.
the first blade member having a retracted position wherein the rearward end is spaced from the ferrule body at a first distance and an extended position wherein the rearward end is spaced from the ferrule body by a distance which is greater than the first distance,	Lint discloses: “Each of said barbs 19 includes an outer barb portion 21 which projects outwardly and rearwardly of the arrowhead body 12 when the barbs 19 are in the open position as illustrated by FIGURE 2.” Ex. 1002, 2:45-48 and Fig. 2. Figures 2 and 3 of Lint show that the space between the first blade member and the ferrule body is greater when the first blade member is in an extended position. Ex. 1002, Figs. 2 and 3. I include annotated versions of Figures 2 and 3 in Paragraph 68 below.
the pivotal interconnection between the first blade member and the ferrule body being at a fixed position relative to the ferrule body;	Lint discloses: “A barb 19 is contained in each of the slots 18 and is pivoted to the tubular body 12 by means of a pivot pin 20.” Ex. 1002, 2:43-45 and Fig. 2. Figures 2 and 3 in Lint disclose that the pivotal interconnection between the first blade member and the ferrule body is at a fixed position relative to the ferrule body. I include annotated version of Figure 2 in Paragraph 72 below.
a second blade member having a forward end pivotally interconnected	Lint discloses: “A barb 19 is contained in each of the slots 18 and is pivoted to the tubular body 12 by

Claim 11 of '177 Patent	Lint
with the ferrule body and an opposite rearward end,	means of a pivot pin 20. " Ex. 1002, 2:43-45 and Fig. 2. I include an annotated version of Figure 2 in Paragraph 69 below.
the second blade member having a retracted position wherein the rearward end is spaced from the ferrule body at a first distance and an extended position wherein the rearward end is spaced from the ferrule body by a distance which is greater than the first distance,	Lint discloses: "Each of said barbs 19 includes an outer barb portion 21 which projects outwardly and rearwardly of the arrowhead body 12 when the barbs 19 are in the open position as illustrated by FIGURE 2." Ex. 1002, 2:45-48 and Fig. 2. Figures 2 and 3 of Lint show that the space between the second blade member and the ferrule body is greater when the second blade member is in an extended position. Ex. 1002, Figs. 2 and 3. I include annotated versions of Figures 2 and 3 in Paragraph 70 below.
the pivotal interconnection between the second blade member and the ferrule body being at a fixed position relative to the ferrule body; and	Lint discloses: "A barb 19 is contained in each of the slots 18 and is pivoted to the tubular body 12 by means of a pivot pin 20." Ex. 1002, 2:43-45 and Fig. 2. Figures 2 and 3 disclose that the pivotal interconnection between the second blade member and the ferrule body is at a fixed position relative to the ferrule body. I include annotated version of Figure 2 in Paragraph 72 below.

Claim 11 of '177 Patent	Lint
at least one biasing member biasing the first and second blade members towards the extended positions.	Lint discloses: “ A spring 24 is provided within the bore 14 of the body 12 and extends between the tip portion 11 of the arrowhead 10 and the forward surface of the transversely extending inner barb portions 22. This spring operates to bias the barbs 19 in the open position illustrated by FIGURE 2. ” Ex. 1002, 2:53-58 and Fig. 2. I include an annotated version of Figure 2 in Paragraph 71 below.

Claim 12 of '177 Patent	Lint
A broadhead in accordance with claim 11, wherein: the pivotal interconnection between the first blade member and the ferrule body and the pivotal interconnection between the second blade member and the ferrule body are substantially equidistant from the forward end of the ferrule.	As shown in Figure 2 in Lint, the pivotal interconnections between the first blade member and the ferrule body and between the second blade member and the ferrule body are substantially equidistant from the forward end of the ferrule. Ex. 1002, Fig. 2. I include an annotated version of Figure 2 in Paragraph 73 below.

Claim 15 of '177 Patent	Lint
A broadhead in accordance with claim 11, a retaining element engaging the blade members to maintain the blade members in the retracted position.	Lint discloses: “To remove the arrowhead from the animal, the barbs may be again retracted by threading the shaft 17 into the bore 14 until the shaft contacts the outer surfaces of the inner barb portions 22. When this contact occurs, further inward threading of the shaft within the bore 14 will cause the barbs 19 to be retracted within the slots 18, as illustrated by FIGURE 3. ” Ex. 1002,

Claim 15 of '177 Patent	Lint
	2:70-3:4. I include an annotated version of Figure 3 in Paragraph 75 below.

Claim 17 of '177 Patent	Lint
A broadhead in accordance with claim 11, wherein: the biasing member is a coil spring.	Lint discloses: “ A spring 24 is provided within the bore 14 of the body 12 and extends between the tip portion 11 of the arrowhead 10 and the forward surface of the transversely extending inner barb portions 22. This spring operates to bias the barbs 19 in the open position illustrated by FIGURE 2. ” Ex. 1002, 2:53-58 and Fig. 2.

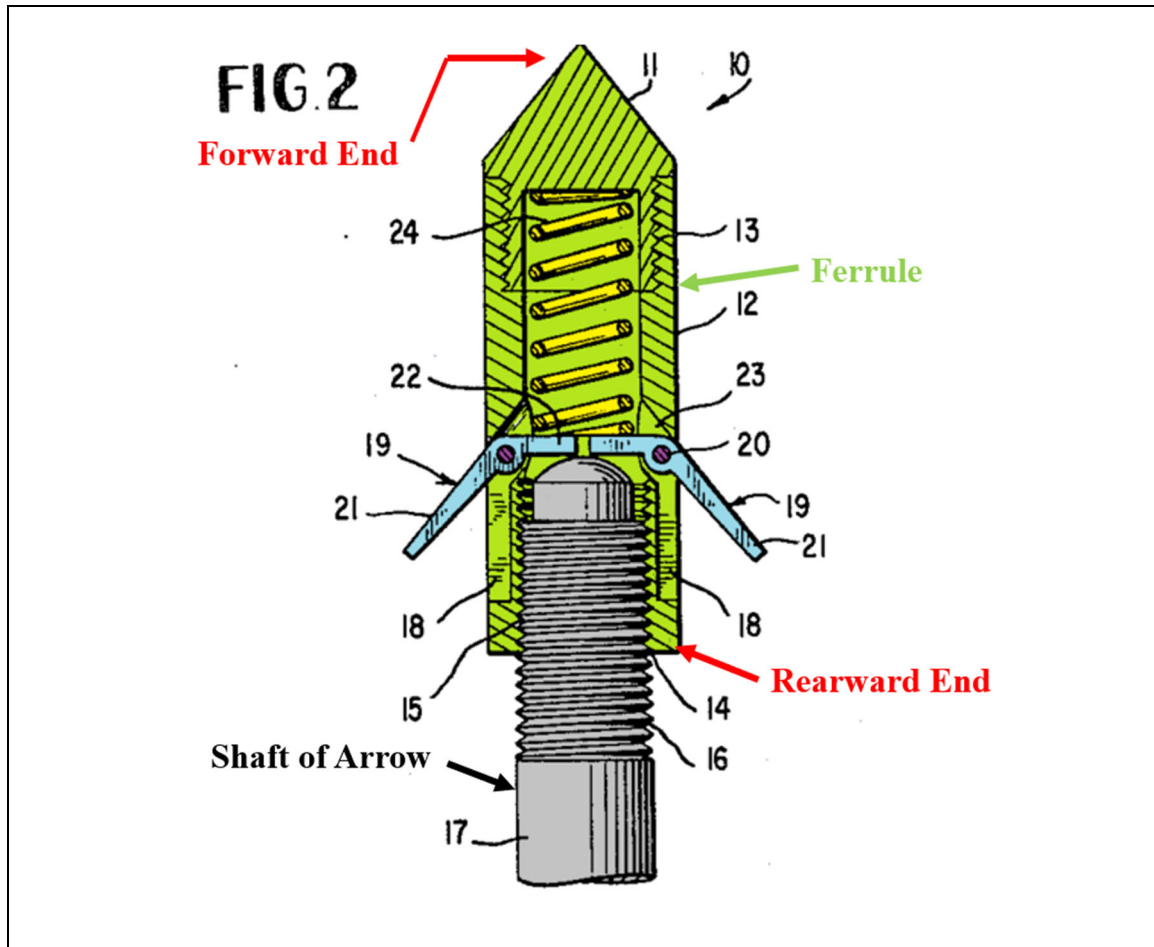
65. With regard to claims 1-4, 7, 9, 11, 12, 15, and 17 of the '177 patent, as can be seen in the above chart, Lint discloses all the requirements. I further address these claims below.

CLAIM 1 – “A broadhead for an arrow having a shaft, the broadhead comprising:”

66. Lint discloses an “arrowhead” that “includes a forward or pointed tip portion 11 and a body portion 12 . . . The body 12 is of a generally tubular shape and is provided with a bore 14 which is internally threaded as indicated at 15. The threads 15 of the bore 14 engage with threads 16 provided upon one end of an arrow shaft 17.” Ex. 1002, 2:29-38.

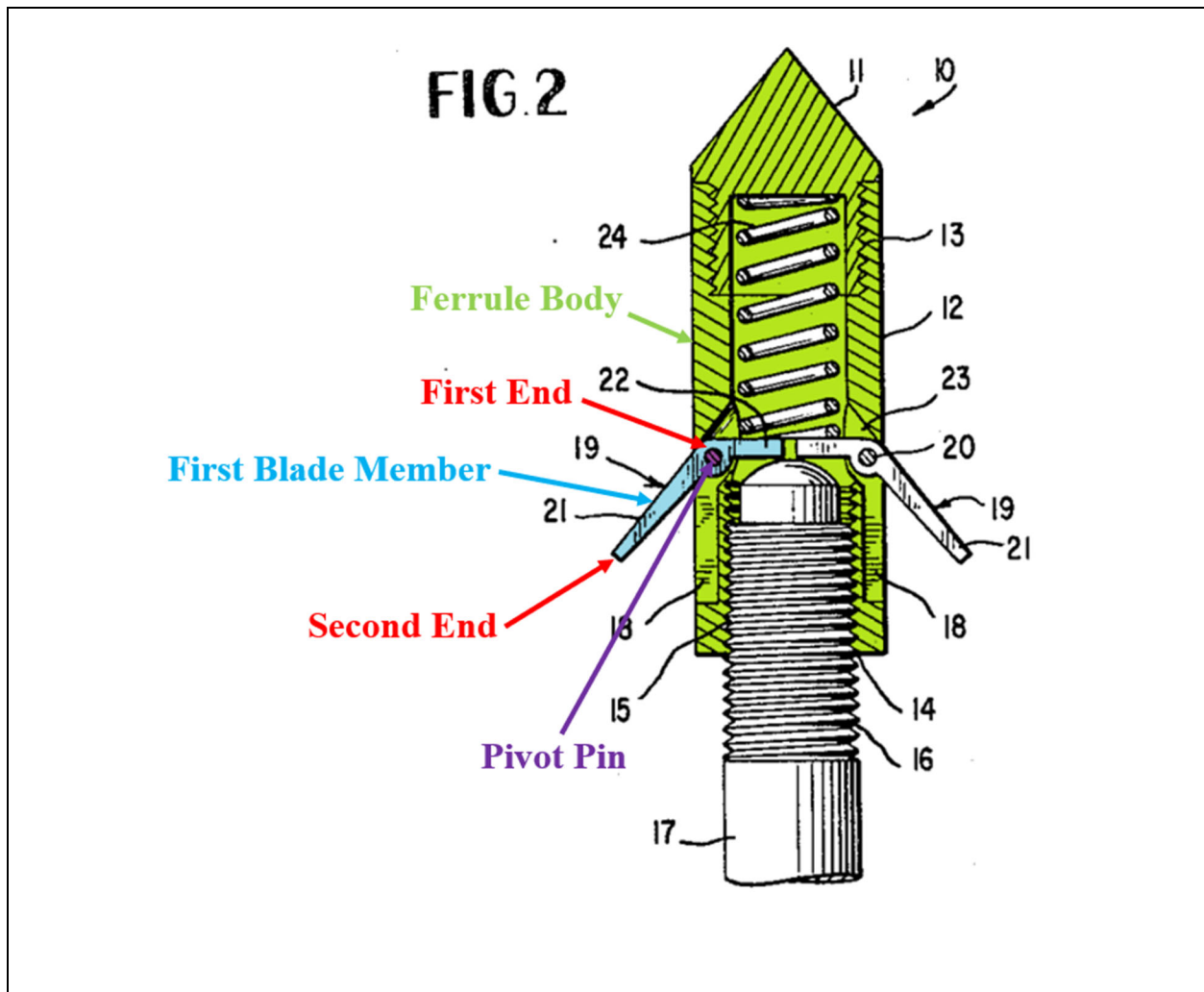
CLAIM 1 – “a ferrule having a rearward end configured for attachment to the shaft and an opposite forward end with a ferrule body extending therebetween;”

67. Lint discloses this requirement of claim 1. Lint discloses that “the arrowhead of the present invention indicated generally at 10 includes a forward or pointed tip portion 11 and a body portion 12. The tip portion 11 may be removably attached to the body portion 12, as indicated at 13 in FIGURES 2 and 3, or the tip may be integrally secured to the body 12. The body 12 is of a generally tubular shape and is provided with a bore 14 which is internally threaded as indicated at 15. The threads 15 of the bore 14 engage with threads 16 provided upon one end of an arrow shaft 17.” Ex. 1002, 2:29-38 and Fig. 2. I include an annotated version of Figure 2 of Lint below.



CLAIM 1 – “a first blade member having a first end pivotally interconnected with the ferrule body and an opposite second end,”

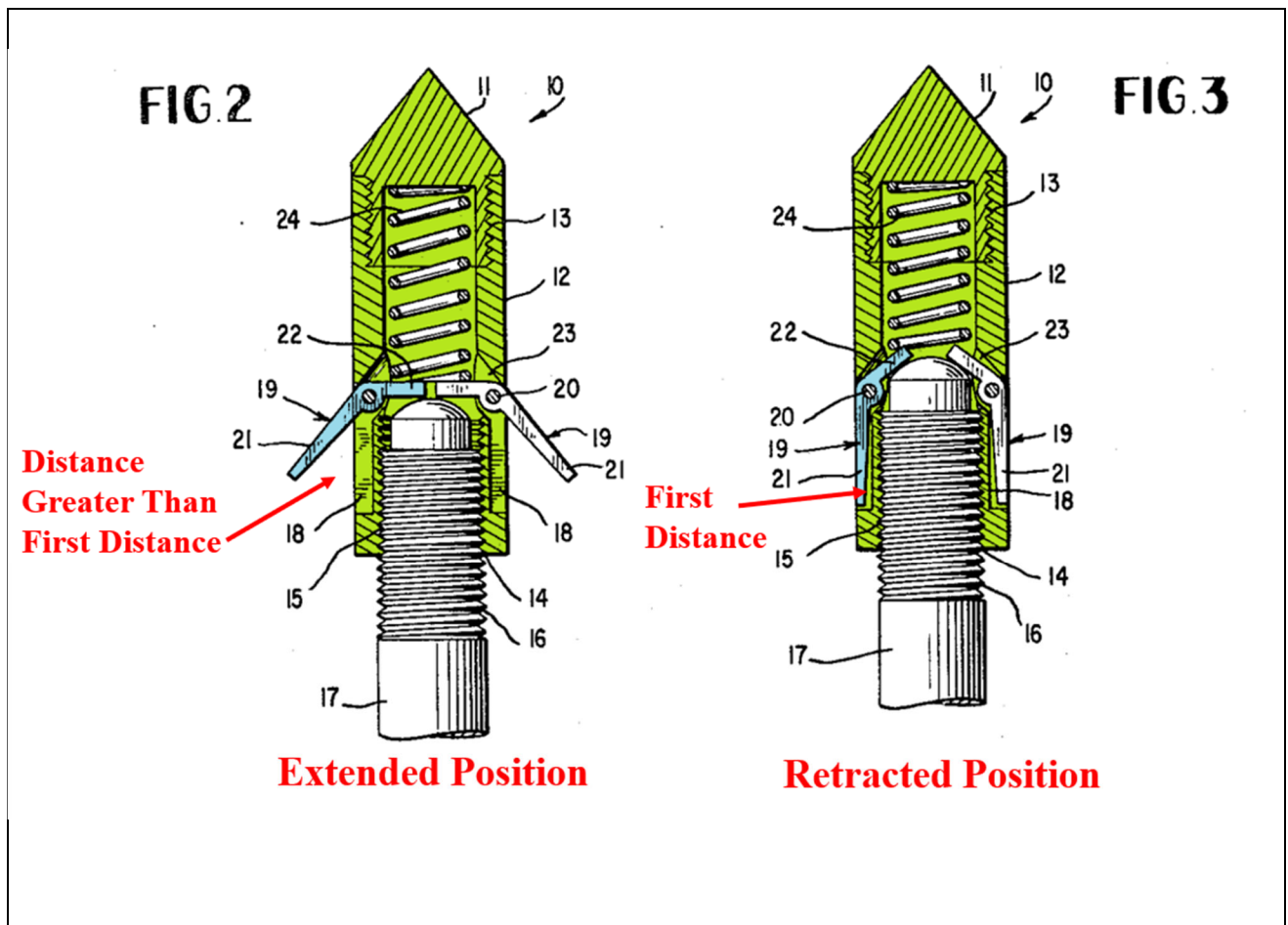
68. Lint discloses this claim requirement of claim 1. Lint discloses: “The tubular body 12 of the arrowhead 10 is provided with two longitudinally extending slots or depressions 18 which are oppositely disposed at either side of the body 12. A barb 19 is contained in each of the slots 18 and is pivoted to the body 12 by means of a pivot pin 20.” Ex. 1002, 2:39-45 and Fig. 2. I include an annotated version of Figure 2 of Lint below.



CLAIM 1 – “the first blade member having a retracted position wherein the second end is spaced from the ferrule body at a first distance and an extended position wherein the second end is spaced from the ferrule body by a distance which is greater than the first distance;”

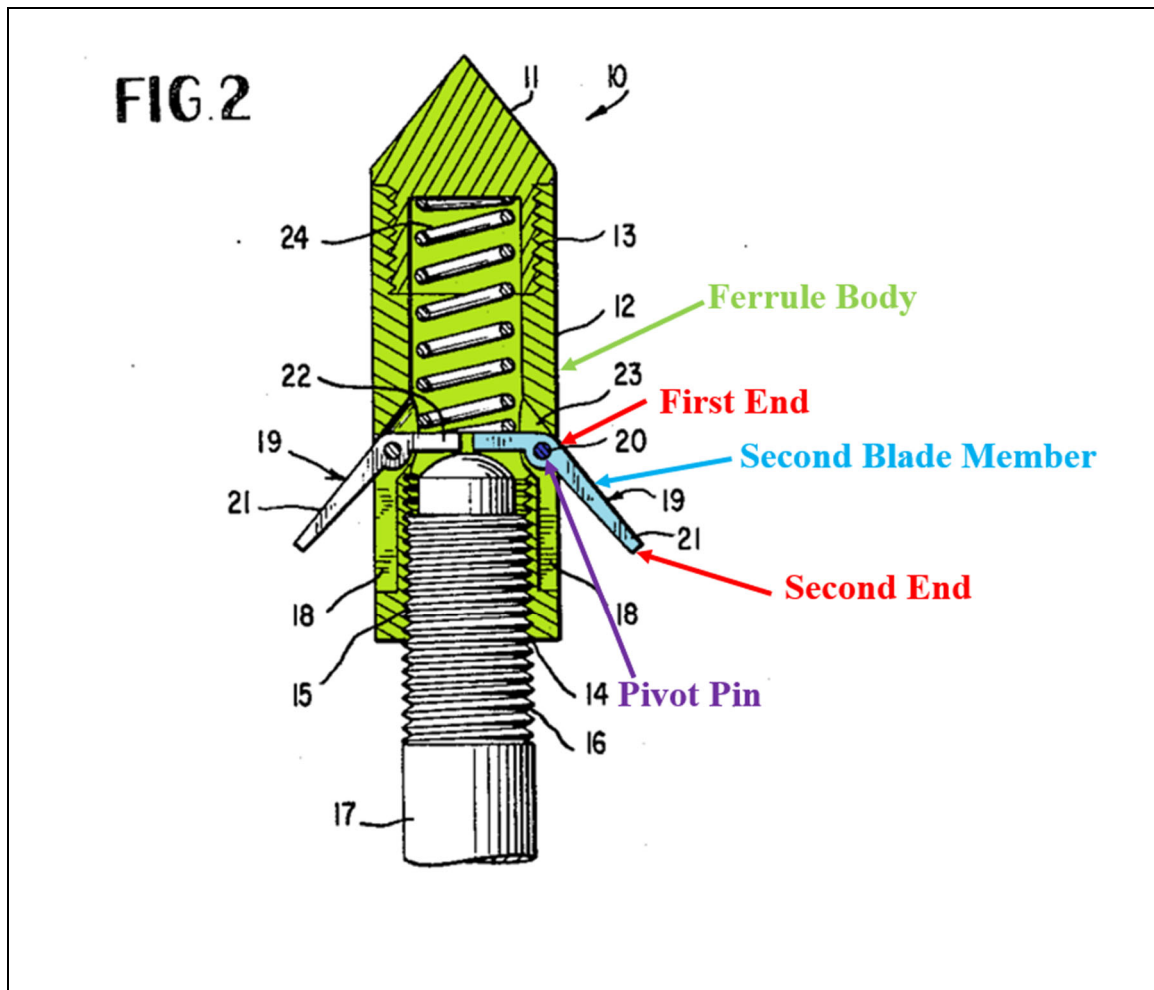
69. Lint discloses this claim requirement of claim 1. Lint discloses: “Each of said barbs 19 includes an outer barb portion 21 which projects outwardly and rearwardly of the arrowhead body 12 when the barbs 19 are in the open position as

illustrated by FIGURE 2.” Ex. 1002, 2:45-48 and Fig. 2. Lint discloses “when the arrowhead 10 penetrates the flesh of an animal, the initial impact on the outer portions 21 of the barbs 19 causes the barbs to be retracted into the slots 18 against the bias of the spring 24.” Ex. 1002, 2:64-67. Figures 2 and 3 of Lint shows that the space between the first blade member and the ferrule body is greater when the first blade member is in an extended position. Ex. 1002, Figs. 2 and 3. I included annotated versions of Figures 2 and 3 below.



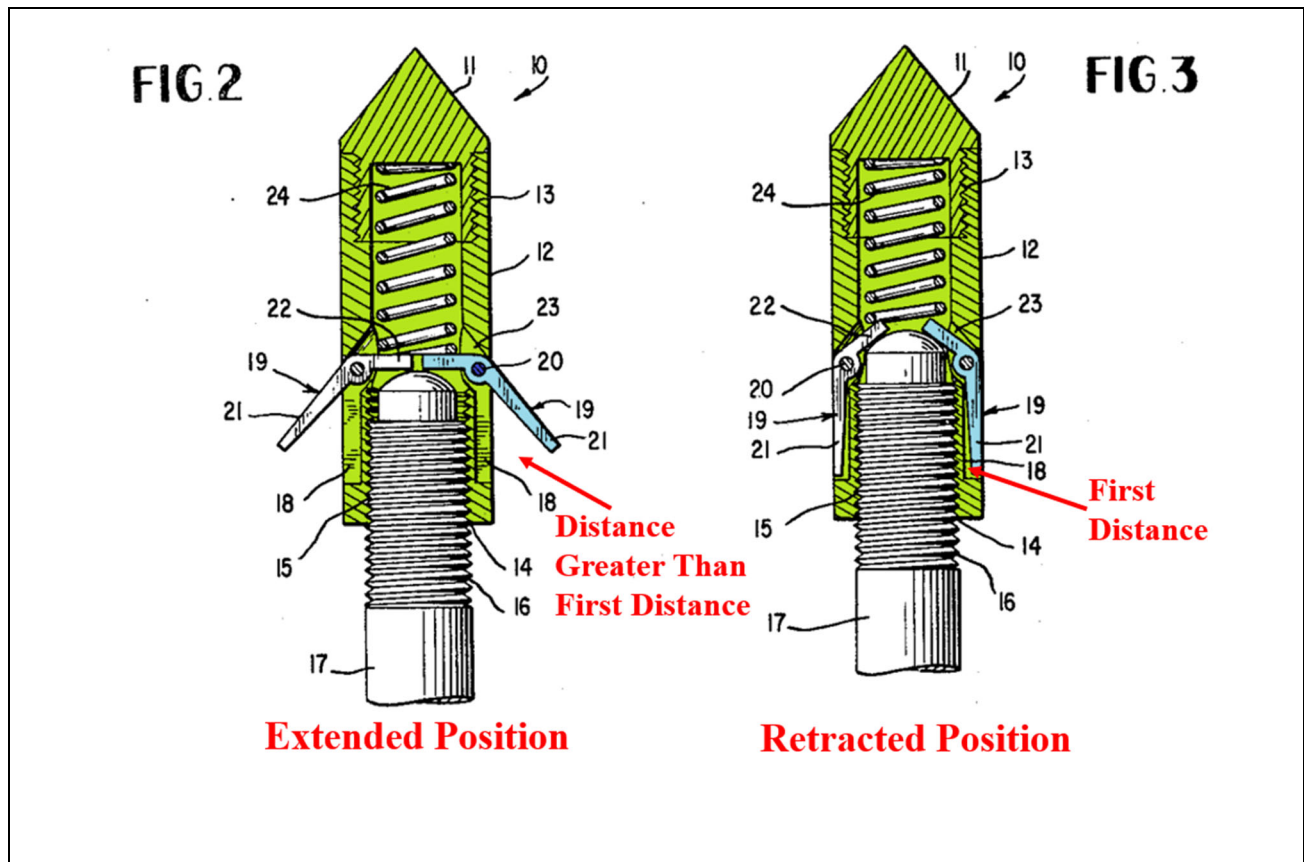
CLAIM 1 – “a second blade member having a first end pivotally interconnected with the ferrule body and an opposite second end,”

70. Lint discloses this claim requirement of claim 1. Lint discloses: “The tubular body 12 of the arrowhead 10 is provided with two longitudinally extending slots or depressions 18 which are oppositely disposed at either side of the body 12. A barb 19 is contained in each of the slots 18 and is pivoted to the body 12 by means of a pivot pin 20.” (Ex. 1002, 2:39-45 and Fig. 2. I include an annotated version of Figure 2 below.



CLAIM 1 – “the [second] blade member having a retracted position wherein the second end is spaced from the ferrule body at a first distance and an extended position wherein the second end is spaced from the ferrule body by a distance which is greater than the first distance; and”

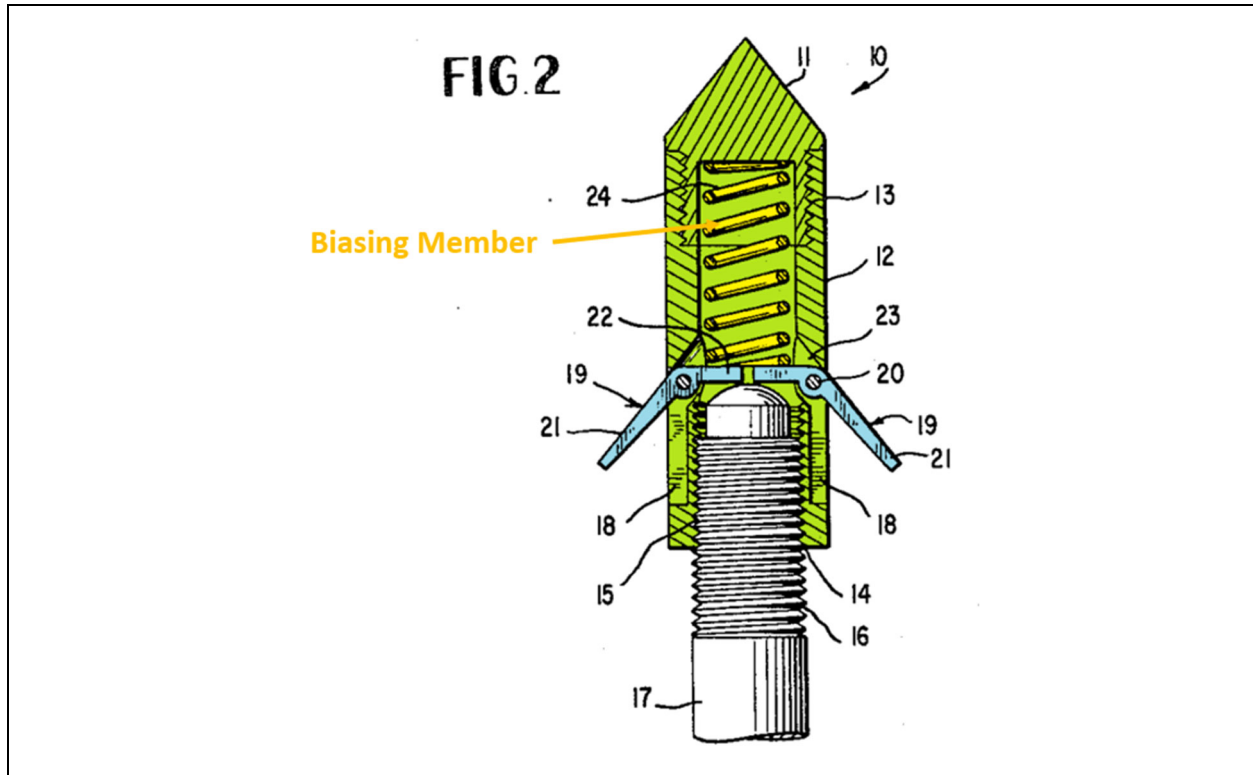
71. Lint discloses this claim requirement of claim 1. Lint discloses: “Each of said barbs 19 includes an outer barb portion 21 which projects outwardly and rearwardly of the arrowhead body 12 when the barbs 19 are in the open position as illustrated by FIGURE 2.” Ex. 1002, 2:45-48 and Fig. 2. Lint discloses “when the arrowhead 10 penetrates the flesh of an animal, the initial impact on the outer portions 21 of the barbs 19 causes the barbs to be retracted into the slots 18 against the bias of the spring 24.” Ex. 1002, 2:64-67. Figures 2 and 3 of Lint shows that the space between the second blade member and the ferrule body is greater when the second blade member is in an extended position. Ex. 1002, Figs. 2 and 3. I include annotated versions of Figures 2 and 3 below.



CLAIM 1 – “at least one biasing member biasing the first and second blade members towards the extended positions, the biasing member being the only element operable to hold the blade members in the extended position.”

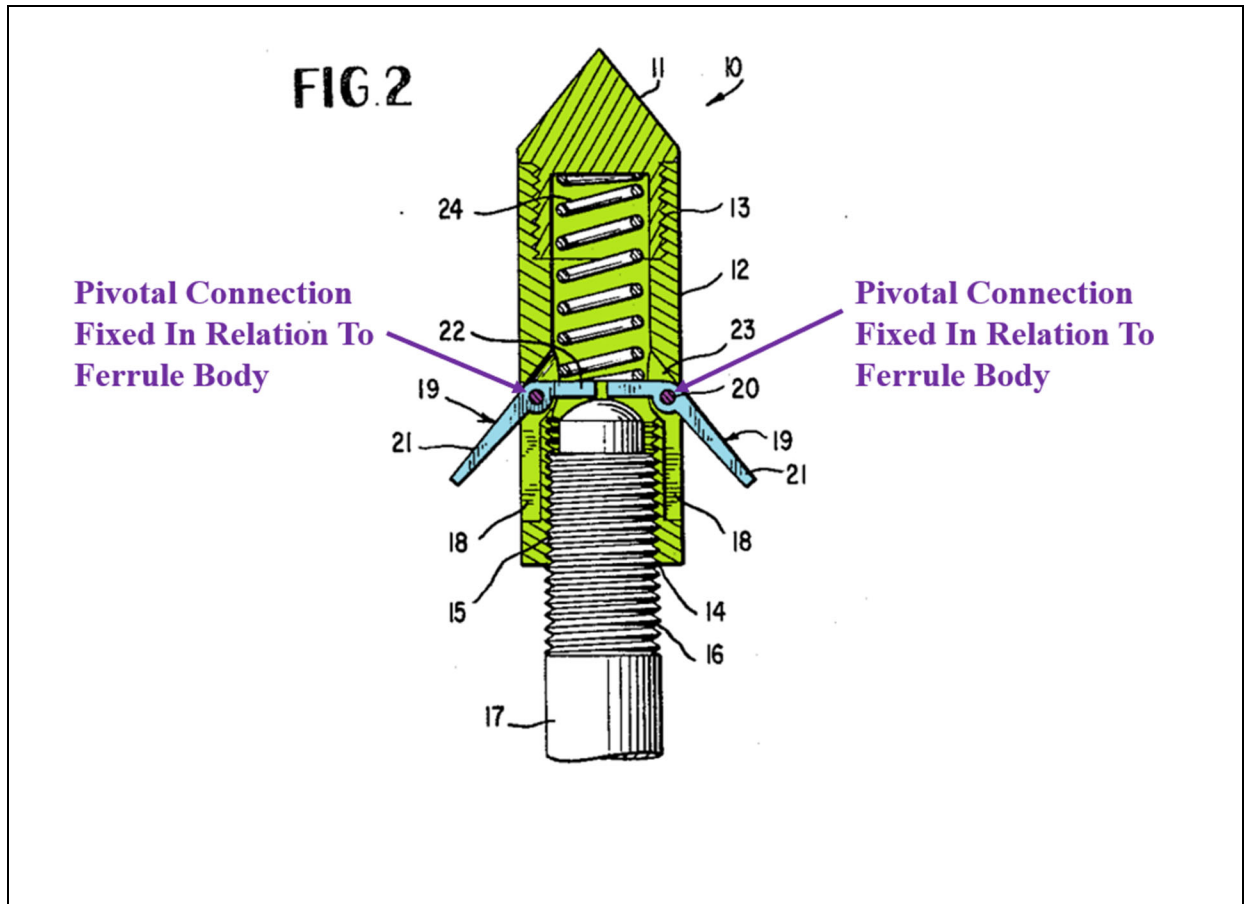
72. Lint discloses this requirement of claim 1. Lint discloses: “A spring 24 is provided within the bore 14 of the body 12 and extends between the tip portion 11 of the arrowhead 10 and the forward surface of the transversely extending inner barb portions 22. This spring operates to bias the barbs 19 in the open position illustrated by FIGURE 2.” Ex. 1002, 2:53-58 and Fig. 2. As shown in Figure 2 in Lint, the

spring is the only element operable to hold the blade members in the extended position. I include an annotated version of Figure 2 below.



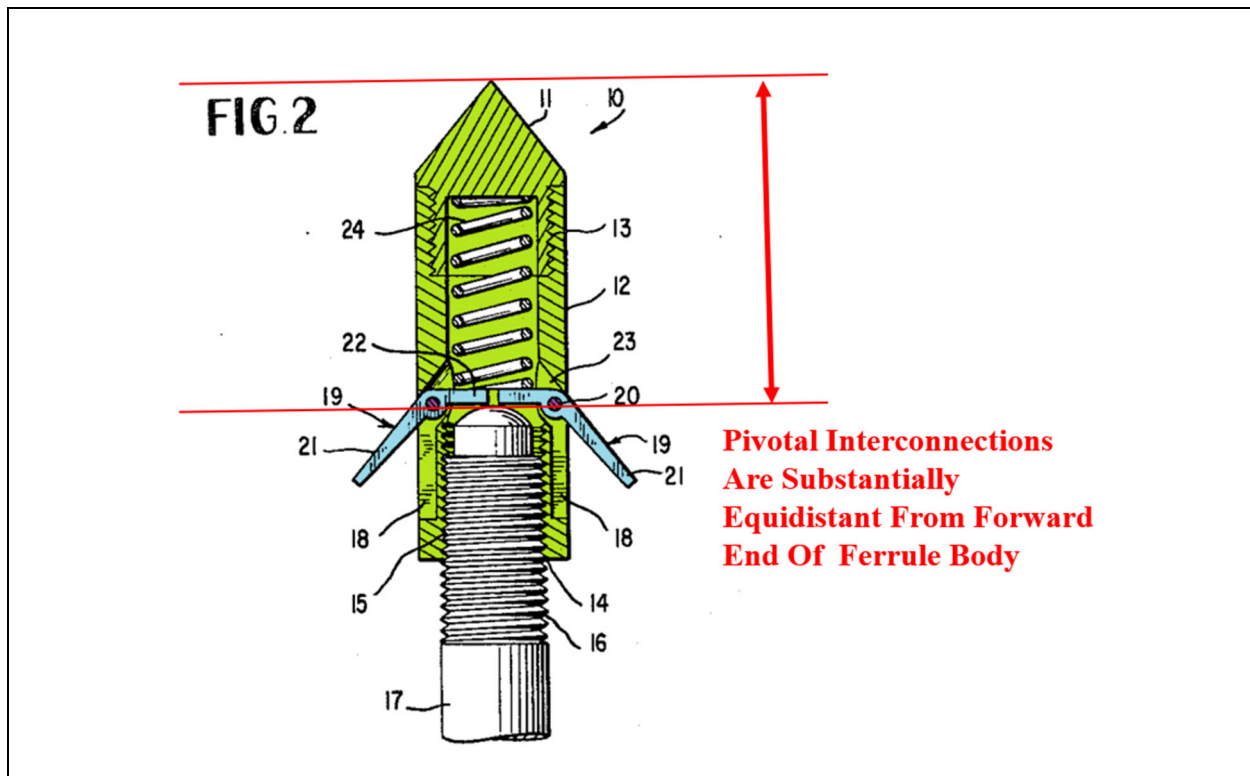
CLAIM 2 – “wherein: the pivotal interconnection between the first blade member and the ferrule body is at a fixed position relative to the ferrule body; and the pivotal interconnection between the second blade member and the ferrule body being at a fixed position relative to the ferrule body.”

73. Lint discloses this requirement of claim 2. As shown in Figures 2 and 3 of Lint, the pivotal interconnections between the first blade member and the ferrule body and between the second blade member and the ferrule body are fixed position relative to the ferrule body. Ex. 1002, Figs. 2 and 3. I include an annotated version of Figure 2 below.



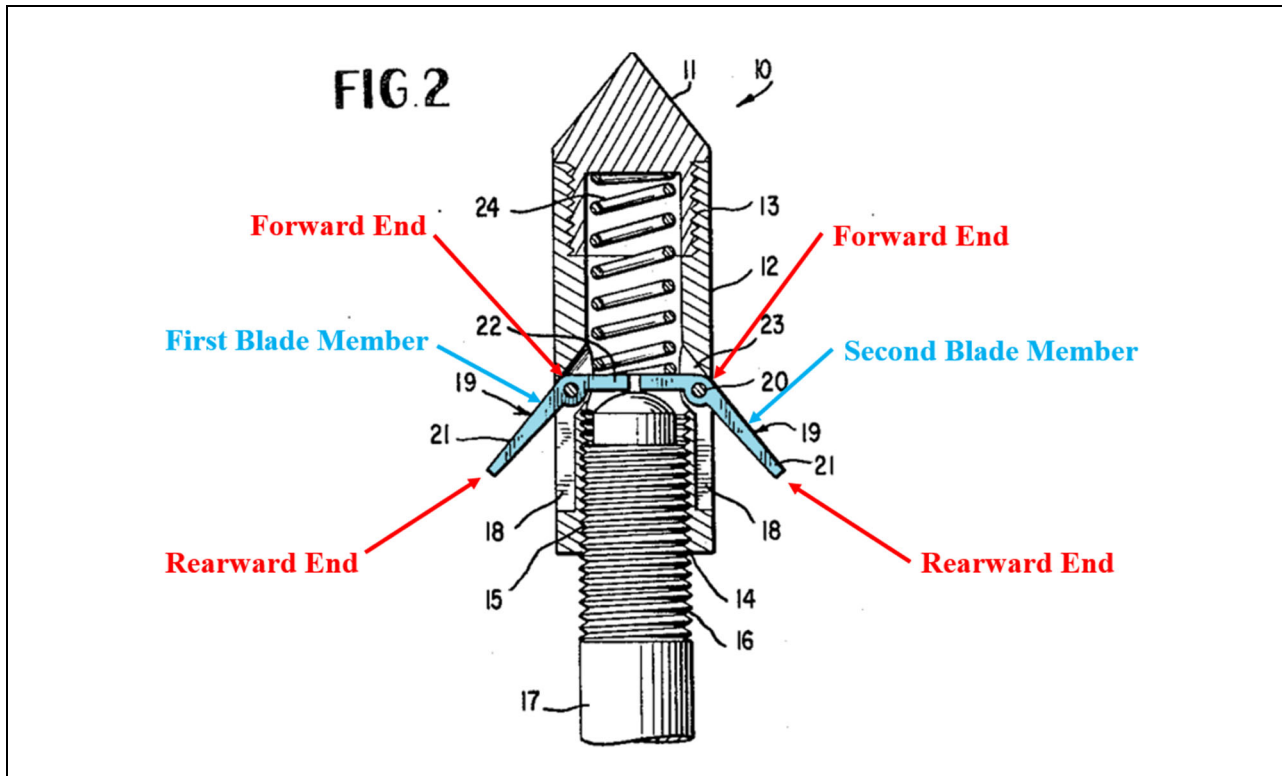
CLAIM 3 – “wherein: the pivotal interconnection between the first blade member and the ferrule body and the pivotal interconnection between the second blade member and the ferrule body are substantially equidistant from the forward end of the ferrule.”

74. Lint discloses this requirement of claim 3. As shown in Figure 2 of Lint, the pivotal interconnections between the first blade member and the ferrule body and between the second blade member and the ferrule body are substantially equidistant from the forward end of the ferrule. Ex. 1002, Fig. 2. I include an annotated version of Figure 2 below.



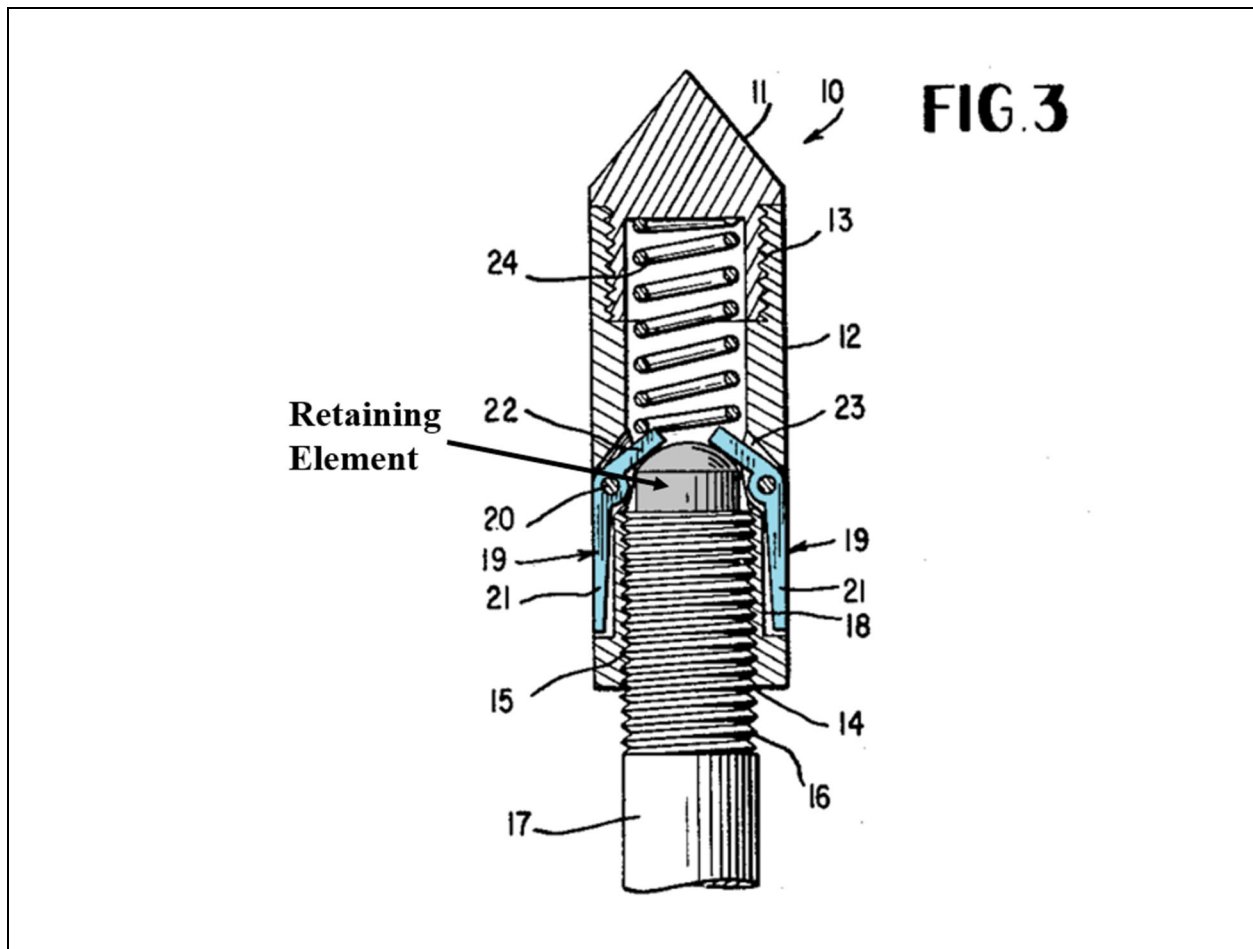
CLAIM 4 – “wherein: the first ends of the first and second blade members are forward ends and the second ends are rearward ends.”

75. Lint discloses this requirement of claim 4. Lint discloses: “A barb 19 is contained in each of the slots 18 and is pivoted to the tubular body 12 by means of a pivot pin 20. Each of said barbs 19 includes an outer barb portion 21 which projects outwardly and rearwardly of the arrowhead body 12 when the barbs 19 are in the open position as illustrated by FIGURE 2. Outer barb portions 21 extend angularly from the inner barb ends 22 which project through the forward portions 23 of the slots 18 into the bore 14 of the tubular body 12.” Ex. 1002, 2:42-50. I include an annotated version of Figure 2 below.



CLAIM 7 – “a retaining element engaging the blade members to maintain the blade members in the retracted position.”

76. Lint discloses this requirement of claim 7. Lint discloses: “To remove the arrowhead from the animal, the barbs may be again retracted by threading the shaft 17 into the bore 14 until the shaft contacts the outer surfaces of the inner barb portions 22. When this contact occurs, further inward threading of the shaft within the bore 14 will cause the barbs 19 to be retracted within the slots 18, as illustrated by FIGURE 3.” Ex. 2:70-3:4. I include an annotated version of Figure 3 below.



CLAIM 9 – “wherein: the biasing member is a coil spring.”

77. Lint discloses this requirement of claim 9. Lint discloses: “A spring 24 is provided within the bore 14 of the body 12 and extends between the tip portion 11 of the arrowhead 10 and the forward surface of the transversely extending inner barb portions 22. This spring operates to bias the barbs 19 in the open position illustrated by FIGURE 2.” Ex. 1002, 2:53-58 and Fig. 2.

CLAIM 11 – “A broadhead for an arrow having a shaft, the broadhead comprising:”

78. With respect to claim 11, Lint discloses an “arrowhead” that “includes a forward or pointed tip portion 11 and a body portion 12 . . . The body 12 is of a generally tubular shape and is provided with a bore 14 which is internally threaded as indicated at 15. The threads 15 of the bore 14 engage with threads 16 provided upon one end of an arrow shaft 17.” Ex. 1002, 2:29-38.

CLAIM 11 – “a ferrule having a rearward end configured for attachment to the shaft and an opposite forward end with a ferrule body extending therebetween,”

79. Lint discloses this requirement of claim 11. Lint discloses that “the arrowhead of the present invention indicated generally at 10 includes a forward or pointed tip portion 11 and a body portion 12. The tip portion 11 may be removably attached to the body portion 12, as indicated at 13 in FIGURES 2 and 3, or the tip may be integrally secured to the body 12. The body 12 is of a generally tubular shape and is provided with a bore 14 which is internally threaded as indicated at 15. The threads 15 of the bore 14 engage with threads 16 provided upon one end of an arrow shaft 17.” Ex. 1002, 2:29-38 and Fig. 1. I include an annotated version of Figure 2 of Lint in Paragraph 66.

CLAIM 11 – “the forward end of the ferrule defining the forward tip of the arrow and being fixed with respect to the ferrule body;”

80. Lint discloses this requirement of claim 11. Lint discloses: “[T]he arrowhead of the present invention indicated generally at 10 includes a forward or pointed tip portion 11 and a body portion 12. The tip portion 11 may be removably attached to the body portion 12, as indicated at 13 in FIGURES 2 and 3, or the tip may be integrally secured to the body 12.” Ex. 1002, 2:29-34.

CLAIM 11 – “a first blade member having a forward end pivotally interconnected with the ferrule body and an opposite rearward end,”

81. Lint discloses this requirement of claim 11. Lint discloses: “A barb 19 is contained in each of the slots 18 and is pivoted to the tubular body 12 by means of a pivot pin 20.” Ex. 1002, 2:43-45 and Fig. 2. I include an annotated version of Figure 2 in Paragraph 67.

CLAIM 11 – “the first blade member having a retracted position wherein the rearward end is spaced from the ferrule body at a first distance and an extended position wherein the rearward end is spaced from the ferrule body by a distance which is greater than the first distance,”

82. Lint discloses this requirement of claim 11. Lint discloses: “Each of said barbs 19 includes an outer barb portion 21 which projects outwardly and rearwardly of the arrowhead body 12 when the barbs 19 are in the open position as illustrated by FIGURE 2.” Ex. 1002, 2:45-48; Fig. 2 and Fig. 3. Figures 2 and 3 of

Lint show that the space between the first blade member and the ferrule body is greater when the first blade member is in an extended position. Ex. 1002, Figs. 2 and 3. I include annotated versions of Figures 2 and 3 in Paragraph 68.

CLAIM 11 – “the pivotal interconnection between the first blade member and the ferrule body being at a fixed position relative to the ferrule body;”

83. Lint discloses this requirement of claim 11. Lint discloses: “A barb 19 is contained in each of the slots 18 and is pivoted to the tubular body 12 by means of a pivot pin 20.” Ex. 1002, 2:43-45; Fig. 2 and Fig. 3. Figures 2 and 3 disclose that the pivotal interconnection between the first blade member and the ferrule body is at a fixed position relative to the ferrule body. I include an annotated version of Figure 2 in Paragraph 72.

CLAIM 11 – “a second blade member having a forward end pivotally interconnected with the ferrule body and an opposite rearward end,”

84. Lint discloses this requirement of claim 11. Lint discloses: “A barb 19 is contained in each of the slots 18 and is pivoted to the tubular body 12 by means of a pivot pin 20.” Ex. 1002, 2:43-45 and Fig. 2. I include an annotated version of Figure 2 in Paragraph 69.

CLAIM 11 – “the second blade member having a retracted position wherein the rearward end is spaced from the ferrule body at a first distance and an extended position wherein the rearward end is spaced from the ferrule body by a distance which is greater than the first distance,”

85. Lint discloses this requirement of claim 11. Lint discloses: “Each of said barbs 19 includes an outer barb portion 21 which projects outwardly and rearwardly of the arrowhead body 12 when the barbs 19 are in the open position as illustrated by FIGURE 2.” Ex. 1002, 2:45-48 and Fig. 2. Figures 2 and 3 of Lint show that the space between the second blade member and the ferrule body is greater when the second blade member is in an extended position. Ex. 1002, Figs. 2 and 3. I included annotated versions of Figures 2 and 3 in Paragraph 70.

CLAIM 11 – “the pivotal interconnection between the second blade member and the ferrule body being at a fixed position relative to the ferrule body; and”

86. Lint discloses this requirement of claim 11. Lint discloses: “A barb 19 is contained in each of the slots 18 and is pivoted to the tubular body 12 by means of a pivot pin 20.” Ex. 1002, 2:43-45; Fig. 2 and Fig. 3. Figures 2 and 3 disclose that the pivotal interconnection between the second blade member and the ferrule body is at a fixed position relative to the ferrule body. I include an annotated version of Figure 2 in Paragraph 72.

CLAIM 11 – “at least one biasing member biasing the first and second blade members towards the extended positions.”

87. Lint discloses this requirement of claim 11. Lint discloses: “A spring 24 is provided within the bore 14 of the body 12 and extends between the tip portion 11 of the arrowhead 10 and the forward surface of the transversely extending inner barb portions 22. This spring operates to bias the barbs 19 in the open position illustrated by FIGURE 2.” Ex. 1002, 2:53-58 and Fig. 2. I include an annotated version of Figure 2 in Paragraph 71.

CLAIM 12 – “wherein: the pivotal interconnection between the first blade member and the ferrule body and the pivotal interconnection between the second blade member and the ferrule body are substantially equidistant from the forward end of the ferrule.”

88. Lint discloses this requirement of claim 12. As shown in Figure 2 in Lint, the pivotal interconnections between the first blade member and the ferrule body and between the second blade member and the ferrule body are substantially equidistant from the forward end of the ferrule. Ex. 1002, Fig. 2. I include an annotated version of Figure 2 in Paragraph 73.

CLAIM 15 – “a retaining element engaging the blade members to maintain the blade members in the retracted position.”

89. Lint discloses this requirement of claim 15. Lint discloses: “To remove the arrowhead from the animal, the barbs may be again retracted by threading the shaft 17 into the bore 14 until the shaft contacts the outer surfaces of the inner

barb portions 22. When this contact occurs, further inward threading of the shaft within the bore 14 will cause the barbs 19 to be retracted within the slots 18, as illustrated by FIGURE 3.” Ex. 1002, 2:70-3:4. I include an annotated version of Figure 3 in Paragraph 75.

CLAIM 17 – “wherein: the biasing member is a coil spring.”

90. Lint discloses this requirement of claim 17. Lint discloses: “A spring 24 is provided within the bore 14 of the body 12 and extends between the tip portion 11 of the arrowhead 10 and the forward surface of the transversely extending inner barb portions 22. This spring operates to bias the barbs 19 in the open position illustrated by FIGURE 2.” Ex. 1002, 2:53-58 and Fig. 2.

B. Ground II: Vandewater Discloses Every Limitation of Claims 11, 12, 15, and 17

91. I have compared claims 11, 12, 15, and 17 to Vandewater. It is my opinion that the Vandewater discloses each and every limitation of claims 11, 12, 15, and 17. Below, I address each claim limitation.

Claim 11 of ‘177 Patent	Vandewater
A broadhead for an arrow having a shaft, the broadhead comprising:	Vandewater discloses “ pivotable arrowhead for an arrow . . . ” Ex. 1003, 2:33-34. Vandewater discloses that the arrowhead has a “ body 14 ” and “may further include an externally threaded portion 32 for connection to an arrow shaft . In such a configuration, arrowhead 10 may be used as an arrowhead attached to a

Claim 11 of '177 Patent	Vandewater
	conventional arrow shaft or bolt for use with a bow or crossbow. Optionally, it is envisioned that arrowhead 10 may be unitarily formed with or otherwise attached to a shaft of an arrow, while remaining within the spirit and scope of the present invention.” Ex. 1003, 3:29-36. ²
a ferrule having a rearward end configured for attachment to the shaft and an opposite forward end with a ferrule body extending therebetween,	Vandewater discloses that “body 14 has an elongated shape, such as a cylindrical shape, and may have a substantially pointed portion or tip 26.” Ex. 1003, 5:13-15. Vandewater further discloses that body 14 “may further include an externally threaded portion 32 for connection to an arrow shaft.” Ex. 1003, 3:29-30. ³ I include an annotated version of Figure 16 of Vandewater in Paragraph 93 below.
the forward end of the ferrule defining the forward tip of the arrow and being fixed with respect to the ferrule body;	Vandewater discloses that a “body 14 has an elongated shape, such as a cylindrical shape, and may have a substantially pointed portion or tip 26.” Ex. 1003, 5:13-15. ⁴ As shown in Figure 16 in Vandewater, for example, the forward tip is fixed with respect to the ferrule body. I include

² Support for Vandewater’s disclosure is found in Provisional Patent Application No. 61/038,286 (Ex. 1004) at Paragraph Nos. [0003] and [0019], for example.

³ Support for Vandewater’s disclosure is found in Provisional Patent Application No. 61/038,286 (Ex. 1004) at Paragraph No. [0018], for example.

⁴ Support for Vandewater’s disclosure is found in Provisional Patent Application No. 61/038,286 (Ex. 1004) at Paragraph No. [0018], for example.

Claim 11 of '177 Patent	Vandewater
	an annotated version of Figure 16 of Vandewater in Paragraph 94 below.
a first blade member having a forward end pivotally interconnected with the ferrule body and an opposite rearward end,	Vandewater discloses: “The pivot connection between blades 212 and 213 and body 214 allows the blades to fold or deploy and to pivot after deployment, and may be made with a set screw or other threaded connector or the like. Alternatively, the pivot connection may be established with an interference-fit pin, cotter pin, or other such device, as will be apparent to the skilled artisan.” Ex. 1003, 7:33-39. ⁵ Figure 16 of Vandewater shows the first blade member having a forward end pivotally interconnected with the ferrule body and an opposite rearward end. I include an annotated version of Figure 16 of Vandewater in Paragraph 95 below.
the first blade member having a retracted position wherein the rearward end is spaced from the ferrule body at a first distance and an extended position wherein the rearward end is spaced from the ferrule body by a distance which is greater than the first distance,	Vandewater discloses: “Upon impact with an object such as an animal, first blade 212 and second blade 213, responding to forces exerted on first opening lever 224 and second opening lever 225, respectively, pivot to a deployed position (FIG. 8), thereby forming a broad cutting blade for promoting an increased rate of bleeding and a more humane kill. Further, when in the deployed

⁵ Support for Vandewater’s disclosure is found in Provisional Patent Application No. 61/038,286 (Ex. 1004) at Paragraph Nos.[0036] and [0037] and Figures 7-8, for example.

Claim 11 of '177 Patent	Vandewater
	position, the interlocked blades may pivot about pivot point 234 relative to the arrowhead body, such as in a similar manner as described above.” Ex. 1003, 7:45-54.⁶ Figures 15 and 16 in Vandewater shows that the space between the first blade member and the ferrule body is greater when the first blade member is in an extended position. Ex. 1003, Figs. 15 and 16.⁷ I include annotated versions of Figures 15 and 16 of Vandewater in Paragraph 97 below.
the pivotal interconnection between the first blade member and the ferrule body being at a fixed position relative to the ferrule body;	Figure 16 in Vandewater, for example, discloses that the pivotal interconnection between the first blade member and the ferrule body is at a fixed position relative to the ferrule body. Ex. 1003, Fig. 16. I include an annotated version of Figure 16 of Vandewater in Paragraph 98 below.
a second blade member having a forward end pivotally interconnected with the ferrule body and an opposite rearward end,	Vandewater discloses: “The pivot connection between blades 212 and 213 and body 214 allows the blades to fold or deploy and to pivot after deployment” Ex. 1003, 7:33-35. Figure 16 in Vandewater, for example,

⁶ Support for Vandewater’s disclosure is found in Provisional Patent Application No. 61/038,286 (Ex. 1004) at Paragraph No. [00037] and Figures 7 and 8, for example.

⁷ Support for Vandewater’s disclosure is found in Provisional Patent Application No. 61/038,286 (Ex. 1004) at Figures 7 and 8, for example.

Claim 11 of '177 Patent	Vandewater
	discloses that the second blade member has a forward end and an opposite rearward end . Ex. 1003, Fig. 16. I include an annotated version of Figure 16 of Vandewater in Paragraph 99 below.
the second blade member having a retracted position wherein the rearward end is spaced from the ferrule body at a first distance and an extended position wherein the rearward end is spaced from the ferrule body by a distance which is greater than the first distance,	Vandewater discloses: “The pivot connection between blades 212 and 213 and body 214 allows the blades to fold or deploy and to pivot after deployment, and may be made with a set screw or other threaded connector or the like. Alternatively, the pivot connection may be established with an interference-fit pin, cotter pin, or other such device, as will be apparent to the skilled artisan.” Ex. 1003, 7:33-39.⁸ Figures 15 and 16 in Vandewater shows that the space between the second blade member and the ferrule body is greater when the second blade member is in an extended position. Ex. 1003, Figs. 15 and 16. I include annotated versions of Figures 15 and 16 of Vandewater in Paragraph 101 below.
the pivotal interconnection between the second blade member and the ferrule body being at a fixed position relative to the ferrule body; and	Figures 15 and 16 in Vandewater, for example, disclose that the pivotal interconnection between the second blade member and the ferrule body

⁸ Support for Vandewater’s disclosure is found in Provisional Patent Application No. 61/038,286 (Ex. 1004) at Paragraph Nos. [0036] and [0037] and Figures 7 and 8, for example.

Claim 11 of '177 Patent	Vandewater
	is at a fixed position relative to the ferrule body. Ex. 1003, Figs. 15 and 16. I include an annotated version of Figure 16 of Vandewater in Paragraph 102 below.
at least one biasing member biasing the first and second blade members towards the extended positions.	Vandewater discloses: “Optionally, a retaining mechanism (not shown in FIGS. 7-12) may also be utilized with arrowhead 210, such as a biasing element with a ball bearing or a spring wheel in accordance with retaining mechanisms disclosed herein . . . the retaining mechanism may retain the blades in a centered position when in their deployed position. Thus, such a retaining mechanism could act to retain the blades in a centered deployed position until one blade encounters a material harder than the other blade encounters, as described in detail above.” Ex. 1003, 7:55-8:2.⁹ Vandewater also discloses: “Biasing element 36 may comprise any suitable element or material for urging ball bearing 34 toward notch 24, such as, for example, a conventional spring-steel compression spring, or an elastomeric material such as rubber or the like. However, skilled artisans will recognize that other methods of urging ball bearing 34 toward notch 24 can be

⁹ Support for Vandewater’s disclosure is found in Provisional Patent Application No. 61/038,286 (Ex. 1004) at Paragraph No. [0021] and [0035], for example.

Claim 11 of ‘177 Patent	Vandewater
	utilized without departing from the principles of the present invention.” Ex. 1003, 3:63-66. ¹⁰ I include an annotated version of Figure 16 of Vandewater in Paragraph 103 below.

Claim 12 of ‘177 Patent	Vandewater
A broadhead in accordance with claim 11, wherein: the pivotal interconnection between the first blade member and the ferrule body and the pivotal interconnection between the second blade member and the ferrule body are substantially equidistant from the forward end of the ferrule.	As shown in Figure 16 in Vandewater, the pivotal interconnections between the first blade member and the ferrule body and between the second blade member and the ferrule body are substantially equidistant from the forward end of the ferrule. Ex. 1003, Fig. 16. ¹¹ I include an annotated version of Figure 16 of Vandewater in Paragraph 104 below.

Claim 15 of ‘177 Patent	Vandewater
A broadhead in accordance with claim 11, further comprising: a retaining element engaging the blade members to maintain the blade members in the retracted position.	Vandewater discloses: “ The retaining mechanism may retain the blades in their folded or aligned positions to provide a straighter flight . . . ” Ex. 1003, 7:62-64. ¹²

¹⁰ Support for Vandewater’s disclosure is found in Provisional Patent Application No. 61/038,286 (Ex. 1004) at Paragraph No. [0021] and [0035], for example.

¹¹ Support for Vandewater’s disclosure is found in Provisional Patent Application No. 61/038,286 (Ex. 1004) at Figures 7 and 8, for example.

¹² Support for Vandewater’s disclosure is found in Provisional Patent Application No. 61/038,286 (Ex. 1004) at Paragraph No. [0035], for example.

Claim 17 of ‘177 Patent	Vandewater
A broadhead in accordance with claim 11, wherein: the biasing member is a coil spring.	Vandewater discloses: “ Biasing element 36 may comprise any suitable element or material for urging ball bearing 34 toward notch 24, such as, for example, a conventional spring-steel compression spring, or an elastomeric material such as rubber or the like. However, skilled artisans will recognize that other methods of urging ball bearing 34 toward notch 24 can be utilized without departing from the principles of the present invention.” Ex. 1003, 3:63-66. ¹³

92. With regard to claims 11, 12, 15, and 17 of the ‘177 patent, as can be seen in the above chart, Vandewater discloses all the requirements of these claims. I further address these claims below.

CLAIM 11 – “A broadhead for an arrow having a shaft, the broadhead comprising:”

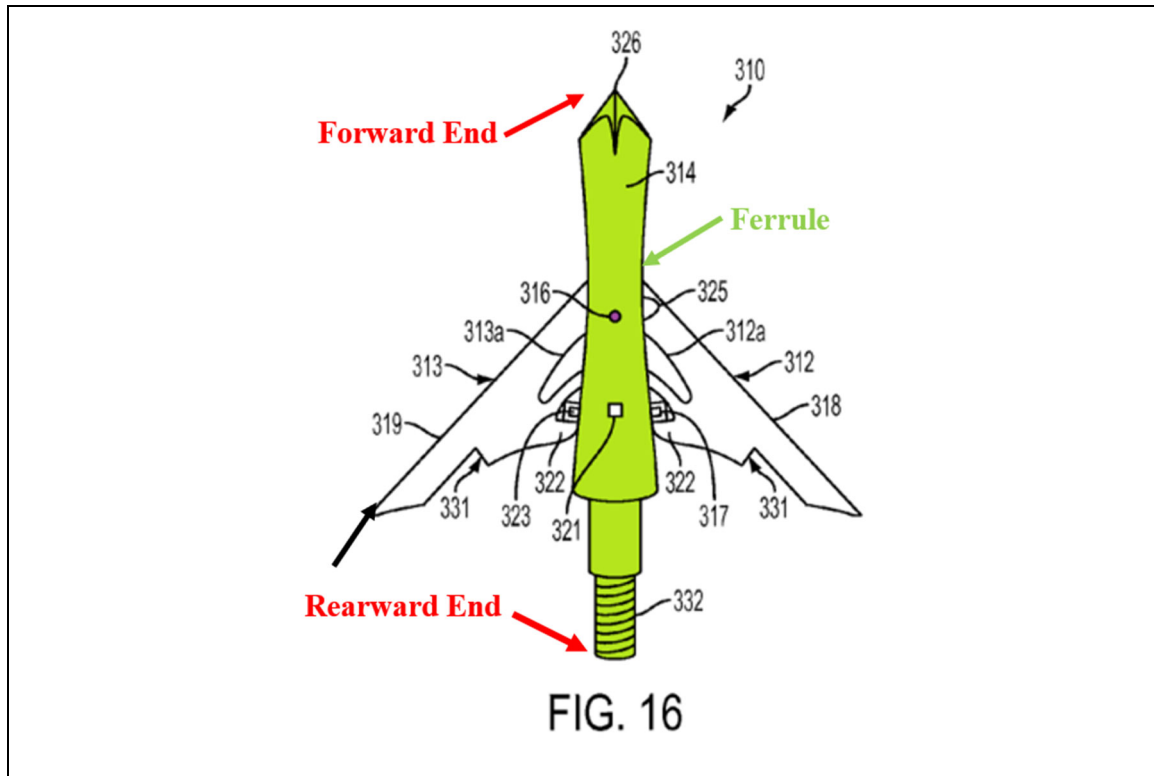
93. Vandewater discloses “pivotal arrowhead for an arrow” Ex. 1003, 1:33-34. Vandewater discloses that the arrowhead has a “body 14” and “may further include an externally threaded portion 32 for connection to an arrow shaft. In such a configuration, arrowhead 10 may be used as an arrowhead attached to a

¹³ Support for Vandewater’s disclosure is found in Provisional Patent Application No. 61/038,286 (Ex. 1004) at Paragraph No. [0021], for example.

conventional arrow shaft or bolt for use with a bow or crossbow. Optionally, it is envisioned that arrowhead 10 may be unitarily formed with or otherwise attached to a shaft of an arrow, while remaining within the spirit and scope of the present invention.” Ex. 1003, 3:29-36.

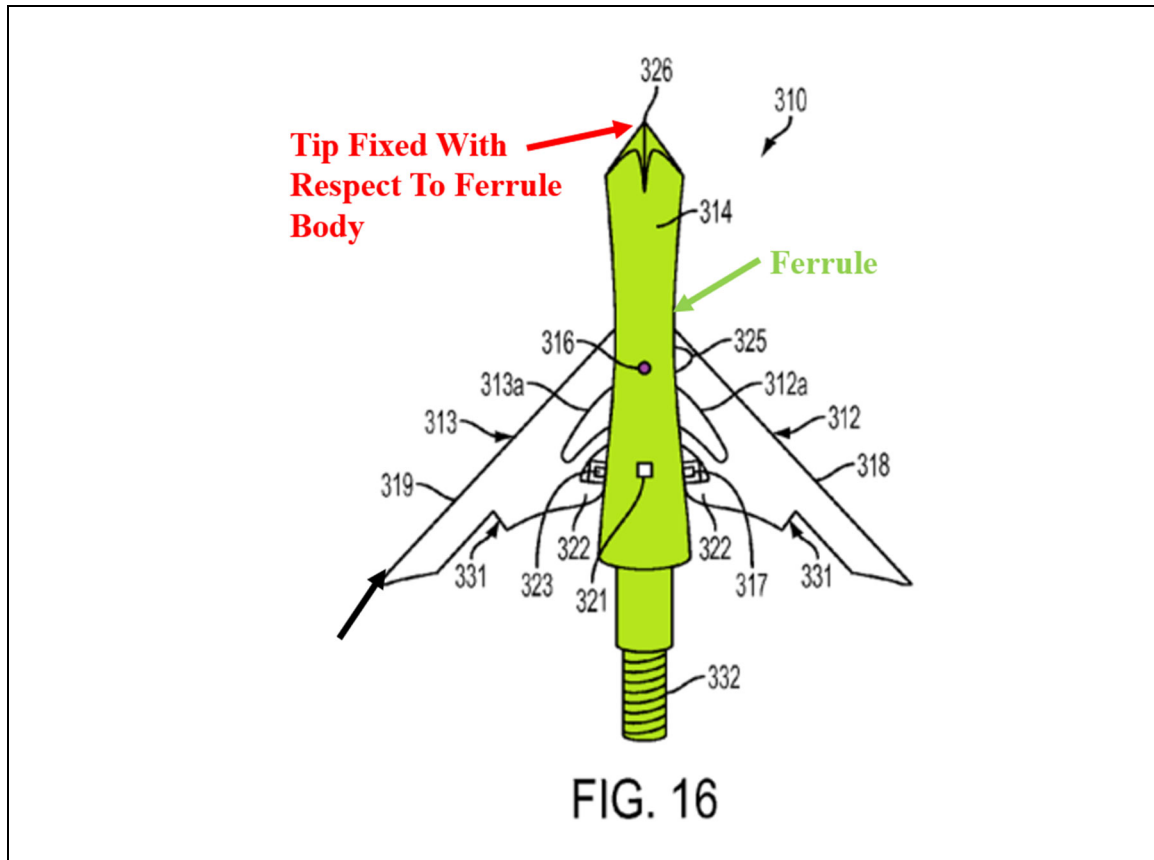
CLAIM 11 – “a ferrule having a rearward end configured for attachment to the shaft and an opposite forward end with a ferrule body extending therebetween,”

94. Vandewater discloses this requirement of claim 11. Vandewater discloses that “body 14 has an elongated shape, such as a cylindrical shape, and may have a substantially pointed portion or tip 26.” Ex. 1003, 3:13-15. Vandewater further discloses that body 14 “may further include an externally threaded portion 32 for connection to an arrow shaft.” Ex. 1003, 3:29-30. I include an annotated version of Figure 16 in Vandewater below.



CLAIM 11 – “the forward end of the ferrule defining the forward tip of the arrow and being fixed with respect to the ferrule body;”

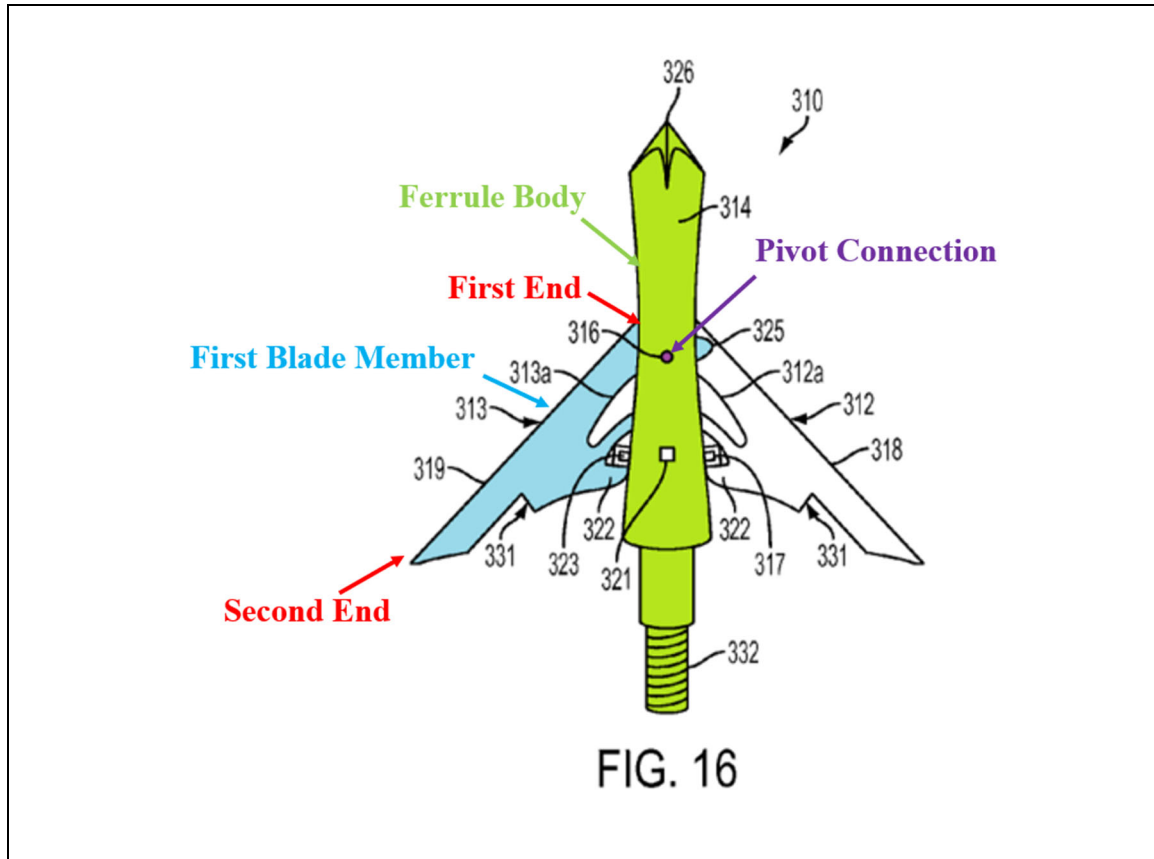
95. Vandewater discloses this requirement of claim 11. Vandewater discloses that a “body 14 has an elongated shape, such as a cylindrical shape, and may have a substantially pointed portion or tip 26.” Ex. 1003, 3:13-15. As shown in Figure 16 in Vandewater, for example, the forward tip is fixed with respect to the ferrule body. I include an annotated version of Figure 16 below.



CLAIM 11 – “a first blade member having a forward end pivotally interconnected with the ferrule body and an opposite rearward end,”

96. Vandewater discloses this requirement of claim 11. Vandewater discloses: “The pivot connection between blades 212 and 213 and body 214 allows the blades to fold or deploy and to pivot after deployment, and may be made with a set screw or other threaded connector or the like. Alternatively, the pivot connection may be established with an interference-fit pin, cotter pin, or other such device, as will be apparent to the skilled artisan.” Ex. 1003, 7:33-39; Figs. 7-11 and 15-20. Figures 7-11 and 15-20 in Vandewater, for example, disclose that the first blade

member has a forward end and an opposite rearward end. Ex. 1003, Fig. 16. I include an annotated version of Figure 16 below.

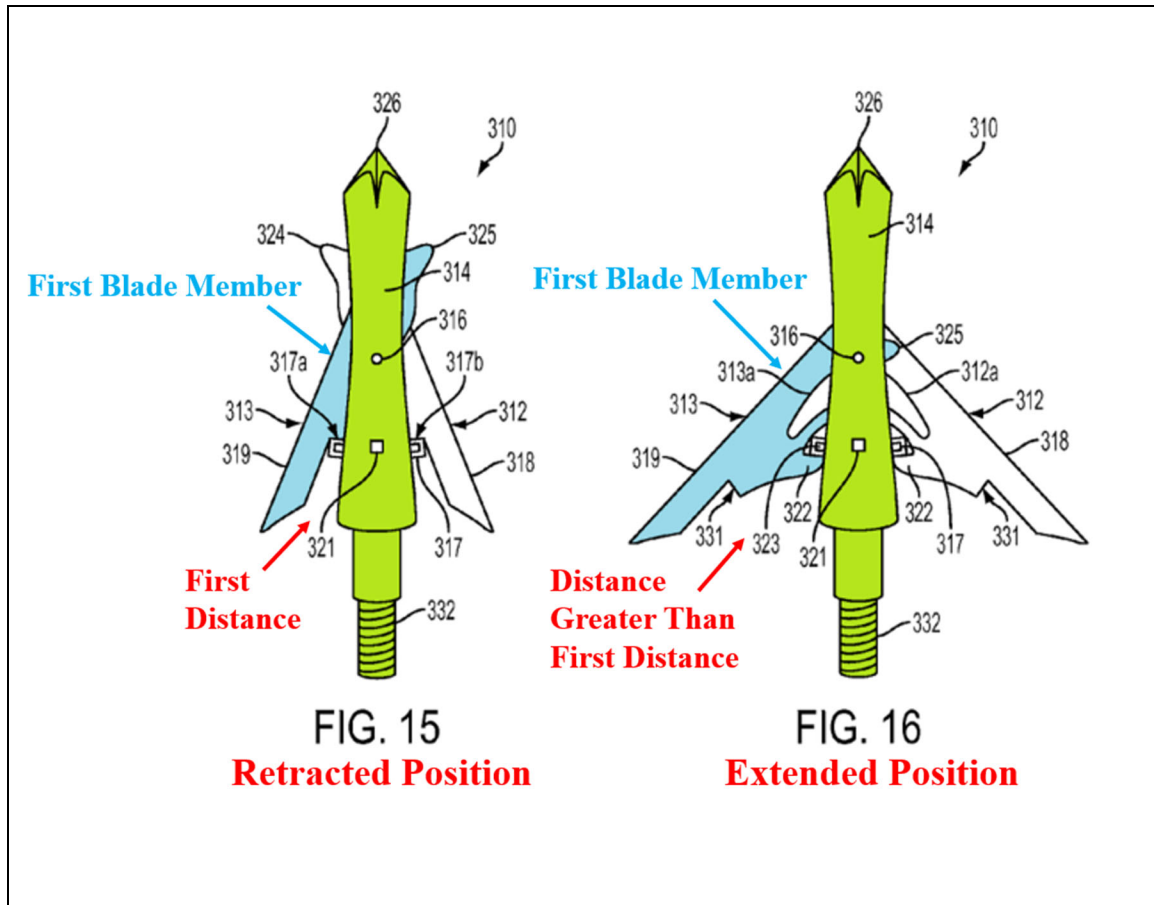


CLAIM 11 – “the first blade member having a retracted position wherein the rearward end is spaced from the ferrule body at a first distance and an extended position wherein the rearward end is spaced from the ferrule body by a distance which is greater than the first distance,”

97. Vandewater discloses this requirement of claim 11. Vandewater discloses: “Upon impact with an object such as an animal, first blade 212 and second blade 213, responding to forces exerted on first opening lever 224 and second opening lever 225, respectively, pivot to a deployed position (FIG. 8), thereby

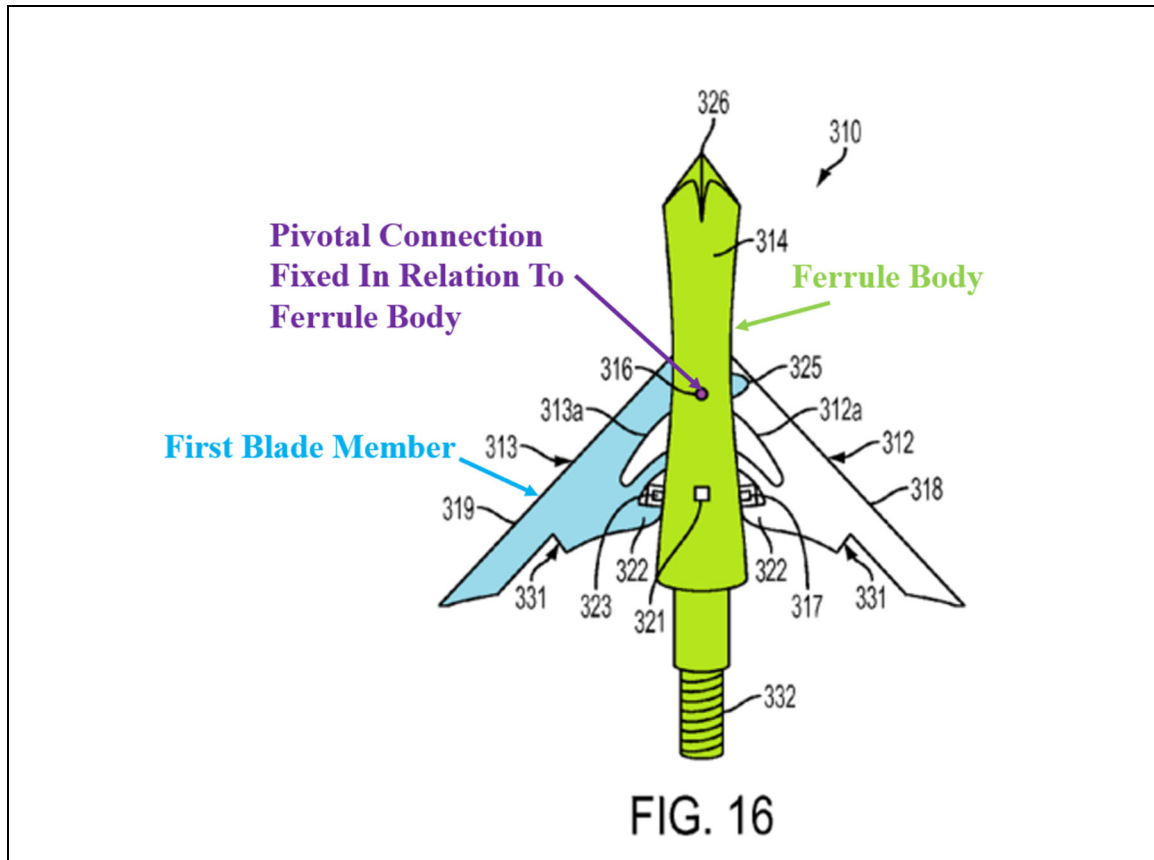
forming a broad cutting blade for promoting an increased rate of bleeding and a more humane kill. Further, when in the deployed position, the interlocked blades may pivot about pivot point 234 relative to the arrowhead body, such as in a similar manner as described above.” Ex. 1003, 7:45-54. See also Ex. 1003, 8:49-52 (“The similar components are referenced in FIGS. 7-12 and 15-20 with like reference numbers, but with the reference numbers of FIGS. 15-20 having 100 added thereto.”).

98. Figures 15 and 16 in Vandewater shows that the space between the first blade member and the ferrule body is greater when the first blade member is in an extended position. Ex. 1003, Figs. 15 and 16. I include annotated versions of Figures 15 and 16 below.



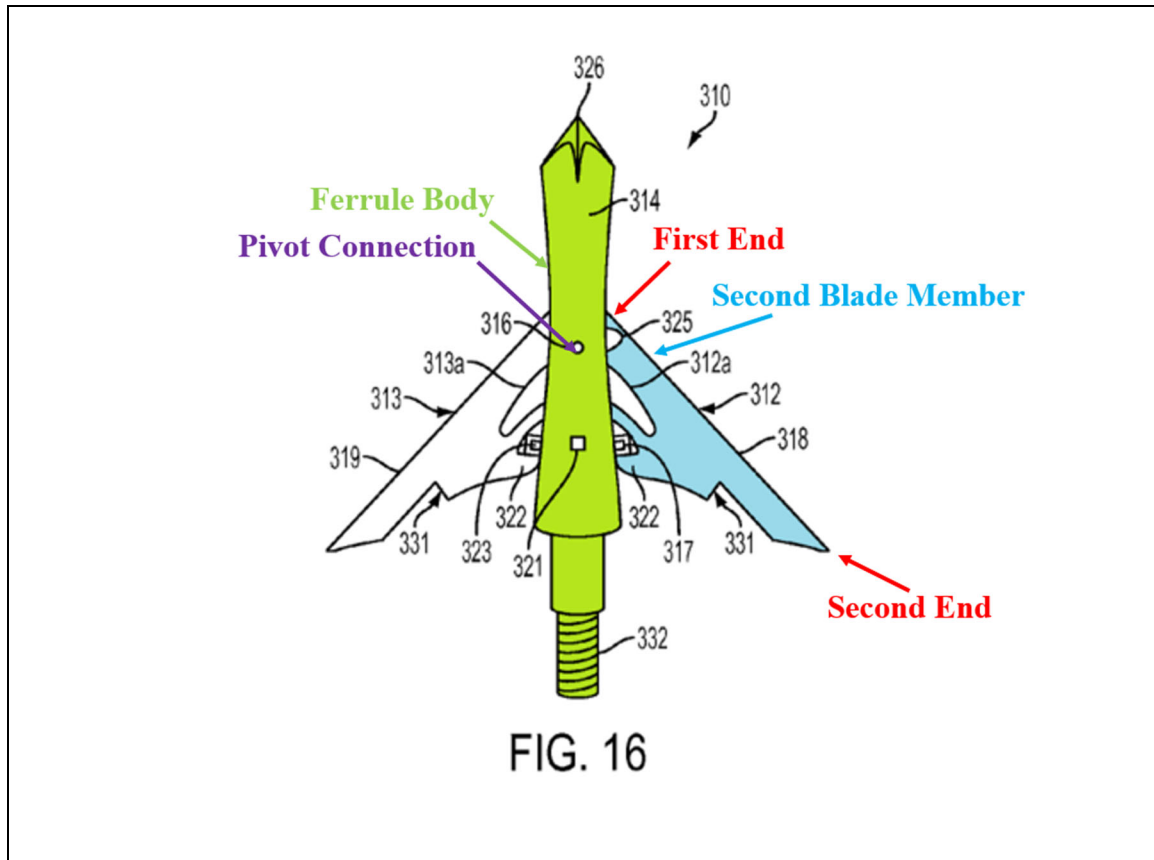
CLAIM 11 – “the pivotal interconnection between the first blade member and the ferrule body being at a fixed position relative to the ferrule body;”

99. Vandewater discloses this requirement of claim 11. Figure 16 in Vandewater, for example, discloses that the pivotal interconnection between the first blade member and the ferrule body is at a fixed position relative to the ferrule body. Ex. 1003, Figs. 7-11, 15-20. I include an annotated version of Figure 16 below.



CLAIM 11 – “a second blade member having a forward end pivotally interconnected with the ferrule body and an opposite rearward end,”

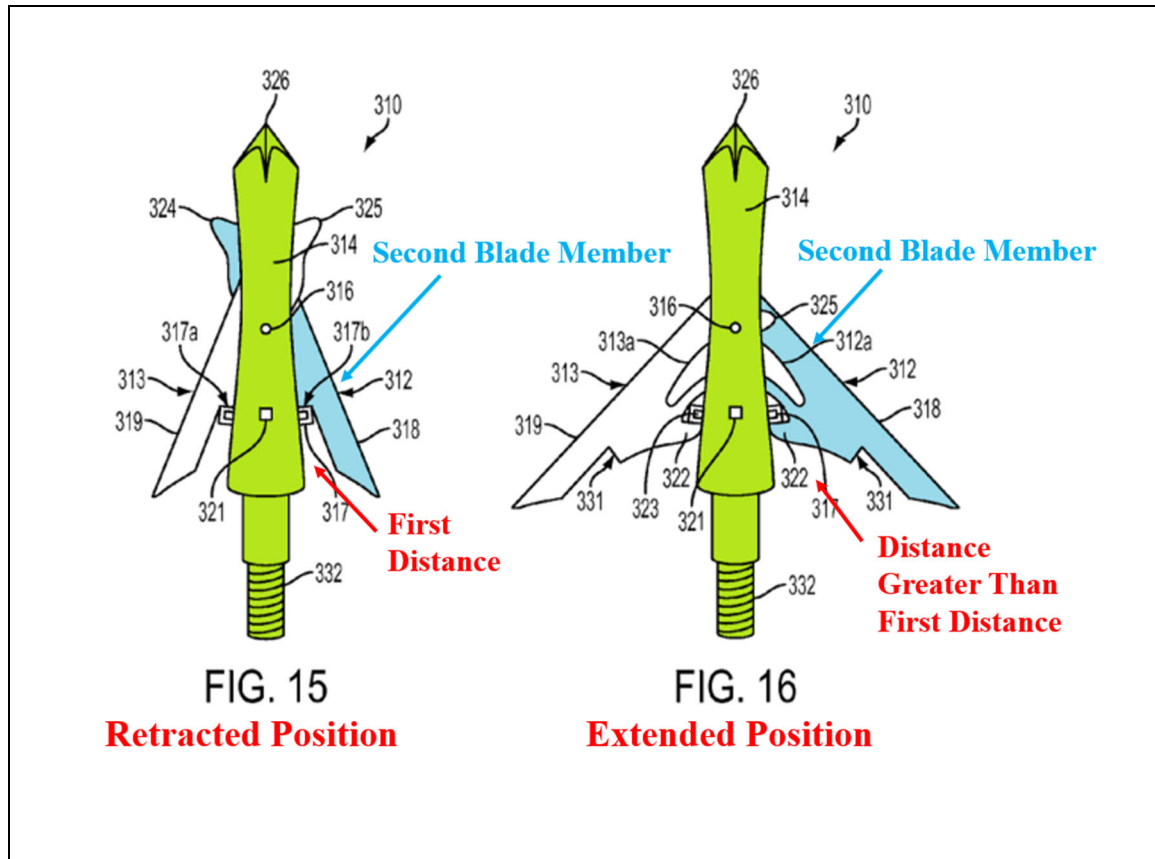
100. Vandewater discloses this requirement of claim 11. Vandewater discloses: “The pivot connection between blades 212 and 213 and body 214 allows the blades to fold or deploy and to pivot after deployment” Ex. 1003, 7:33-35; Figures 7-11 and 15-20 in Vandewater, for example, disclose that the second blade member has a forward end and an opposite rearward end. Ex. 1003, Figs. 7-11 and 15-20. I include an annotated version of Figure 16 below.



CLAIM 11 – “the second blade member having a retracted position wherein the rearward end is spaced from the ferrule body at a first distance and an extended position wherein the rearward end is spaced from the ferrule body by a distance which is greater than the first distance,”

101. Vandewater discloses this requirement of claim 11. Vandewater discloses: “The pivot connection between blades 212 and 213 and body 214 allows the blades to fold or deploy and to pivot after deployment, and may be made with a set screw or other threaded connector or the like. Alternatively, the pivot connection may be established with an interference-fit pin, cotter pin, or other such device, as will be apparent to the skilled artisan.” Ex. 1003, 7:33-39.

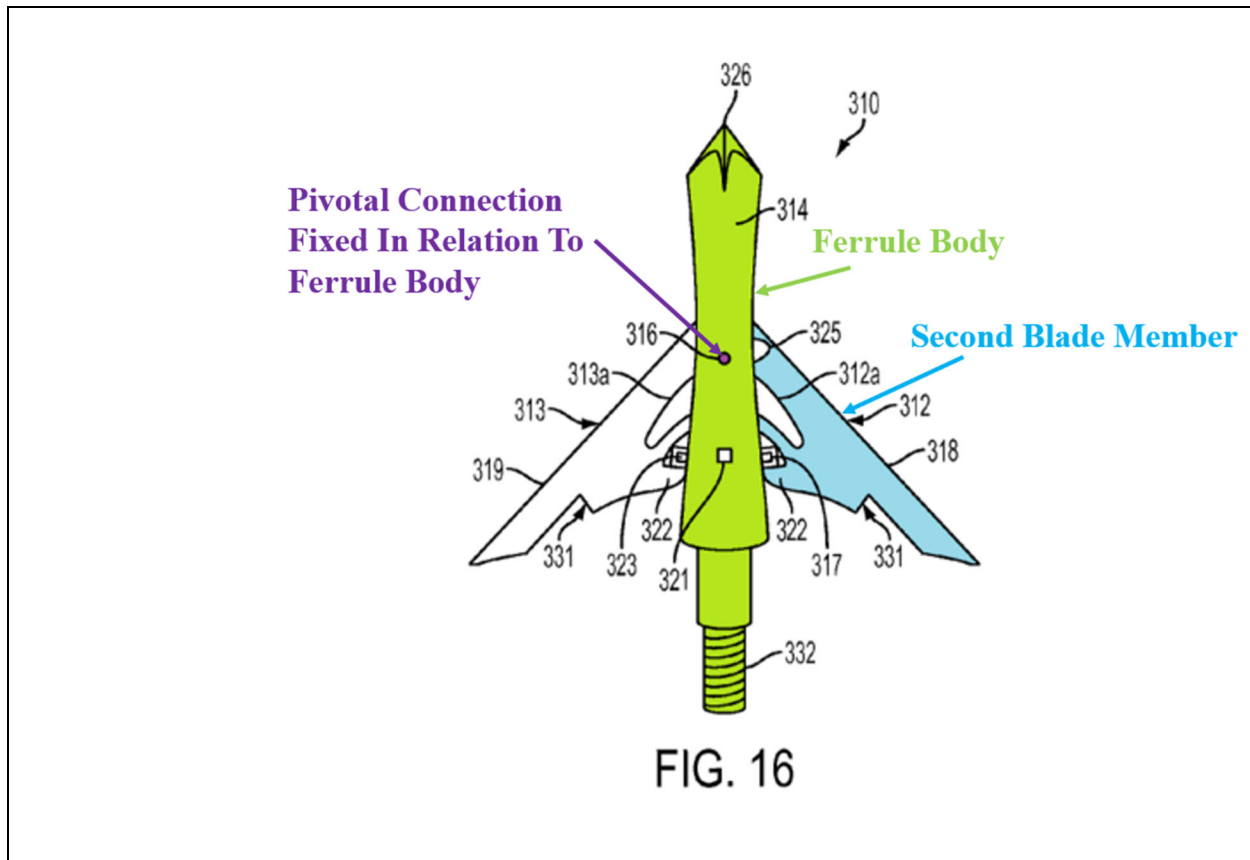
102. Figures 15 and 16 in Vandewater, for example, show that the space between the second blade member and the ferrule body is greater when the second blade member is in an extended position. Ex. 1003, Figs. 15 and 16. I include annotated versions of Figures 15 and 16 below.



CLAIM 11 – “the pivotal interconnection between the second blade member and the ferrule body being at a fixed position relative to the ferrule body; and”

103. Vandewater discloses this requirement of claim 11. Figures 7-11 and 15-20 in Vandewater, for example, disclose that the second blade member has a forward end and an opposite rearward end, and that the pivotal interconnection

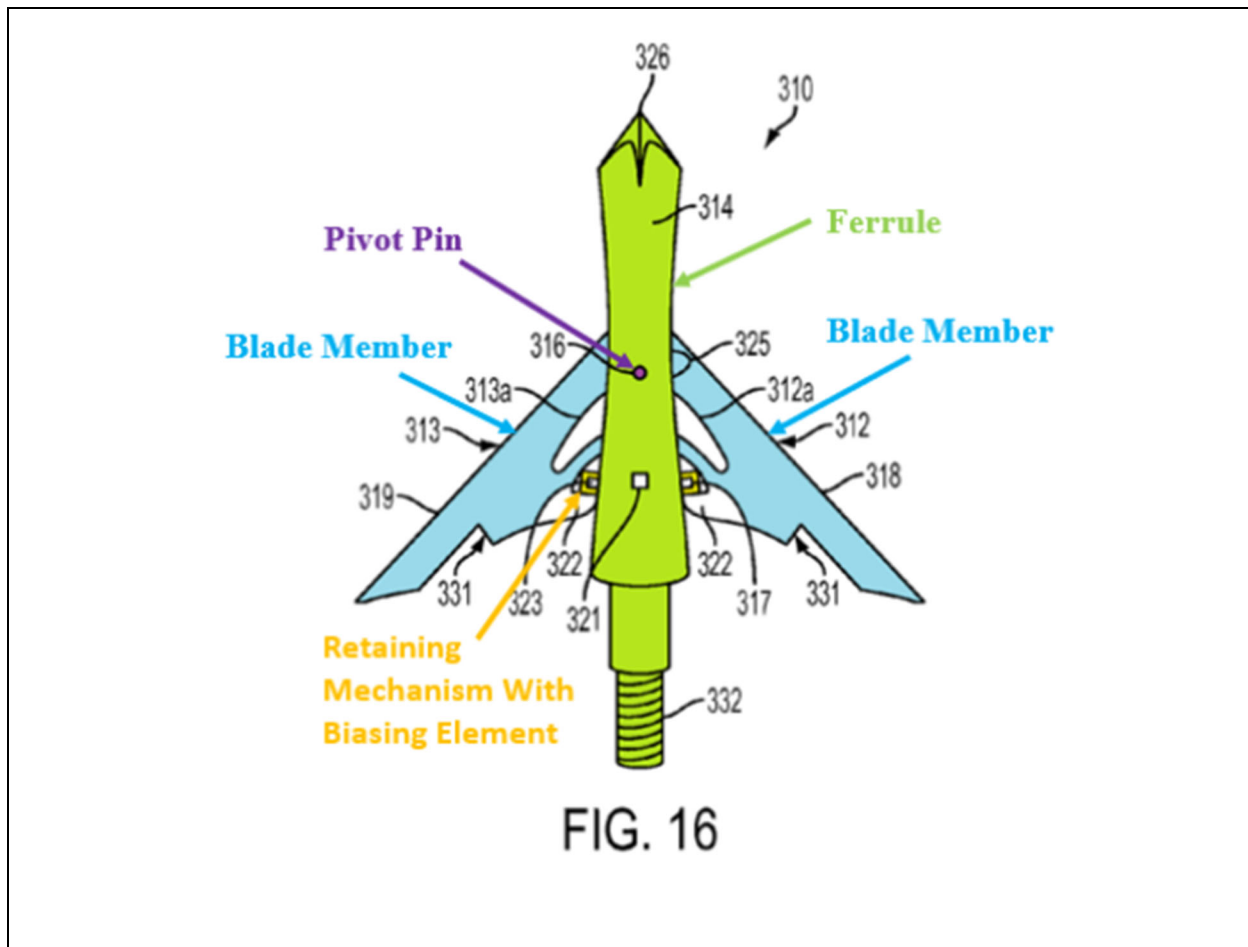
between the second blade member and the ferrule body is at a fixed position relative to the ferrule body. Ex. 1003, Figs. 7-11 and 15-20. I include an annotated version of Figure 16 below.



CLAIM 11 – “at least one biasing member biasing the first and second blade members towards the extended positions.”

104. Vandewater discloses this requirement of claim 11. Vandewater discloses: “Optionally, a retaining mechanism (not shown in FIGS. 7-12) may also be utilized with arrowhead 210, such as a biasing element with a ball bearing or a spring wheel in accordance with retaining mechanisms disclosed herein . . . the

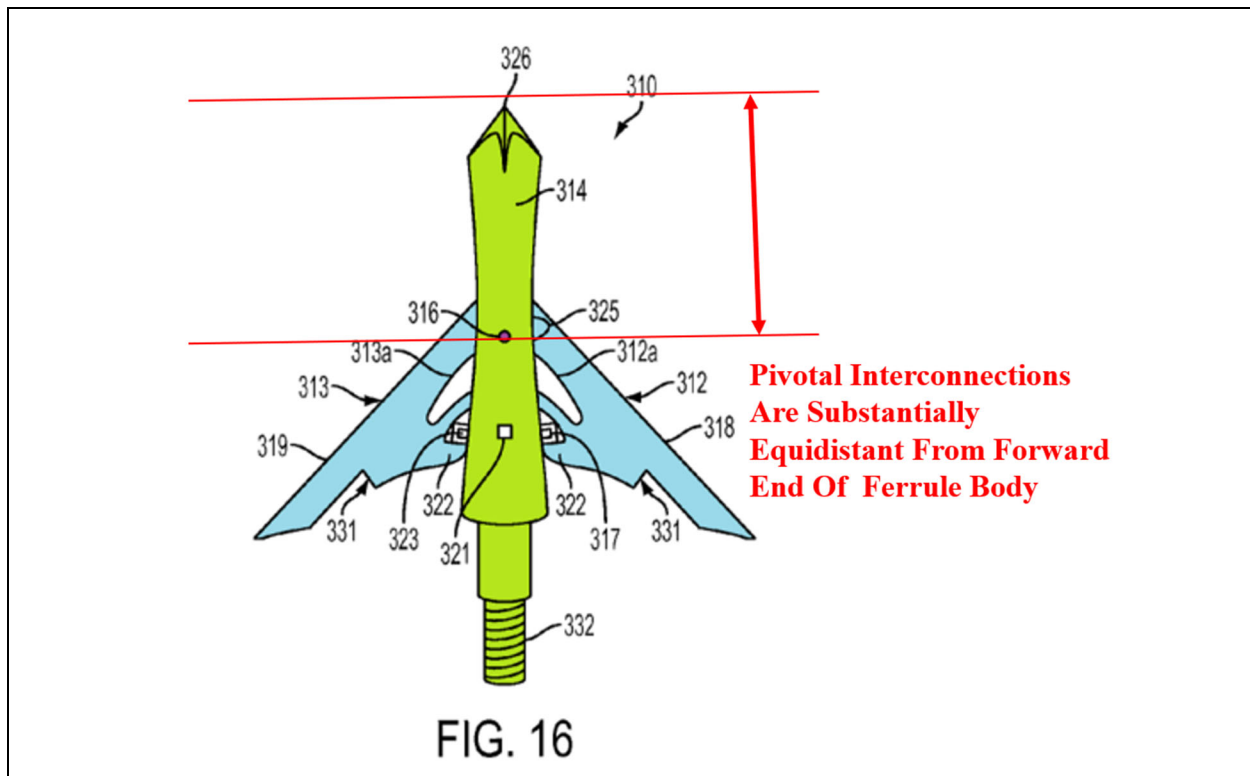
retaining mechanism may retain the blades in a centered position when in their deployed position. Thus, such a retaining mechanism could act to retain the blades in a centered deployed position until one blade encounters a material harder than the other blade encounters, as described in detail above.” Ex. 1003, 7:55-8:2. Vandewater also discloses: “Biasing element 36 may comprise any suitable element or material for urging ball bearing 34 toward notch 24, such as, for example, a conventional spring-steel compression spring, or an elastomeric material such as rubber or the like. However, skilled artisans will recognize that other methods of urging ball bearing 34 toward notch 24 can be utilized without departing from the principles of the present invention.” Ex. 1003, 3:63-66. I include an annotated version of Figure 16 below.



CLAIM 12 – “wherein: the pivotal interconnection between the first blade member and the ferrule body and the pivotal interconnection between the second blade member and the ferrule body are substantially equidistant from the forward end of the ferrule.”

105. Vandewater discloses this requirement of claim 12. As shown in Figures 7-11 and 15-20 in Vandewater, for example, the pivotal interconnections between the first blade member and the ferrule body and between the second blade member and the ferrule body are substantially equidistant from the forward end of

the ferrule. Ex. 1003, Figs. 7-11 and 15-20. An annotated version of Figure 16 is shown below.



CLAIM 15 – “a retaining element engaging the blade members to maintain the blade members in the retracted position.”

106. Vandewater discloses this requirement of claim 15. Vandewater discloses: “The retaining mechanism may retain the blades in their folded or aligned positions to provide a straighter flight” Ex. 1003, 7:62-64.

CLAIM 17 – “wherein: the biasing member is a coil spring.”

107. Vandewater discloses this requirement of claim 17. Vandewater discloses: “Biasing element 36 may comprise any suitable element or material for

urging ball bearing 34 toward notch 24, such as, for example, a conventional spring-steel compression spring, or an elastomeric material such as rubber or the like. However, skilled artisans will recognize that other methods of urging ball bearing 34 toward notch 24 can be utilized without departing from the principles of the present invention.” Ex. 1003, 3:63-66.

C. Ground III: Lint Alone or in Combination With Minisini and/or Krieger Disclose Every Limitation of Claims 1-4, 7, 9, 11, 12, 15, and 17

108. I have compared claims 1-4, 7, 9, 11, 12, 15, and 17 to Lint, Minisini, and Krieger. It is my opinion that the Lint alone or Lint in further view of Minisini, and/or Krieger discloses each and every limitation of claims 1-4, 7, 9, 11, 12, 15, and 17. Below, I address each claim limitation.

Claim 1 of ‘177 Patent	Lint, Minisini, and Krieger
A broadhead for an arrow having a shaft, the broadhead comprising:	Lint discloses an “arrowhead” that “includes a forward or pointed tip portion 11 and a body portion 12 . . . The body 12 is of a generally tubular shape and is provided with a bore 14 which is internally threaded as indicated at 15. The threads 15 of the bore 14 engage with threads 16 provided upon one end of an arrow shaft 17.” Ex. 1002, 2:29-38.
a ferrule having a rearward end configured for attachment to the shaft and an opposite forward end with a ferrule body extending therebetween;	Lint discloses that “the arrowhead of the present invention indicated generally at 10 includes a forward or pointed tip portion 11 and a body portion 12. The tip portion 11 may be

Claim 1 of '177 Patent	Lint, Minisini, and Krieger
	removably attached to the body portion 12, as indicated at 13 in FIGURES 2 and 3, or the tip may be integrally secured to the body 12. The body 12 is of a generally tubular shape and is provided with a bore 14 which is internally threaded as indicated at 15. The threads 15 of the bore 14 engage with threads 16 provided upon one end of an arrow shaft 17.” Ex. 1002, 2:29-38 and Fig. 1.
a first blade member having a first end pivotally interconnected with the ferrule body and an opposite second end,	Lint discloses: “The tubular body 12 of the arrowhead 10 is provided with two longitudinally extending slots or depressions 18 which are oppositely disposed at either side of the body 12. A barb 19 is contained in each of the slots 18 and is pivoted to the tubular body 12 by means of a pivot pin 20.” Ex. 1002, 2:39-45 and Fig. 2. As explained in Paragraphs 112-118 below, in my opinion, the plain and ordinary language of the claim does not require that the “first blade member” contain a sharp edge because there is no express language in the claims for such a requirement. Also, in my opinion, there is no disclosure in the specification or prosecution history that would restrict or otherwise require that the “first blade member” contain a sharp edge. However, it would have been obvious to a PHOSITA to simply to add a sharp edge to the first blade member

Claim 1 of '177 Patent	Lint, Minisini, and Krieger
	disclosed in Lint because a PHOSITA would know that sharp edges facilitate expeditious cutting of flesh, expedited hemorrhaging which ultimately leads to humane discharge of game animals while greatly enhancing the aerodynamic flight characteristics of broadheads. Such practices date back some 15,700 years, when the earliest of ancient arrowheads have been documented in primitive fishing and hunting activities. An exemplar of an ancient fish point (a.k.a., an arrowhead) is shown in Ex. 1014. Minisini is directed toward “arrows and more particularly to an arrow especially designed for shooting fish, but which is adaptable for other uses.” Ex. 1005, 1: 15-17. Minisini discloses an “arrowhead H includes a ferrule 12 having an internal socket 13 into which is fitted the forward end of the arrow shaft.” Ex. 1005, 2:10-12. The ferrule contains a barb with “its forward end rockably mounted on a pivot pin 21” Ex. 1005, 2:27-29. Minisini discloses that the “barb preferably has its outer longitudinal edge sharpened to cut through a fish” Ex. 1005, 2:31-34. Krieger is directed to “arrows and more particularly to arrowheads.” Ex. 1006, 1:1-2. Krieger discloses that “[t]o reduce air friction the longitudinal edges of the wings or blades are

Claim 1 of '177 Patent	Lint, Minisini, and Krieger
	sharpened to knife edges.” Ex. 1006, at 2:10-12.
the first blade member having a retracted position wherein the second end is spaced from the ferrule body at a first distance and an extended position wherein the second end is spaced from the ferrule body by a distance which is greater than the first distance;	Lint discloses: “Each of said barbs 19 includes an outer barb portion 21 which projects outwardly and rearwardly of the arrowhead body 12 when the barbs 19 are in the open position as illustrated by FIGURE 2.” Ex. 1002, 2:45-48 and Fig. 2. Lint discloses “when the arrowhead 10 penetrates the flesh of an animal, the initial impact on the outer portions 21 of the barbs 19 causes the barbs to be retracted into the slots 18 against the bias of the spring 24.” Ex. 1002, 2:64-67. Figures 2 and 3 of Lint shows that the space between the first blade member and the ferrule body is greater when the first blade member is in an extended position. Ex. 1002, Figs. 2 and 3. I include annotated versions of Figures 2 and 3 above in Paragraph 68.
a second blade member having a first end pivotally interconnected with the ferrule body and an opposite second end	Lint discloses: “The tubular body 12 of the arrowhead 10 is provided with two longitudinally extending slots or depressions 18 which are oppositely disposed at either side of the body 12. A barb 19 is contained in each of the slots 18 and is pivoted to the tubular body 12 by means of a pivot pin 20.” Ex. 1002, 2:39-45 and Fig. 2. As explained in Paragraph 121-127 below, in my opinion, the plain and

Claim 1 of '177 Patent	Lint, Minisini, and Krieger
	ordinary language of the claim does not require that the “second blade member” contain a sharp edge because there is no express language in the claims for such a requirement. Also, in my opinion, there is no disclosure in the specification or prosecution history that would restrict or otherwise require that the “second blade member” contain a sharp edge. However, it would have been obvious to a PHOSITA to simply to add a sharp edge to the second blade member disclosed in Lint because a PHOSITA would know that sharp edges facilitate expeditious cutting of flesh, expedited hemorrhaging which ultimately leads to humane discharge of game animals while greatly enhancing the aerodynamic flight characteristics of broadheads. Such practices date back some 15,700 years, when the earliest of ancient arrowheads have been documented in primitive fishing and hunting activities. Minisini is directed toward “arrows and more particularly to an arrow especially designed for shooting fish, but which is adaptable for other uses.” Ex. 1005, 1: 15-17. Minisini discloses an “arrowhead H includes a ferrule 12 having an internal socket 13 into which is fitted the forward end of the arrow shaft.” Ex. 1005, 2:10-12. The ferrule contains a barb with “its forward end rockably mounted on a pivot pin 21 . . .

Claim 1 of '177 Patent	Lint, Minisini, and Krieger
	.” Ex. 1005, 2:27-29. Minisini discloses that the “barb preferably has its outer longitudinal edge sharpened to cut through a fish” Ex. 1005, 2:31-34. Krieger is directed to “arrows and more particularly to arrowheads.” Ex. 1006, 1:1-2. Krieger discloses that “[t]o reduce air friction the longitudinal edges of the wings or blades are sharpened to knife edges.” Ex. 1006, at 2:10-12.
the [second] blade member having a retracted position wherein the second end is spaced from the ferrule body at a first distance and an extended position wherein the second end is spaced from the ferrule body by a distance which is greater than the first distance; and	Lint discloses: “Each of said barbs 19 includes an outer barb portion 21 which projects outwardly and rearwardly of the arrowhead body 12 when the barbs 19 are in the open position as illustrated by FIGURE 2.” Ex. 1002, 2:45-48 and Fig. 2. Lint discloses “when the arrowhead 10 penetrates the flesh of an animal, the initial impact on the outer portions 21 of the barbs 19 causes the barbs to be retracted into the slots 18 against the bias of the spring 24.” (Ex. 1002, 2:64-67. Figures 2 and 3 of Lint shows that the space between the second blade member and the ferrule body is greater when the second blade member is in an extended position. Ex. 1002, Figs. 2 and 3. I include annotated versions of Figures 2 and 3 above in Paragraph 70.

Claim 1 of '177 Patent	Lint, Minisini, and Krieger
at least one biasing member biasing the first and second blade members towards the extended positions, the biasing member being the only element operable to hold the blade members in the extended position.	Lint discloses: “A spring 24 is provided within the bore 14 of the body 12 and extends between the tip portion 11 of the arrowhead 10 and the forward surface of the transversely extending inner barb portions 22. This spring operates to bias the barbs 19 in the open position illustrated by FIGURE 2.” Ex. 1002, 2:53-58 and Fig. 2. As shown in Figure 2 in Lint, the spring is the only element operable to hold the blade members in the extended position. I include an annotated version of Figure 2 above in Paragraph 71.

Claim 2 of the '177 Patent	Lint, Minisini, and Krieger
A broadhead in accordance with claim 1, wherein: the pivotal interconnection between the first blade member and the ferrule body is at a fixed position relative to the ferrule body; and the pivotal interconnection between the second blade member and the ferrule body being at a fixed position relative to the ferrule body.	As shown in Figures 2 and 3 of Lint, the pivotal interconnections between the first blade member and the ferrule body and between the second blade member and the ferrule body are fixed position relative to the ferrule body. Ex. 1002, Figs. 2 and 3. I include an annotated version of Figure 2 above in Paragraph 72.

Claim 3 of '177 Patent	Lint, Minisini, and Krieger
A broadhead in accordance with claim 2, wherein: the pivotal interconnection between the first blade member and the ferrule body and the pivotal	As shown in Figure 2 of Lint, the pivotal interconnections between the first blade member and the ferrule body and between the second blade

Claim 3 of '177 Patent	Lint, Minisini, and Krieger
interconnection between the second blade member and the ferrule body are substantially equidistant from the forward end of the ferrule.	member and the ferrule body are substantially equidistant from the forward end of the ferrule. Ex. 1002, Fig. 2. I include an annotated version of Figure 2 above in Paragraph 73.

Claim 4 of '177 Patent	Lint, Minisini, and Krieger
A broadhead in accordance with claim 1, wherein: the first ends of the first and second blade members are forward ends and the second ends are rearward ends.	Lint discloses: “ A barb 19 is contained in each of the slots 18 and is pivoted to the tubular body 12 by means of a pivot pin 20. Each of said barbs 19 includes an outer barb portion 21 which projects outwardly and rearwardly of the arrowhead body 12 when the barbs 19 are in the open position as illustrated by FIGURE 2. Outer barb portions 21 extend angularly from the inner barb ends 22 which project through the forward portions 23 of the slots 18 into the bore 14 of the tubular body 12. ” Ex. 1002, 2:42-50. I include an annotated version of Figure 2 above in Paragraph 74.

Claim 7 of '177 Patent	Lint, Minisini, and Krieger
A broadhead in accordance with claim 1, further comprising: a retaining element engaging the blade members to maintain the blade members in the retracted position.	Lint discloses: “ To remove the arrowhead from the animal, the barbs may be again retracted by threading the shaft 17 into the bore 14 until the shaft contacts the outer surfaces of the inner barb portions 22. When this contact occurs, further inward threading of the shaft within

Claim 7 of '177 Patent	Lint, Minisini, and Krieger
	the bore 14 will cause the barbs 19 to be retracted within the slots 18, as illustrated by FIGURE 3.” Ex. 2:70-3:4. I include an annotated version of Figure 3 above in Paragraph 75.

Claim 9 of '177 Patent	Lint, Minisini, and Krieger
A broadhead in accordance with claim 1, wherein: the biasing member is a coil spring.	Lint discloses: “ A spring 24 is provided within the bore 14 of the body 12 and extends between the tip portion 11 of the arrowhead 10 and the forward surface of the transversely extending inner barb portions 22. This spring operates to bias the barbs 19 in the open position illustrated by FIGURE 2.” Ex. 1002, 2:53-58 and Fig. 2. I include an annotated version of Figure 2 above in Paragraph 71.

Claim 11 of '177 Patent	Lint, Minisini, and Krieger
A broadhead for an arrow having a shaft, the broadhead comprising:	To the extent the preamble is limiting, Lint discloses an “ arrowhead ” that “ includes a forward or pointed tip portion 11 and a body portion 12 . . . The body 12 is of a generally tubular shape and is provided with a bore 14 which is internally threaded as indicated at 15. The threads 15 of the bore 14 engage with threads 16 provided upon one end of an arrow shaft 17.” Ex. 1002, 2:29-38.
a ferrule having a rearward end configured for attachment to the shaft	Lint discloses that “ the arrowhead of the present invention indicated generally at 10 includes a forward or

Claim 11 of '177 Patent	Lint, Minisini, and Krieger
and an opposite forward end with a ferrule body extending therebetween,	pointed tip portion 11 and a body portion 12. The tip portion 11 may be removably attached to the body portion 12, as indicated at 13 in FIGURES 2 and 3, or the tip may be integrally secured to the body 12. The body 12 is of a generally tubular shape and is provided with a bore 14 which is internally threaded as indicated at 15. The threads 15 of the bore 14 engage with threads 16 provided upon one end of an arrow shaft 17.” Ex. 1002, 2:29-38 and Fig. 1. I include an annotated version of Figure 2 of Lint is shown above in Paragraph 67.
the forward end of the ferrule defining the forward tip of the arrow and being fixed with respect to the ferrule body;	Lint discloses: “[T]he arrowhead of the present invention indicated generally at 10 includes a forward or pointed tip portion 11 and a body portion 12. The tip portion 11 may be removably attached to the body portion 12, as indicated at 13 in FIGURES 2 and 3, or the tip may be integrally secured to the body 12.” Ex. 1002, 2:29-34.
a first blade member having a forward end pivotally interconnected with the ferrule body and an opposite rearward end,	Lint discloses: “A barb 19 is contained in each of the slots 18 and is pivoted to the tubular body 12 by means of a pivot pin 20.” Ex. 1002, 2:43-45 and Fig. 2. I include an annotated version of Figure 2 above in Paragraph 68. As explained in Paragraphs 138-145, in my opinion, the plain and ordinary language of the claim does not require

Claim 11 of '177 Patent	Lint, Minisini, and Krieger
	that the “first blade member” contain a sharp edge because there is no express language in the claims for such a requirement. Also, in my opinion, there is no disclosure in the specification or prosecution history that would restrict or otherwise require that the “first blade member” contain a sharp edge. However, it would have been obvious to a PHOSITA to simply to add a sharp edge to the first blade member disclosed in Lint because a PHOSITA would know that sharp edges facilitate expeditious cutting of flesh, expedited hemorrhaging which ultimately leads to humane discharge of game animals while greatly enhancing the aerodynamic flight characteristics of broadheads. Such practices date back some 15,700 years, when the earliest of ancient arrowheads have been documented in primitive fishing and hunting activities. Minisini is directed toward “arrows and more particularly to an arrow especially designed for shooting fish, but which is adaptable for other uses.” Ex. 1005, 1: 15-17. Minisini discloses an “arrowhead H includes a ferrule 12 having an internal socket 13 into which is fitted the forward end of the arrow shaft.” Ex. 1005, 2:10-12. The ferrule contains a barb with “its forward end rockably mounted on a pivot pin 21” Ex. 1005, 2:27-29. Minisini discloses that the “barb preferably has its outer

Claim 11 of '177 Patent	Lint, Minisini, and Krieger
	longitudinal edge sharpened to cut through a fish" Ex. 1005, 2:31-34. Krieger is directed to "arrows and more particularly to arrowheads." Ex. 1006, 1:1-2. Krieger discloses that "[t]o reduce air friction the longitudinal edges of the wings or blades are sharpened to knife edges." Ex. 1006, at 2:10-12.
the first blade member having a retracted position wherein the rearward end is spaced from the ferrule body at a first distance and an extended position wherein the rearward end is spaced from the ferrule body by a distance which is greater than the first distance,	Lint discloses: "Each of said barbs 19 includes an outer barb portion 21 which projects outwardly and rearwardly of the arrowhead body 12 when the barbs 19 are in the open position as illustrated by FIGURE 2." Ex. 1002, 2:45-48 and Fig. 2. Figures 2 and 3 of Lint show that the space between the first blade member and the ferrule body is greater when the first blade member is in an extended position. Ex. 1002, Figs. 2 and 3. I include annotated versions of Figures 2 and 3 above in Paragraph 69.
the pivotal interconnection between the first blade member and the ferrule body being at a fixed position relative to the ferrule body;	Lint discloses: "A barb 19 is contained in each of the slots 18 and is pivoted to the tubular body 12 by means of a pivot pin 20." Ex. 1002, 2:43-45 and Fig. 2. Figures 2 and 3 disclose that the pivotal interconnection between the

Claim 11 of '177 Patent	Lint, Minisini, and Krieger
	first blade member and the ferrule body is at a fixed position relative to the ferrule body. I include annotated version of Figure 2 in Paragraph 73.
a second blade member having a forward end pivotally interconnected with the ferrule body and an opposite rearward end,	Lint discloses: “A barb 19 is contained in each of the slots 18 and is pivoted to the tubular body 12 by means of a pivot pin 20.” Ex. 1002, 2:43-45 and Fig. 2. I include an annotated version of Figure 2 above in Paragraph 70. As explained in Paragraphs 149-154, in my opinion, the plain and ordinary language of the claim does not require that the “second blade member” contain a sharp edge because there is no express language in the claims for such a requirement. Also, in my opinion, there is no disclosure in the specification or prosecution history that would restrict or otherwise require that the “second blade member” contain a sharp edge. However, it would have been obvious to a PHOSITA to simply to add a sharp edge to the second blade member disclosed in Lint because a PHOSITA would know that sharp edges facilitate expeditious cutting of flesh, expedited hemorrhaging which ultimately leads to humane discharge of game animals while greatly enhancing the aerodynamic flight characteristics of broadheads. Such practices date back some 15,700 years, when the earliest of

Claim 11 of '177 Patent	Lint, Minisini, and Krieger
	ancient arrowheads have been documented in primitive fishing and hunting activities. Minisini is directed toward “arrows and more particularly to an arrow especially designed for shooting fish, but which is adaptable for other uses.” Ex. 1005, 1: 15-17. Minisini discloses an “arrowhead H includes a ferrule 12 having an internal socket 13 into which is fitted the forward end of the arrow shaft.” Ex. 1005, 2:10-12. The ferrule contains a barb with “its forward end rockably mounted on a pivot pin 21” Ex. 1005, 2:27-29. Minisini discloses that the “barb preferably has its outer longitudinal edge sharpened to cut through a fish” Ex. 1005, 2:31-34. Krieger is directed to “arrows and more particularly to arrowheads.” Ex. 1006, 1:1-2. Krieger discloses that “[t]o reduce air friction the longitudinal edges of the wings or blades are sharpened to knife edges.” Ex. 1006, at 2:10-12.
the second blade member having a retracted position wherein the rearward end is spaced from the ferrule body at a first distance and an extended position wherein the rearward end is spaced from the ferrule body by a distance which is greater than the first distance,	Lint discloses: “Each of said barbs 19 includes an outer barb portion 21 which projects outwardly and rearwardly of the arrowhead body 12 when the barbs 19 are in the open position as illustrated by FIGURE 2.” Ex. 1002, 2:45-48 and Fig. 2.

Claim 11 of '177 Patent	Lint, Minisini, and Krieger
	Figures 2 and 3 of Lint show that the space between the second blade member and the ferrule body is greater when the second blade member is in an extended position. Ex. 1002, Figs. 2 and 3. I include annotated versions of Figures 2 and 3 above in Paragraph 71.
the pivotal interconnection between the second blade member and the ferrule body being at a fixed position relative to the ferrule body; and	Lint discloses: “A barb 19 is contained in each of the slots 18 and is pivoted to the tubular body 12 by means of a pivot pin 20.” Ex. 1002, 2:43-45 and Fig. 2. Figures 2 and 3 disclose that the pivotal interconnection between the second blade member and the ferrule body is at a fixed position relative to the ferrule body. I include an annotated version of Figure 2 above in Paragraph 73.
at least one biasing member biasing the first and second blade members towards the extended positions.	Lint discloses: “A spring 24 is provided within the bore 14 of the body 12 and extends between the tip portion 11 of the arrowhead 10 and the forward surface of the transversely extending inner barb portions 22. This spring operates to bias the barbs 19 in the open position illustrated by FIGURE 2.” Ex. 1002, 2:53-58 and Fig. 2. I include an annotated version of Figure 2 above in Paragraph 72.

Claim 12 of '177 Patent	Lint, Minisini, and Krieger
A broadhead in accordance with claim 11, wherein: the pivotal interconnection between the first blade member and the ferrule body and the pivotal interconnection between the second blade member and the ferrule body are substantially equidistant from the forward end of the ferrule.	As shown in Figure 2 in Lint, the pivotal interconnections between the first blade member and the ferrule body and between the second blade member and the ferrule body are substantially equidistant from the forward end of the ferrule. Ex. 1002, Fig. 2. I include an annotated version of Figure 2 above in Paragraph 74.

Claim 15 of '177 Patent	Lint, Minisini, and Krieger
A broadhead in accordance with claim 11, a retaining element engaging the blade members to maintain the blade members in the retracted position.	Lint discloses: “To remove the arrowhead from the animal, the barbs may be again retracted by threading the shaft 17 into the bore 14 until the shaft contacts the outer surfaces of the inner barb portions 22. When this contact occurs, further inward threading of the shaft within the bore 14 will cause the barbs 19 to be retracted within the slots 18, as illustrated by FIGURE 3. ” Ex. 1002, 2:70-3:4. I include an annotated version of Figure 3 above in Paragraph 76.

Claim 17 of '177 Patent	Lint, Minisini, and Krieger
A broadhead in accordance with claim 11, wherein: the biasing member is a coil spring.	Lint discloses: “ A spring 24 is provided within the bore 14 of the body 12 and extends between the tip portion 11 of the arrowhead 10 and the forward surface of the transversely extending inner barb portions 22. This spring operates to bias the barbs 19 in the open position illustrated by

Claim 17 of '177 Patent	Lint, Minisini, and Krieger
	FIGURE 2.” Ex. 1002, 2:53-58 and Fig. 2.

109. With regard to claims 1-4, 7, 9, 11, 12, 15, and 17 of the '177 patent, as can be seen in the above chart, Lint alone or in combination with Minisini and Krieger discloses all the requirements of these claims. I further address these claims below.

CLAIM 1 – “A broadhead for an arrow having a shaft, the broadhead comprising:”

110. Lint discloses an “arrowhead” that “includes a forward or pointed tip portion 11 and a body portion 12 . . . The body 12 is of a generally tubular shape and is provided with a bore 14 which is internally threaded as indicated at 15. The threads 15 of the bore 14 engage with threads 16 provided upon one end of an arrow shaft 17.” Ex. 1002, 2:29-38.

CLAIM 1 – “a ferrule having a rearward end configured for attachment to the shaft and an opposite forward end with a ferrule body extending therebetween;”

111. Lint discloses this requirement of claim 1. Lint discloses that “the arrowhead of the present invention indicated generally at 10 includes a forward or pointed tip portion 11 and a body portion 12. The tip portion 11 may be removably attached to the body portion 12, as indicated at 13 in FIGURES 2 and 3, or the tip may be integrally secured to the body 12. The body 12 is of a generally tubular shape

and is provided with a bore 14 which is internally threaded as indicated at 15. The threads 15 of the bore 14 engage with threads 16 provided upon one end of an arrow shaft 17.” Ex. 1002, 2:29-38 and Fig. 1. I include an annotated version of Figure 2 of Lint in Paragraph 66.

CLAIM 1 – “a first blade member having a first end pivotally interconnected with the ferrule body and an opposite second end,”

112. Lint alone discloses this claim requirement of claim 1. Lint discloses: “The tubular body 12 of the arrowhead 10 is provided with two longitudinally extending slots or depressions 18 which are oppositely disposed at either side of the body 12. A barb 19 is contained in each of the slots 18 and is pivoted to the tubular body 12 by means of a pivot pin 20.” Ex. 1002, 2:39-45 and Fig. 2. I include an annotated version of Figure 2 of Lint in Paragraph 67.

113. If the Patent Owner contends that the “first blade member” requires a sharp edge, I would disagree. In my opinion, the plain and ordinary language of the claim does not require the “first blade member” to have a sharp edge. I have also reviewed the specification and file history of the ‘177 patent, and nothing in the specification and file history limits or otherwise requires the “first blade member” to have a sharp edge.

114. While the specification of the ‘177 patent describes the blade members as being able to “maximize the cutting surface of the arrowhead 10 through the soft

flesh of the animal,” a PHOSITA would readily understand that a sharp or cutting edge on the blade is not a mandatory element of the claim and that the exemplary embodiments described in the specification is not the only configuration. In the field of broadheads, the plain and ordinary meaning of “blade” does not inherently require a sharp edge. A PHOSITA understands that blades on a broadhead could be either sharp or blunt. A blunt or unsharpened blade may be desirable, for example, during target practice or when hunting small game. *See for example*, Ex. 1010, 5:44-55 (disclosing blades in which the leading edges are blunt or unsharpened: “this side 46' may be unsharpened as shown in FIG. XI. Another form of the triangular blade 40' may be the reverse of those shown in FIGS. IX, X, and XI, namely with the forward edge 48 being the shorter side of the triangular blade, and not be sharpened as shown in FIG. XII, thus forming a blunt arrowhead for stunning rather than cutting.”).

115. Nevertheless, it would have been obvious to a PHOSITA to simply add a sharp edge to the first blade member disclosed in Lint because a PHOSITA would know that would be several advantages to adding sharp edges to the blades, or barbs, of Lint. The advantages of doing so is disclosed in the prior art and within the knowledge of a PHOSITA. For example, Minisini is directed toward “arrows and more particularly to an arrow especially designed for shooting fish, but which is adaptable for other uses.” Ex. 1004, 1: 15-17. Minisini discloses an “arrowhead H

includes a ferrule 12 having an internal socket 13 into which is fitted the forward end of the arrow shaft.” Ex. 1005, 2:10-12. The ferrule contains a barb with “its forward end rockably mounted on a pivot pin 21” Ex. 1005, 2:27-29. Minisini discloses that the “barb preferably has its outer longitudinal edge sharpened to cut through a fish” Ex. 1005, 2:31-34.

116. Krieger is directed to “arrows and more particularly to arrowheads.” Ex. 1006, 1:1-2. Krieger discloses that “[t]o reduce air friction the longitudinal edges of the wings or blades are sharpened to knife edges.” Ex. 1006, 2:10-12.

117. Moreover, numerous other prior art disclose that blades and barbs are “typically sharpened to better allow the arrow head to penetrate a target.” Ex. 1007, 2:56-58; Ex. 1008, 4:21-23.

118. It would have been obvious to a PHOSITA to simply add a sharp edge as taught by either Minisini or Krieger to the first blade member disclosed in Lint. Both Lint, Minisini, and Krieger are in the same field of endeavor. The use of sharp edges on expandable barbs, or blade members, has been a well-known technique for decades. Moreover, it would have been obvious to a PHOSITA to simply to add a sharp edge to further expedite hemorrhaging which ultimately leads to humane discharge of game animals while greatly enhancing the aerodynamic flight characteristics of broadheads. Such practices date back some 15,700 years, when the

earliest of ancient arrowheads have been documented in primitive fishing and hunting activities. See for example Ex. 1014.

119. In my opinion, the resulting combination is nothing more than a simple design choice combining elements that were known in the prior art, making no change to their respective functions to achieve resulting combination that yields nothing more than results which would have been predictable to a person of ordinary skill in the art.

CLAIM 1 – “the first blade member having a retracted position wherein the second end is spaced from the ferrule body at a first distance and an extended position wherein the second end is spaced from the ferrule body by a distance which is greater than the first distance;”

120. Lint discloses this claim requirement of claim 1. Lint discloses: “Each of said barbs 19 includes an outer barb portion 21 which projects outwardly and rearwardly of the arrowhead body 12 when the barbs 19 are in the open position as illustrated by FIGURE 2.” Ex. 1002, 2:45-48 and Fig. 2. Lint discloses “when the arrowhead 10 penetrates the flesh of an animal, the initial impact on the outer portions 21 of the barbs 19 causes the barbs to be retracted into the slots 18 against the bias of the spring 24.” Ex. 1002, 2:64-67. Figures 2 and 3 of Lint shows that the space between the first blade member and the ferrule body is greater when the first blade member is in an extended position. Ex. 1002, Figs. 2 and 3. I included annotated versions of Figures 2 and 3 in Paragraph 68.

CLAIM 1 – “a second blade member having a first end pivotally interconnected with the ferrule body and an opposite second end,”

121. Lint alone discloses this claim requirement of claim 1. Lint discloses: “The tubular body 12 of the arrowhead 10 is provided with two longitudinally extending slots or depressions 18 which are oppositely disposed at either side of the body 12. A barb 19 is contained in each of the slots 18 and is pivoted to the tubular body 12 by means of a pivot pin 20.”(Ex. 1002, 2:39-45 and Fig. 2. I include an annotated version of Figure 2 in Paragraph 69.

122. If the Patent Owner contends that the “second blade member” requires a sharp edge, I would disagree. In my opinion, the plain and ordinary language of the claim does not require the “second blade member” to have a sharp edge. I have also reviewed the specification and file history of the ‘177 patent, and nothing in the specification and file history limits or otherwise requires the “second blade member” to have a sharp edge.

123. While the specification of the ‘177 patent describes the blade members as being able to “maximize the cutting surface of the arrowhead 10 through the soft flesh of the animal,” a PHOSITA would readily understand that a sharp or cutting edge on the blade is not a mandatory element of the claim and that the exemplary embodiments described in the specification is not the only configuration. In the field of broadheads, the plain and ordinary meaning of “blade” does not inherently require

a sharp edge. A PHOSITA understands that blades on a broadhead could be either sharp or blunt. A blunt or unsharpened blade may be desirable during target practice or when hunting small game. *See for example*, Ex. 1010, 5:44-55 (disclosing blades in which the leading edges are blunt or unsharpened: “this side 46' may be unsharpened as shown in FIG. XI. Another form of the triangular blade 40' may be the reverse of those shown in FIGS. IX, X, and XI, namely with the forward edge 48 being the shorter side of the triangular blade, and not be sharpened as shown in FIG. XII, thus forming a blunt arrowhead for stunning rather than cutting.”).

124. Nevertheless, it would have been obvious to a PHOSITA to simply add a sharp edge to the second blade member disclosed in Lint because a PHOSITA would know that would be several advantages to adding a sharp edges to the blades, or barbs, of Lint. The advantages of doing so is disclosed in the prior art and within the knowledge of a PHOSITA. For example, Minisini is directed toward “arrows and more particularly to an arrow especially designed for shooting fish, but which is adaptable for other uses.” Ex. 1004, 1: 15-17. Minisini discloses an “arrowhead H includes a ferrule 12 having an internal socket 13 into which is fitted the forward end of the arrow shaft.” Ex. 1005, 2:10-12. The ferrule contains a barb with “its forward end rockably mounted on a pivot pin 21” Ex. 1005, 2:27-29. Minisini discloses that the “barb preferably has its outer longitudinal edge sharpened to cut through a fish” Ex. 1005, 2:31-34.

125. Krieger is directed to “arrows and more particularly to arrowheads.” Ex. 1006, 1:1-2. Krieger discloses that “[t]o reduce air friction the longitudinal edges of the wings or blades are sharpened to knife edges.” Ex. 1006, 2:10-12.

126. Moreover, numerous other prior art disclose that blades and barbs are “typically sharpened to better allow the arrow head to penetrate a target.” Ex. 1007, 2:56-58; Ex. 1008, 4:21-23.

127. It would have been obvious to a PHOSITA to simply add a sharp edge as taught by either Minisini or Krieger to the second blade member disclosed in Lint. Both Lint, Minisini, and Krieger are in the same field of endeavor. The use of sharp edges on expandable barbs, or blade members, has been a well-known technique for decades. Moreover, it would have been obvious to a PHOSITA to simply to add a sharp edge to further expedite hemorrhaging which ultimately leads to humane discharge of game animals while greatly enhancing the aerodynamic flight characteristics of broadheads. Such practices date back some 15,700 years, when the earliest of ancient arrowheads have been documented in primitive fishing and hunting activities

128. In my opinion, the resulting combination is nothing more than combining elements that were known in the prior art, making no change to their respective functions to achieve a resulting combination that yields nothing more than results which would have been predictable to a PHOSITA.

CLAIM 1 – “the [second] blade member having a retracted position wherein the second end is spaced from the ferrule body at a first distance and an extended position wherein the second end is spaced from the ferrule body by a distance which is greater than the first distance; and”

129. Lint discloses this claim requirement of claim 1. Lint discloses: “Each of said barbs 19 includes an outer barb portion 21 which projects outwardly and rearwardly of the arrowhead body 12 when the barbs 19 are in the open position as illustrated by FIGURE 2.” Ex. 1002, 2:45-48 and Fig. 2. Lint discloses “when the arrowhead 10 penetrates the flesh of an animal, the initial impact on the outer portions 21 of the barbs 19 causes the barbs to be retracted into the slots 18 against the bias of the spring 24.” Ex. 1002, 2:64-67. Figures 2 and 3 of Lint shows that the space between the second blade member and the ferrule body is greater when the second blade member is in an extended position. Ex. 1002, Figs. 2 and 3. I include annotated versions of Figures 2 and 3 in Paragraph 70.

CLAIM 1 – “at least one biasing member biasing the first and second blade members towards the extended positions, the biasing member being the only element operable to hold the blade members in the extended position.”

130. Lint discloses this requirement of claim 1 of claim 1. Lint discloses: “A spring 24 is provided within the bore 14 of the body 12 and extends between the tip portion 11 of the arrowhead 10 and the forward surface of the transversely extending inner barb portions 22. This spring operates to bias the barbs 19 in the open position illustrated by FIGURE 2.” Ex. 1002, 2:53-58 and Fig. 2. As shown in

Figure 2 in Lint, the spring is the only element operable to hold the blade members in the extended position. *Id.* I include an annotated version of Figure 2 in Paragraph 71.

CLAIM 2 – “wherein: the pivotal interconnection between the first blade member and the ferrule body is at a fixed position relative to the ferrule body; and the pivotal interconnection between the second blade member and the ferrule body being at a fixed position relative to the ferrule body.”

131. Lint discloses this requirement of claim 2. As shown in Figures 2 and 3 of Lint, the pivotal interconnections between the first blade member and the ferrule body and between the second blade member and the ferrule body are fixed position relative to the ferrule body. Ex. 1002, Figs. 2 and 3. I include an annotated version of Figure 2 in Paragraph 72.

CLAIM 3 – “wherein: the pivotal interconnection between the first blade member and the ferrule body and the pivotal interconnection between the second blade member and the ferrule body are substantially equidistant from the forward end of the ferrule.”

132. Lint discloses this requirement of claim 3. As shown in Figure 2 of Lint, the pivotal interconnections between the first blade member and the ferrule body and between the second blade member and the ferrule body are substantially equidistant from the forward end of the ferrule. Ex. 1002, Fig. 2. I include an annotated version of Figure 2 in Paragraph 73.

CLAIM 4 – “wherein: the first ends of the first and second blade members are forward ends and the second ends are rearward ends.”

133. Lint discloses this requirement of claim 4. Lint discloses: “A barb 19 is contained in each of the slots 18 and is pivoted to the tubular body 12 by means of a pivot pin 20. Each of said barbs 19 includes an outer barb portion 21 which projects outwardly and rearwardly of the arrowhead body 12 when the barbs 19 are in the open position as illustrated by FIGURE 2. Outer barb portions 21 extend angularly from the inner barb ends 22 which project through the forward portions 23 of the slots 18 into the bore 14 of the tubular body 12.” Ex. 1002, 2:42-50. I include an annotated version of Figure 2 in Paragraph 74.

CLAIM 7 – “a retaining element engaging the blade members to maintain the blade members in the retracted position.”

134. Lint discloses this requirement of claim 7. Lint discloses: “To remove the arrowhead from the animal, the barbs may be again retracted by threading the shaft 17 into the bore 14 until the shaft contacts the outer surfaces of the inner barb portions 22. When this contact occurs, further inward threading of the shaft within the bore 14 will cause the barbs 19 to be retracted within the slots 18, as illustrated by FIGURE 3.” Ex. 2:70-3:4. I include an annotated version of Figure 3 in Paragraph 75.

CLAIM 9 – “wherein: the biasing member is a coil spring.”

135. Lint discloses this requirement of claim 9. Lint discloses: “A spring 24 is provided within the bore 14 of the body 12 and extends between the tip portion 11 of the arrowhead 10 and the forward surface of the transversely extending inner barb portions 22. This spring operates to bias the barbs 19 in the open position illustrated by FIGURE 2.” Ex. 1002, 2:53-58 and Fig. 2.

CLAIM 11 – “A broadhead for an arrow having a shaft, the broadhead comprising:”

136. With respect to claim 11, Lint discloses an “arrowhead” that “includes a forward or pointed tip portion 11 and a body portion 12 . . . The body 12 is of a generally tubular shape and is provided with a bore 14 which is internally threaded as indicated at 15. The threads 15 of the bore 14 engage with threads 16 provided upon one end of an arrow shaft 17.” Ex. 1002, 2:29-38.

CLAIM 11 – “a ferrule having a rearward end configured for attachment to the shaft and an opposite forward end with a ferrule body extending therebetween,”

137. Lint discloses this requirement of claim 11. Lint discloses that “the arrowhead of the present invention indicated generally at 10 includes a forward or pointed tip portion 11 and a body portion 12. The tip portion 11 may be removably attached to the body portion 12, as indicated at 13 in FIGURES 2 and 3, or the tip may be integrally secured to the body 12. The body 12 is of a generally tubular shape

and is provided with a bore 14 which is internally threaded as indicated at 15. The threads 15 of the bore 14 engage with threads 16 provided upon one end of an arrow shaft 17.” Ex. 1002, 2:29-38 and Fig. 1. I include an annotated version of Figure 1 of Lint in Paragraph 67.

CLAIM 11 – “the forward end of the ferrule defining the forward tip of the arrow and being fixed with respect to the ferrule body;”

138. Lint discloses this requirement of claim 11. Lint discloses: “[T]he arrowhead of the present invention indicated generally at 10 includes a forward or pointed tip portion 11 and a body portion 12. The tip portion 11 may be removably attached to the body portion 12, as indicated at 13 in FIGURES 2 and 3, or the tip may be integrally secured to the body 12.” Ex. 1002, 2:29-34.

CLAIM 11 – “a first blade member having a forward end pivotally interconnected with the ferrule body and an opposite rearward end,”

139. Lint discloses this requirement of claim 11. Lint discloses: “A barb 19 is contained in each of the slots 18 and is pivoted to the tubular body 12 by means of a pivot pin 20.” Ex. 1002, 2:43-45 and Fig. 2. I include an annotated version of Figure 2 in Paragraph 68.

140. If the Patent Owner contends that the “first blade member” requires a sharp edge, I would disagree. In my opinion, the plain and ordinary language of the claim does not require the “first blade member” to have a sharp edge. I have also

reviewed the specification and file history of the ‘177 patent, and nothing in the specification and file history limits or otherwise requires the “first blade member” to have a sharp edge.

141. While the specification of the ‘177 patent describes the blade members as being able to “maximize the cutting surface of the arrowhead 10 through the soft flesh of the animal,” a PHOSITA would readily understand that a sharp or cutting edge on the blade is not a mandatory element of the claim and that the exemplary embodiments described in the specification is not the only configuration. In the field of broadheads, the plain and ordinary meaning of “blade” does not inherently require a sharp edge. A PHOSITA understands that blades on a broadhead could be either sharp or blunt. A blunt or unsharpened blade may be desirable during target practice or when hunting small game. *See for example*, Ex. 1010, 5:44-55 (disclosing blades in which the leading edges are blunt or unsharpened: “this side 46' may be unsharpened as shown in FIG. XI. Another form of the triangular blade 40' may be the reverse of those shown in FIGS. IX, X, and XI, namely with the forward edge 48 being the shorter side of the triangular blade, and not be sharpened as shown in FIG. XII, thus forming a blunt arrowhead for stunning rather than cutting.”).

142. Nevertheless, it would have been obvious to a PHOSITA to simply add a sharp edge to the first blade member disclosed in Lint because a PHOSITA would know that would be several advantages to adding a sharp edges to the blades, or

barbs, of Lint. The advantages of doing so is disclosed in the prior art and within the knowledge of a PHOSITA. For example, Minisini is directed toward “arrows and more particularly to an arrow especially designed for shooting fish, but which is adaptable for other uses.” Ex. 1004, 1: 15-17. Minisini discloses an “arrowhead H includes a ferrule 12 having an internal socket 13 into which is fitted the forward end of the arrow shaft.” Ex. 1005, 2:10-12. The ferrule contains a barb with “its forward end rockably mounted on a pivot pin 21” Ex. 1005, 2:27-29. Minisini discloses that the “barb preferably has its outer longitudinal edge sharpened to cut through a fish” Ex. 1005, 2:31-34.

143. Krieger is directed to “arrows and more particularly to arrowheads.” Ex. 1006, 1:1-2. Krieger discloses that “[t]o reduce air friction the longitudinal edges of the wings or blades are sharpened to knife edges.” Ex. 1006, 2:10-12.

144. Moreover, numerous other prior art disclose that blades and barbs are “typically sharpened to better allow the arrow head to penetrate a target.” Ex. 1007, 2:56-58; Ex. 1008, 4:21-23.

145. It would have been obvious to a PHOSITA to simply add a sharp edge as taught by either Minisini or Krieger to the first blade member disclosed in Lint. Both Lint, Minisini, and Krieger are in the same field of endeavor. The use of sharp edges on expandable barbs, or blade members, has been a well-known technique for decades. Moreover, it would have been obvious to a PHOSITA to simply to add a

sharp edge to further expedite hemorrhaging which ultimately leads to humane discharge of game animals while greatly enhancing the aerodynamic flight characteristics of broadheads. Such practices date back some 15,700 years, when the earliest of ancient arrowheads have been documented in primitive fishing and hunting activities.

146. In my opinion, the resulting combination is nothing more than combining elements that were known in the prior art, making no change to their respective functions to achieve resulting combination that yields nothing more than results which would have been predictable to a person of ordinary skill in the art.

CLAIM 11 – “the first blade member having a retracted position wherein the rearward end is spaced from the ferrule body at a first distance and an extended position wherein the rearward end is spaced from the ferrule body by a distance which is greater than the first distance,”

147. Lint discloses this requirement of claim 11. Lint discloses: “Each of said barbs 19 includes an outer barb portion 21 which projects outwardly and rearwardly of the arrowhead body 12 when the barbs 19 are in the open position as illustrated by FIGURE 2.” Ex. 1002, 2:45-48; Fig. 2 and Fig. 3. Figures 2 and 3 of Lint show that the space between the first blade member and the ferrule body is greater when the first blade member is in an extended position. Ex. 1002, Figs. 2 and 3. I include annotated versions of Figures 2 and 3 in Paragraph 69.

CLAIM 11 – “the pivotal interconnection between the first blade member and the ferrule body being at a fixed position relative to the ferrule body;”

148. Lint discloses this requirement of claim 11. Lint discloses: “A barb 19 is contained in each of the slots 18 and is pivoted to the tubular body 12 by means of a pivot pin 20.” Ex. 1002, 2:43-45; Fig. 2 and Fig. 3. Figures 2 and 3 disclose that the pivotal interconnection between the first blade member and the ferrule body is at a fixed position relative to the ferrule body. I include an annotated version of Figure 2 in Paragraph 73.

CLAIM 11 – “a second blade member having a forward end pivotally interconnected with the ferrule body and an opposite rearward end,”

149. Lint discloses this requirement of claim 11. Lint discloses: “A barb 19 is contained in each of the slots 18 and is pivoted to the tubular body 12 by means of a pivot pin 20.” Ex. 1002, 2:43-45 and Fig. 2. I include an annotated version of Figure 2 in Paragraph 70.

150. If the Patent Owner contends that “second blade member” requires a sharp edge, I would disagree. In my opinion, the plain and ordinary language of the claim does not require the “second blade member” to have a sharp edge, for the same reasons discussed above with respect to “first blade member.” In any event, it would have been obvious to a PHOSITA to simply add a sharp edge to the second blade member disclosed in Lint because a person of ordinary skill in the art would know

that would be several advantages to adding a sharp edges to the blades, or barbs, of Lint. The advantages of doing so is disclosed in the prior art and within the knowledge of a PHOSITA.

151. For example, Minisini is directed toward “arrows and more particularly to an arrow especially designed for shooting fish, but which is adaptable for other uses.” Ex. 1004, 1: 15-17. Minisini discloses an “arrowhead H includes a ferrule 12 having an internal socket 13 into which is fitted the forward end of the arrow shaft.” Ex. 1005, 2:10-12. The ferrule contains a barb with “its forward end rockably mounted on a pivot pin 21” Ex. 1005, 2:27-29. Minisini discloses that the “barb preferably has its outer longitudinal edge sharpened to cut through a fish” Ex. 1005, 2:31-34.

152. Krieger is directed to “arrows and more particularly to arrowheads.” Ex. 1006, 1:1-2. Krieger discloses that “[t]o reduce air friction the longitudinal edges of the wings or blades are sharpened to knife edges.” Ex. 1006, 2:10-12.

153. Moreover, numerous other prior art disclose that blades and barbs are “typically sharpened to better allow the arrow head to penetrate a target.” Ex. 1007, 2:56-58; Ex. 1008, 4:21-23.

154. It would have been obvious to a PHOSITA to simply add a sharp edge as taught by either Minisini or Krieger to the second blade member disclosed in Lint. Both Lint, Minisini, and Krieger are in the same field of endeavor. The use of sharp

edges on expandable barbs, or blade members, has been a well-known technique for decades. Moreover, it would have been obvious to a PHOSITA to simply to add a sharp edge to further expedite hemorrhaging which ultimately leads to humane discharge of game animals while greatly enhancing the aerodynamic flight characteristics of broadheads. Such practices date back some 15,700 years, when the earliest of ancient arrowheads have been documented in primitive fishing and hunting activities

155. In my opinion, the resulting combination is nothing more than combining elements that were known in the prior art, making no change to their respective functions to achieve resulting combination that yields nothing more than results which would have been predictable to a PHOSITA.

CLAIM 11 – “the second blade member having a retracted position wherein the rearward end is spaced from the ferrule body at a first distance and an extended position wherein the rearward end is spaced from the ferrule body by a distance which is greater than the first distance,”

156. Lint discloses this requirement of claim 11. Lint discloses: “Each of said barbs 19 includes an outer barb portion 21 which projects outwardly and rearwardly of the arrowhead body 12 when the barbs 19 are in the open position as illustrated by FIGURE 2.” Ex. 1002, 2:45-48 and Fig. 2. Figures 2 and 3 of Lint show that the space between the second blade member and the ferrule body is greater

when the second blade member is in an extended position. Ex. 1002, Figs. 2 and 3.

I included annotated versions of Figures 2 and 3 in Paragraph 71.

CLAIM 11 – “the pivotal interconnection between the second blade member and the ferrule body being at a fixed position relative to the ferrule body; and”

157. Lint discloses this requirement of claim 11. Lint discloses: “A barb 19 is contained in each of the slots 18 and is pivoted to the tubular body 12 by means of a pivot pin 20.” Ex. 1002, 2:43-45; Fig. 2 and Fig. 3. Figures 2 and 3 disclose that the pivotal interconnection between the second blade member and the ferrule body is at a fixed position relative to the ferrule body. I include an annotated version of Figure 2 in Paragraph 73.

CLAIM 11 – “at least one biasing member biasing the first and second blade members towards the extended positions.”

158. Lint discloses this requirement of claim 11. Lint discloses: “A spring 24 is provided within the bore 14 of the body 12 and extends between the tip portion 11 of the arrowhead 10 and the forward surface of the transversely extending inner barb portions 22. This spring operates to bias the barbs 19 in the open position illustrated by FIGURE 2.” Ex. 1002, 2:53-58 and Fig. 2. I include an annotated version of Figure 2 in Paragraph 72.

CLAIM 12 – “wherein: the pivotal interconnection between the first blade member and the ferrule body and the pivotal interconnection between the second blade member and the ferrule body are substantially equidistant from the forward end of the ferrule.”

159. Lint discloses this requirement of claim 12. As shown in Figure 2 in Lint, the pivotal interconnections between the first blade member and the ferrule body and between the second blade member and the ferrule body are substantially equidistant from the forward end of the ferrule. Ex. 1002, Fig. 2. I include an annotated version of Figure 2 in Paragraph 74.

CLAIM 15 – “a retaining element engaging the blade members to maintain the blade members in the retracted position.”

160. Lint discloses this requirement of claim 15. Lint discloses: “To remove the arrowhead from the animal, the barbs may be again retracted by threading the shaft 17 into the bore 14 until the shaft contacts the outer surfaces of the inner barb portions 22. When this contact occurs, further inward threading of the shaft within the bore 14 will cause the barbs 19 to be retracted within the slots 18, as illustrated by FIGURE 3.” Ex. 1002, 2:70-3:4. I include an annotated version of Figure 3 in Paragraph 76.

CLAIM 17 – “wherein: the biasing member is a coil spring.”

161. Lint discloses this requirement of claim 17. Lint discloses: “A spring 24 is provided within the bore 14 of the body 12 and extends between the tip portion 11 of the arrowhead 10 and the forward surface of the transversely extending inner barb

portions 22. This spring operates to bias the barbs 19 in the open position illustrated by FIGURE 2.” Ex. 1002, 2:53-58 and Fig. 2.

1. Motivation to Combine

162. As discussed above, it is my opinion, Lint discloses all the requirements of 1-4, 7, 9, 11, 12, 15, and 17 of the ‘177 patent. If the Patent Owner contends that the blades, or barbs, of Lint require a sharp edge, I disagree for at least the reasons discussed above. In any event, in my opinion, it would have been obvious to a PHOSITA to add sharp edge to the blades, or barbs, of Lint. A PHOSITA would have known that doing so would have been a predictable use of prior art elements according to their established functions. A PHOSITA would have been aware of the teachings of Lint, Minisini, and Krieger and would have been motivated and readily able to combine their teachings to simply add sharp edges to the blades, or barbs, of Lint. As demonstrated by Minisini and Krieger, a PHOSITA would have known that adding sharp edges to such blades, or barbs, would facilitate cutting flesh and improve the flight characteristics of the broadhead. A PHOSITA would have recognized that adding sharp edges to such blades, or barbs, is nothing more than an anticipated, obvious, and routine application of known elements.

2. Reasonable Expectation of Success

163. A PHOSITA combining Lint, Minisini, and Krieger would have a reasonable expectation of success. There are no technical challenges to adding a sharp edge to the blade members, or barbs, disclosed in Lint.

D. Ground IV: Claims 11, 12, 15, and 17 are Obvious Over Hendricks Alone or in Combination of the Knowledge of a PHOSITA

164. I have compared claims 11, 12, 15, and 17 to Hendricks. It is my opinion that the Hendricks alone or in combination with the knowledge of a PHOSITA renders claims 11, 12, 15, and 17 obvious. Below, I address each claim limitation.

Claim 11 of '177 Patent	Hendricks
A broadhead for an arrow having a shaft, the broadhead comprising:	Hendricks discloses: “ A head for a spear or like weapon having a tip section and a body section . . . ” Ex. 1013, Abstract. Hendricks discloses that the body section “is internally threaded so as to receive the threaded reduced forward end portion 22 of a weapon shaft 24.” Ex. 1013, 2:5-7.
a ferrule having a rearward end configured for attachment to the shaft and an opposite forward end with a ferrule body extending therebetween,	Hendricks discloses: “The weapon head illustrated in FIGS. 1-4 include the tip section which is preferably conical and a body section 12 which is preferably cylindrical and which extends rearwardly from tip 10. Body section 12 of the weapon head has a longitudinal slot 14 formed therein, slot 14 is defined in

Claim 11 of '177 Patent	Hendricks
	part by spaced side parts 16 and an interconnecting base part 18. The rear end portion 13 of body section 12 preferably has an axial bore 20 formed therein which communicates with longitudinal slot 14 in body 12 and which is internally threaded so as to receive the threaded reduced forward end portion 22 of a weapon shaft 24.” Ex. 1013, 1:72-2:7. I include an annotated version of Figure 3 of Hendricks in Paragraph 166 below.
the forward end of the ferrule defining the forward tip of the arrow and being fixed with respect to the ferrule body;	Hendricks discloses: “The weapon head illustrated in FIGS. 1-4 include the tip section which is preferably conical and a body section 12 which is preferably cylindrical and which extends rearwardly from tip 10.” Ex. 1013, 1:72-75. Figure 3 of Hendricks shows that the tip 10 is fixed in relation to the ferrule body. I include an annotated version of Figure 3 of Hendricks in Paragraph 167 below.
a first blade member having a forward end pivotally interconnected with the ferrule body and an opposite rearward end,	Hendricks discloses: “A barb 26 is positioned within longitudinal slot 14 of body section 12 and is pivotally connected at its forward end to body section 12. One means of connecting barb 26 to body section 12 is by a pin 28 which is inserted through registering apertures in the barb and

Claim 11 of '177 Patent	Hendricks
	the side parts 16 of body section 12.” Ex. 1013, 2:7-12. Figure 3 of Hendricks shows the first blade member having a forward end pivotally interconnected with the ferrule body and an opposite rearward end. I include an annotated version of Figure 3 of Hendricks in Paragraph 168 below.
the first blade member having a retracted position wherein the rearward end is spaced from the ferrule body at a first distance and an extended position wherein the rearward end is spaced from the ferrule body by a distance which is greater than the first distance,	Hendricks discloses: “Barb 26 is swingable about its pivot connection between a closed position in which it is substantially entirely received within slot 14, as shown in FIG. 1, and an open position in which its free end projects laterally outwardly of the body 12, as shown in FIG. 4.” Ex. 1013, 2:12-16. Figures 3 and 4 in Hendricks show that the space between the first blade member and the ferrule body is greater when the first blade member is in an extended position. I include annotated versions of Figures 3 and 4 of Hendricks in Paragraph 170 below.
the pivotal interconnection between the first blade member and the ferrule body being at a fixed position relative to the ferrule body;	Figure 3 in Hendricks, for example, discloses that the pivotal interconnection between the first blade member and the ferrule body is at a fixed position relative to the ferrule body. Ex. 1013, Fig. 3. I include an annotated version of Figure 3 of Hendricks in Paragraph 171 below.

Claim 11 of '177 Patent	Hendricks
a second blade member having a forward end pivotally interconnected with the ferrule body and an opposite rearward end,	Although Hendricks expressly discloses a single blade member, it would have been obvious for a PHOSITA to add a second blade member to the broadhead. The second blade member would be constructed the same as the first blade member, and have the same function. Implementing a second blade member in a broadhead like that disclosed in Hendricks was already routine, and a PHOSITA would understand that it would have been an obvious variation of Hendricks to add a second blade member. A PHOSITA would know that adding a second blade member to Hendricks would be advantageous for several reasons. First, a PHOSITA would know that adding a second blade member would increase the cutting surface of the broadhead and thus make the broadhead more lethal. Second, a PHOSITA would know that adding a second blade member would improve the aerodynamics of the broadhead of Hendricks. A PHOSITA would know that for aerodynamic reasons, it is important to have an arrowhead that is balanced along a centerline axis of ferrule. Adding a second blade member to Hendricks would be preferred because it would evenly balance the arrowhead. Furthermore, any PHOSITA would know how to arrange a second blade

Claim 11 of '177 Patent	Hendricks
	member on the opposite side of the broadhead in the same manner that the first blade member is arranged. No skill or ingenuity would be required to construct such a broadhead given the teachings of Hendricks and the knowledge of a PHOSITA. A PHOSITA would know how to design and make a broadhead with two blade members, and it is obvious that anyone knowing how to design and make a broadhead would know how to arrange a second blade member opposite the first blade member in the Hendricks broadhead. Adding a second blade member to the broadhead in Hendricks would have been predictable and would not result in a new or unexpected result. For reference, in Paragraph 176 below, I include modified and annotated versions of Figures 3 and 4 of Hendricks showing the broadhead having a second blade member. As can be seen, the second blade member has a forward end pivotally interconnected with the ferrule body and an opposite rearward end.
the second blade member having a retracted position wherein the rearward end is spaced from the ferrule body at a first distance and an extended position wherein the rearward end is spaced from the ferrule body by a distance which is greater than the first distance,	For the same reasons stated above, it would have been obvious for a PHOSITA to add a second blade member to the broadhead. For reference, in Paragraph 177 below, I include modified and annotated versions of Figures 3 and 4 of

Claim 11 of '177 Patent	Hendricks
	Hendricks showing the broadhead having a second blade member. As can be seen, the second blade member has a retracted position wherein the rearward end is spaced from the ferrule body at a first distance and an extended position wherein the rearward end is spaced from the ferrule body by a distance which is greater than the first distance.
the pivotal interconnection between the second blade member and the ferrule body being at a fixed position relative to the ferrule body; and	For the same reasons stated above, it would have been obvious for a PHOSITA to add a second blade member to the broadhead. For reference, in Paragraph 178 below, I include modified and annotated versions of Figures 3 and 4 of Hendricks showing the broadhead having a second blade member. As can be seen, the pivotal interconnection between the second blade member and the ferrule body being at a fixed position relative to the ferrule body.
at least one biasing member biasing the first and second blade members towards the extended positions.	Hendricks discloses: “A resilient member 36, preferably of a rubber composition, is pressed into bore 34 and includes an end portion which projects beyond inner face 32 of barb 26 and which compressingly engages base part 18 of body section 12 when barb 26 is in its closed position.” Ex. 1013, 2:26-31. Hendricks discloses: “When the weapon head enters a target, projection 42 of catch 38

Claim 11 of '177 Patent	Hendricks
	engages a portion of the target and is pivoted rearwardly with respect to body section 12 causing the disengagement of lip 40 of the catch from insert part 31 of the barb. Barb 26 is then forced outwardly from its closed position by resilient member 36." Ex. 1013, 3:1-6. For the same reasons stated above, it would have been obvious for a PHOSITA to add a second blade member to the broadhead. For reference, in Paragraph 180 below, I include a modified and annotated version of Figure 3 of Hendricks. As can be seen, the resilient members bias the first and second blade members towards the extended positions.

Claim 12 of '177 Patent	Hendricks
A broadhead in accordance with claim 11, wherein: the pivotal interconnection between the first blade member and the ferrule body and the pivotal interconnection between the second blade member and the ferrule body are substantially equidistant from the forward end of the ferrule.	For the same reasons stated above, it would have been obvious for a PHOSITA to add a second blade member to the broadhead. For reference, in Paragraph 180 below, I include a modified and annotated version of Figure 3 of Hendricks. As can be seen, the pivotal interconnections between the first blade member and the ferrule body and between the second blade member and the ferrule body are

Claim 12 of '177 Patent	Hendricks
	substantially equidistant from the forward end of the ferrule.

Claim 15 of '177 Patent	Hendricks
A broadhead in accordance with claim 11, further comprising: a retaining element engaging the blade members to maintain the blade members in the retracted position.	Hendricks discloses: “A catch 38 is disposed within longitudinal slot 14 of body section 12 and is preferably positioned adjacently rearward of barb 26. Catch 38 is connected at one end to body section 12, preferably by a transverse pin 40, so as to be pivotal in a fore and aft direction within slot 14. The free end of catch 38 includes a lip 40 which is adapted to engage an inset part or shoulder 31 of barb outer side face 33 and retain barb 26 in its closed position.” Ex. 1013, 2:35-44. For the same reasons stated above, it would have been obvious for a PHOSITA to add a second blade member to the broadhead. For reference, in Paragraph 181 below, I include a modified and annotated version of Figure 3 of Hendricks. As can be seen, the catch on each blade member engages the blade members to maintain the blade members in the retracted position.

Claim 17 of '177 Patent	Hendricks
A broadhead in accordance with claim 11, wherein: the biasing member is a coil spring.	Hendricks discloses: “A resilient member 36, preferably of a rubber composition, is pressed into bore 34 and includes an end portion which projects beyond inner face 32 of barb 26 and which compressingly engages base part 18 of body section 12 when barb 26 is in its closed position.” Ex. 1013, 2:26-31. Hendricks discloses: “When the weapon head enters a target, projection 42 of catch 38 engages a portion of the target and is pivoted rearwardly with respect to body section 12 causing the disengagement of lip 40 of the catch from insert part 31 of the barb. Barb 26 is then forced outwardly from its closed position by resilient member 36.” Ex. 1013, 3:1-6. While Hendricks does not expressly disclose the use of a coil spring as the resilient member, or biasing member, it would have been obvious to a PHOSITA to use a coiled spring in the broadhead of Hendricks. The use of coiled springs in broadheads like that disclosed in Hendricks was already routine (see citations to exemplary prior art in Paragraph 185 below), and a PHOSITA would understand that it would have been an obvious variation of Hendricks to use a coiled spring as a biasing member. Furthermore, any PHOSITA would know how to arrange a coiled spring to

Claim 17 of '177 Patent	Hendricks
	function as a biasing member in the broadhead of Hendricks. No skill or ingenuity would be required to implement a coiled spring given the teachings of Hendricks and the knowledge of a PHOSITA. In my opinion, using a coiled spring as the biasing member would have been predictable and would not result in a new or unexpected result.

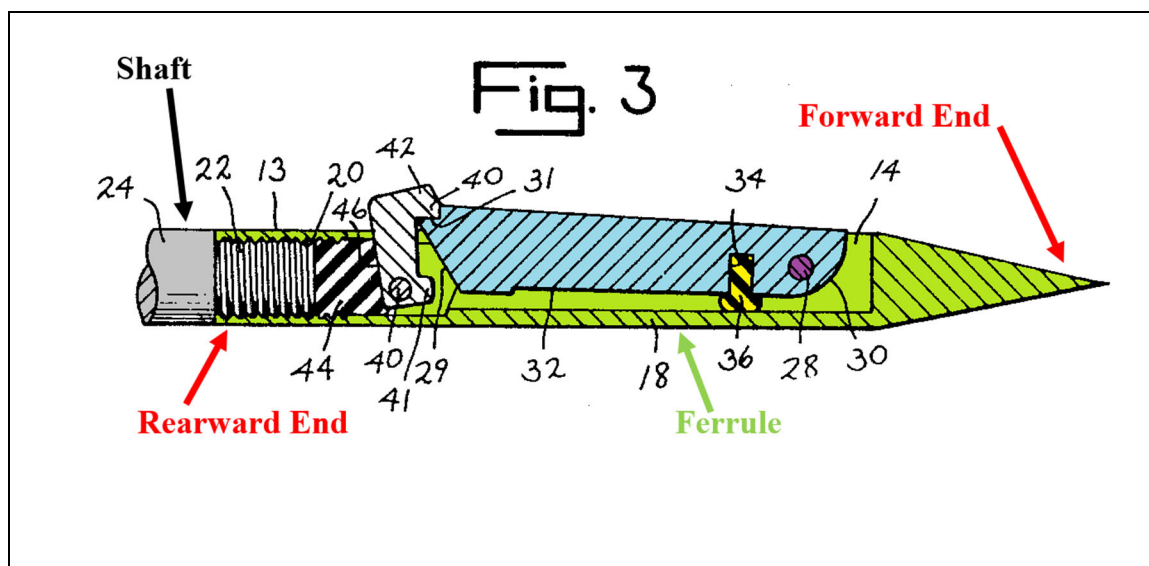
165. With regard to claims 11, 12, 15, and 17 of the '177 patent, as can be seen in the above chart, Hendricks alone or in combination with the knowledge of a PHOSITA discloses all the requirements of these claims. I further address these claims below.

CLAIM 11 – “A broadhead for an arrow having a shaft, the broadhead comprising:”

166. Hendricks discloses: “A head for a spear or like weapon having a tip section and a body section” Ex. 1013, Abstract. Hendricks discloses that the body section “is internally threaded so as to receive the threaded reduced forward end portion 22 of a weapon shaft 24.” Ex. 1013, 2:5-7.

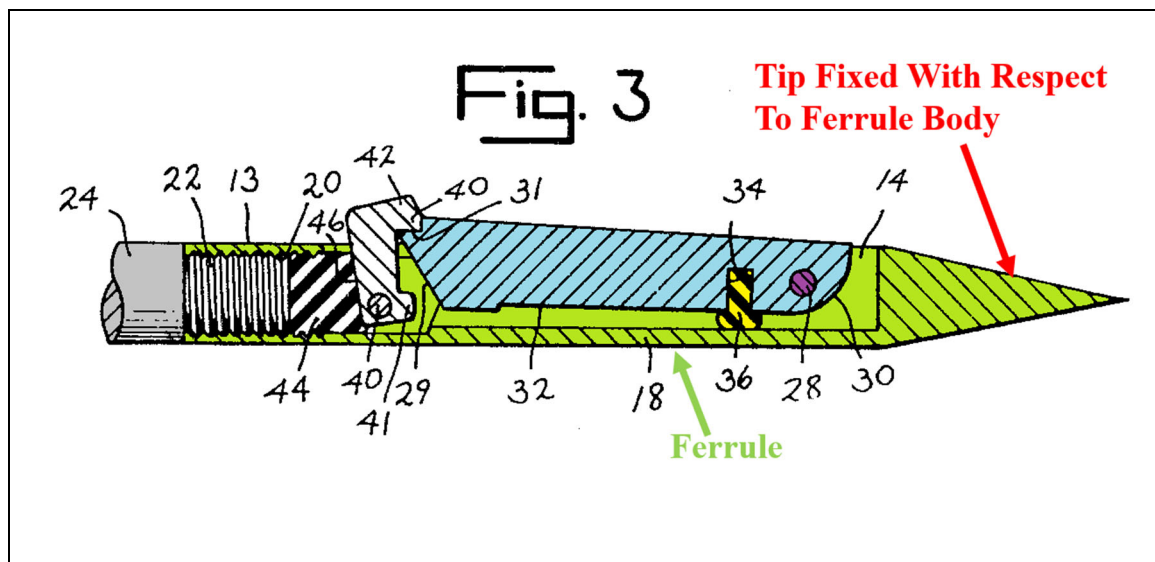
CLAIM 11 – “a ferrule having a rearward end configured for attachment to the shaft and an opposite forward end with a ferrule body extending therebetween,”

167. Hendricks discloses this requirement of claim 11. Hendricks discloses: “The weapon head illustrated in FIGS. 1-4 include the tip section which is preferably conical and a body section 12 which is preferably cylindrical and which extends rearwardly from tip 10. Body section 12 of the weapon head has a longitudinal slot 14 formed therein, slot 14 is defined in part by spaced side parts 16 and an interconnecting base part 18. The rear end portion 13 of body section 12 preferably has an axial bore 20 formed therein which communicates with longitudinal slot 14 in body 12 and which is internally threaded so as to receive the threaded reduced forward end portion 22 of a weapon shaft 24.” Ex. 1013, 1:72-2:7. I include an annotated version of Figure 3 in Hendricks below.



CLAIM 11 – “the forward end of the ferrule defining the forward tip of the arrow and being fixed with respect to the ferrule body;”

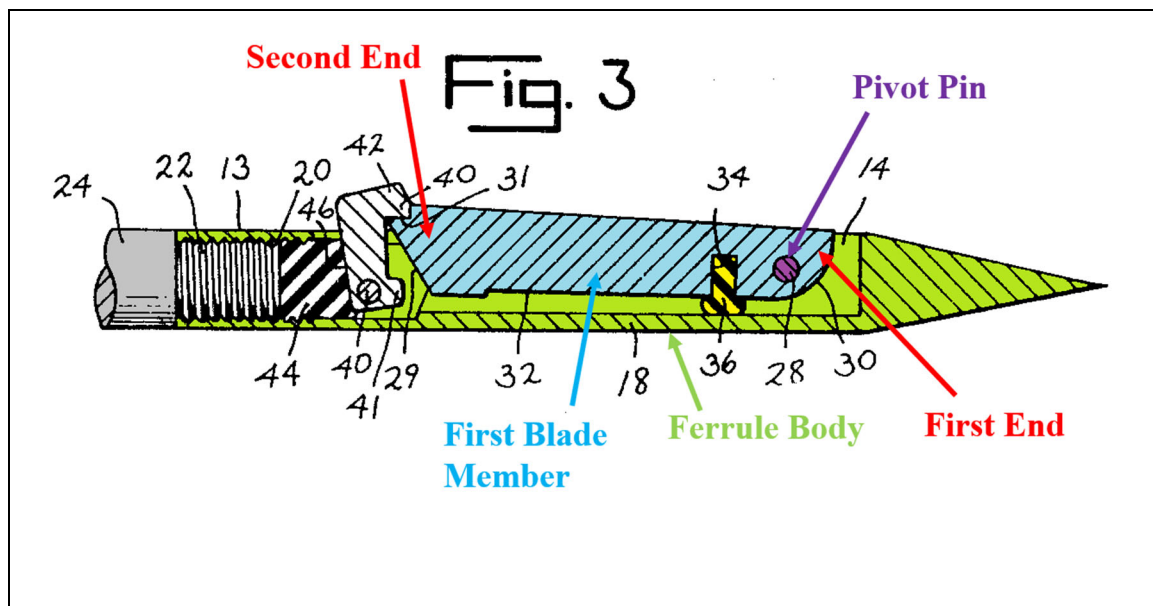
168. Hendricks discloses this requirement of claim 11. Hendricks discloses: “The weapon head illustrated in FIGS. 1-4 include the tip section which is preferably conical and a body section 12 which is preferably cylindrical and which extends rearwardly from tip 10.” Ex. 1013, 1:72-75. Figure 3 of Hendricks shows that the tip 10 is fixed in relation to the ferrule body. I include an annotated version of Figure 3 of Hendricks below.



CLAIM 11 – “a first blade member having a forward end pivotally interconnected with the ferrule body and an opposite rearward end,”

169. Hendricks discloses this requirement of claim 11. Hendricks discloses: “A barb 26 is positioned within longitudinal slot 14 of body section 12 and is pivotally connected at its forward end to body section 12. One means of

connecting barb 26 to body section 12 is by a pin 28 which is inserted through registering apertures in the barb and the side parts 16 of body section 12.” Ex. 1013, 2:7-12. Figure 3 of Hendricks shows the first blade member having a forward end pivotally interconnected with the ferrule body and an opposite rearward end. I include an annotated version of Figure 3 of Hendricks below.¹⁴

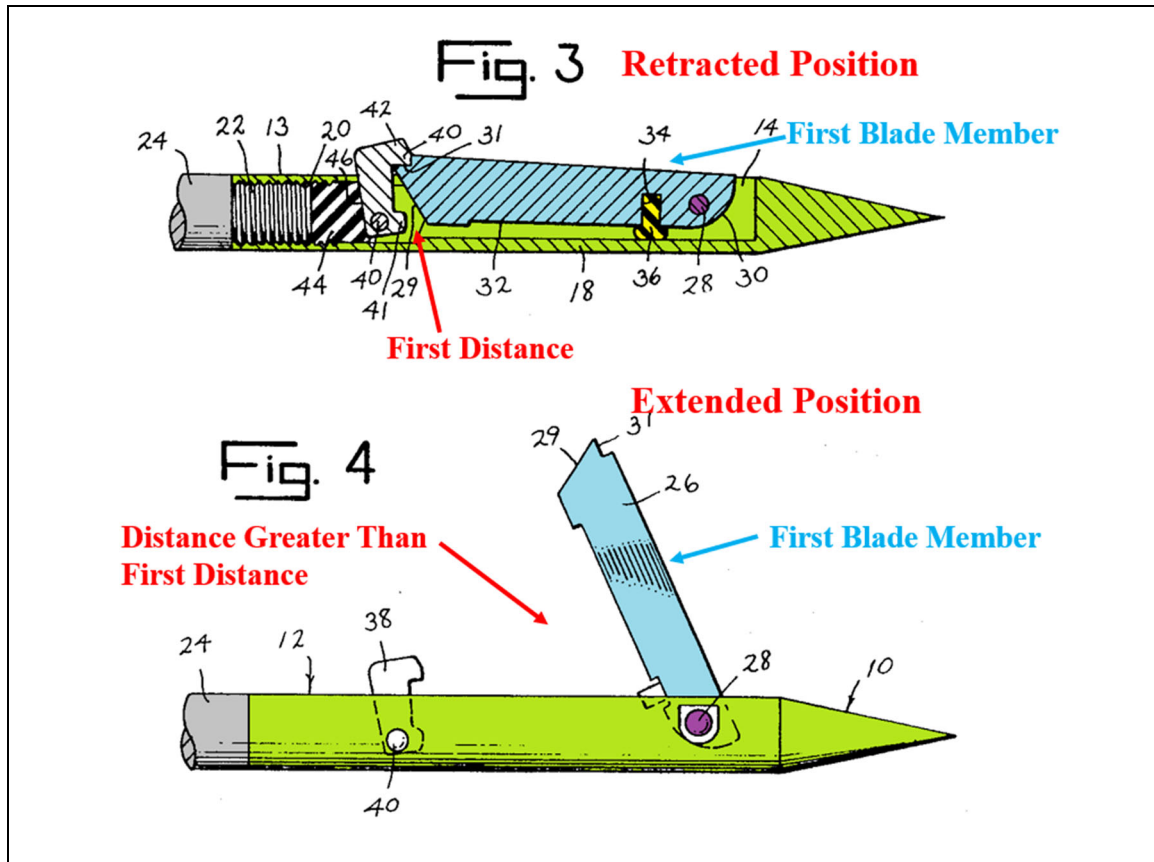


¹⁴ As explained in Paragraphs 112-118 above, the plain and ordinary language of the claim does not require that the “first blade member” contain a sharp edge. There is no express language in the claims for such a requirement, and there is no disclosure in the specification or prosecution history that would restrict or otherwise require that the “first blade member” contain a sharp edge. For the same reasons discussed above, it would have been obvious to a PHOSITA to add a sharp edge to the first blade member disclosed in Hendricks because a PHOSITA would know that sharp edges facilitate expeditious cutting of flesh, expedited hemorrhaging which ultimately leads to humane discharge of game animals while greatly enhancing the aerodynamic flight characteristics of broadheads. Adding sharp edges to arrowheads dates back some 15,700 years, when the earliest of ancient arrowheads have been documented in primitive fishing and hunting activities. An exemplar of an ancient fish point (a.k.a., an arrowhead) is shown in Ex. 1014.

CLAIM 11 – “the first blade member having a retracted position wherein the rearward end is spaced from the ferrule body at a first distance and an extended position wherein the rearward end is spaced from the ferrule body by a distance which is greater than the first distance,”

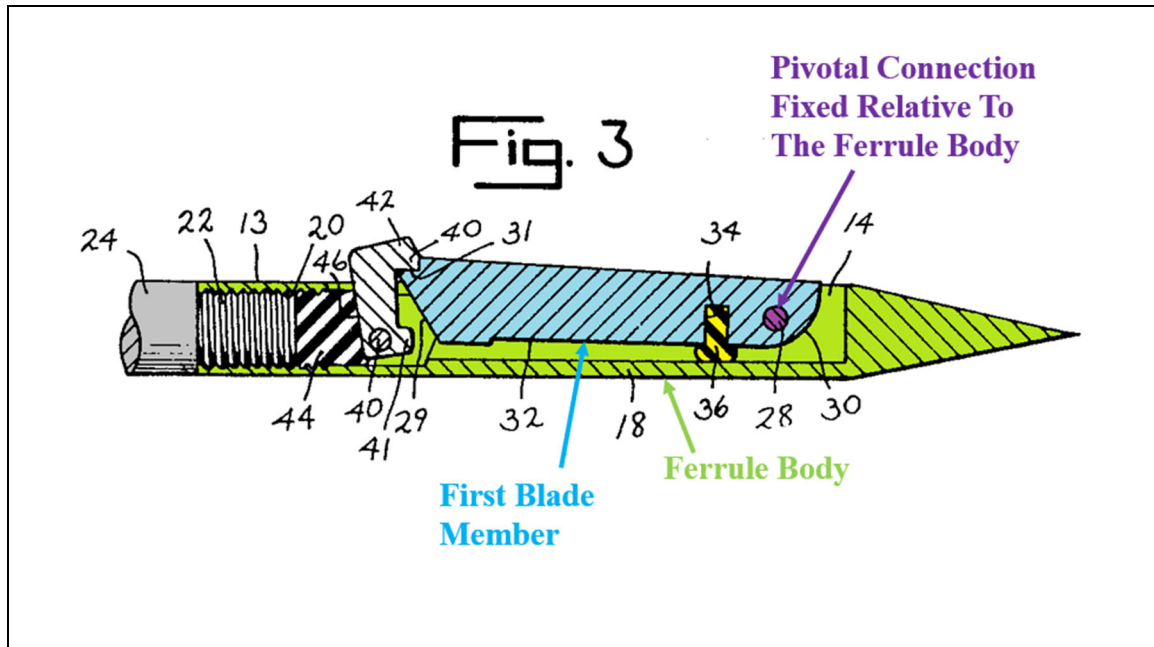
170. Hendricks discloses this requirement of claim 11. Hendricks discloses: “Barb 26 is swingable about its pivot connection between a closed position in which it is substantially entirely received within slot 14, as shown in FIG. 1, and an open position in which its free end projects laterally outwardly of the body 12, as shown in FIG. 4.” Ex. 1013, 2:12-16.

171. Figures 3 and 4 in Hendricks show that the space between the first blade member and the ferrule body is greater when the first blade member is in an extended position. I include annotated versions of Figures 3 and 4 below.



CLAIM 11 – “the pivotal interconnection between the first blade member and the ferrule body being at a fixed position relative to the ferrule body;”

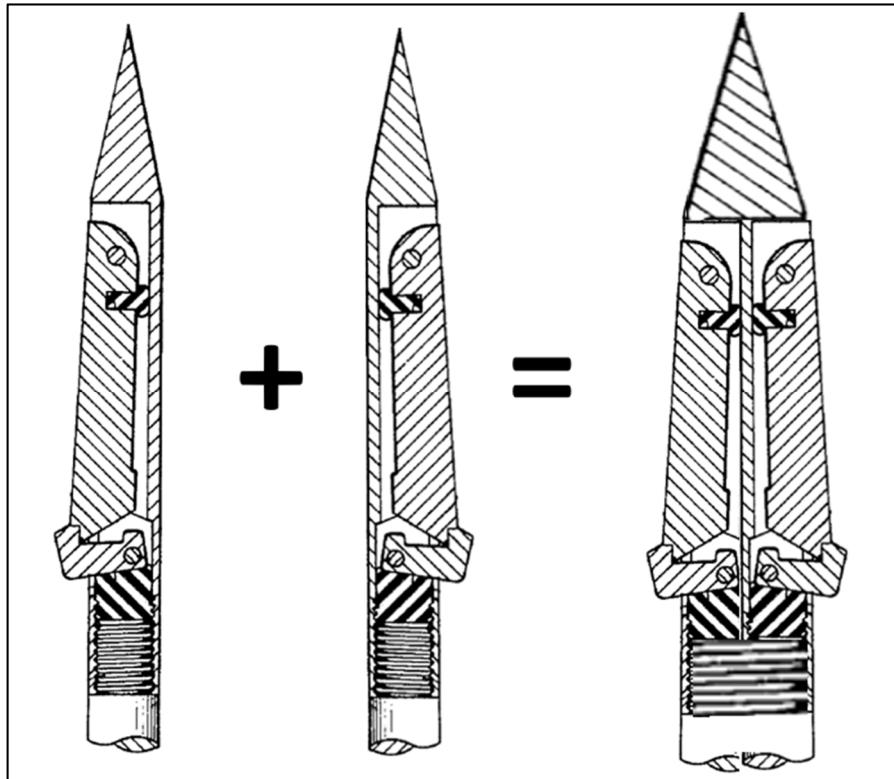
172. Hendricks discloses this requirement of claim 11. Figure 3 in Hendricks, for example, discloses that the pivotal interconnection between the first blade member and the ferrule body is at a fixed position relative to the ferrule body. Ex. 1013, Fig. 3. I include an annotated version of Figure 3 of Hendricks below.



CLAIM 11 – “a second blade member having a forward end pivotally interconnected with the ferrule body and an opposite rearward end,”

173. Although Hendricks expressly discloses a single blade member, it would have been obvious for a PHOSITA to add a second blade member by simply mirroring the single blade member assembly (*i.e.*, blade member 26, pin 28, bore 34, resilient member 36, catch 42 and resilient biasing member 44) of the broadhead of Hendricks. Implementing a second blade member assembly in broadheads similar to the broadhead disclosed in Hendricks was already routine. See for example, Ex. 1002, Figs. 2-3; Ex. 1012, Fig. 5; Ex. 1016, Fig. 14; Ex. 1018, Figs. 1-3; Ex. 1020, Figs. 3-4. A PHOSITA would understand that it would have been an obvious variation of Hendricks to add a second blade member assembly. As demonstrated by

the modified figures below, by simply adding a blade assembly that mirrors the first blade assembly in Figure 3 in Hendricks, a broadhead having two blade members can easily be created by a PHOSITA.



174. A PHOSITA would be motivated to add second blade member to the broadhead of Hendricks because a PHOSITA would know that adding a second blade member having the same function and configuration as the first blade member would be advantageous for several reasons. First, a PHOSITA would know that adding a second blade member would increase the cutting surface of the broadhead and thus make the broadhead more lethal.

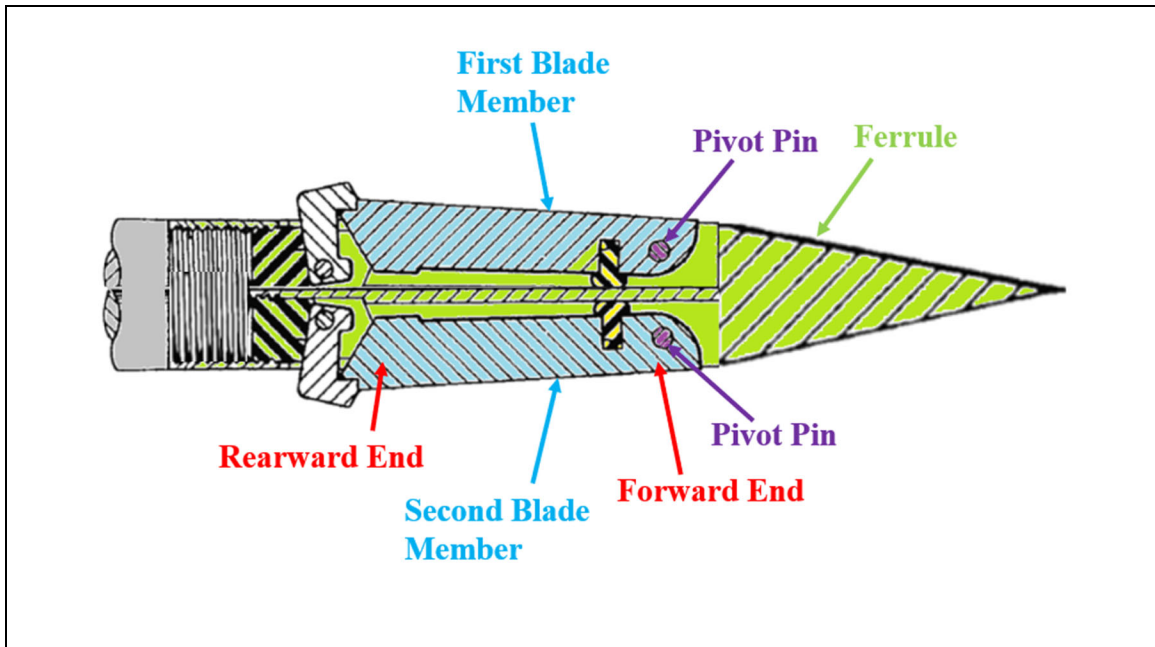
175. Second, a PHOSITA would know that adding a second blade member would improve the aerodynamics of the broadhead of Hendricks. A PHOSITA would know that for aerodynamic reasons, it is important to have an arrowhead that is balanced along a centerline axis of the ferrule. Adding a second blade member to Hendricks would be preferred because it would evenly balance the arrowhead.

176. Furthermore, any PHOSITA would know how to arrange a second blade member on the opposite side of the broadhead in the same manner that the first blade member is arranged. In my opinion, modifying the broadhead of Hendricks to include a second blade member would be simple and straightforward. No skill or ingenuity would be required to construct such a broadhead given the teachings of Hendricks and the knowledge of a PHOSITA. A PHOSITA would know how to design and make a broadhead with two blade members, and it is obvious that anyone knowing how to design and make a broadhead would know how to mirror a second blade member opposite the first blade member in the Hendricks broadhead. A PHOSITA would know that adding a second blade member to the broadhead in Hendricks would have been predictable and would not result in a new or unexpected result.

177. For reference, I include modified and annotated versions of Figures 3 and 4 of Hendricks below. The Figures demonstrate how easy it is to modify the broadhead to include a second blade member. The Figures show the broadhead

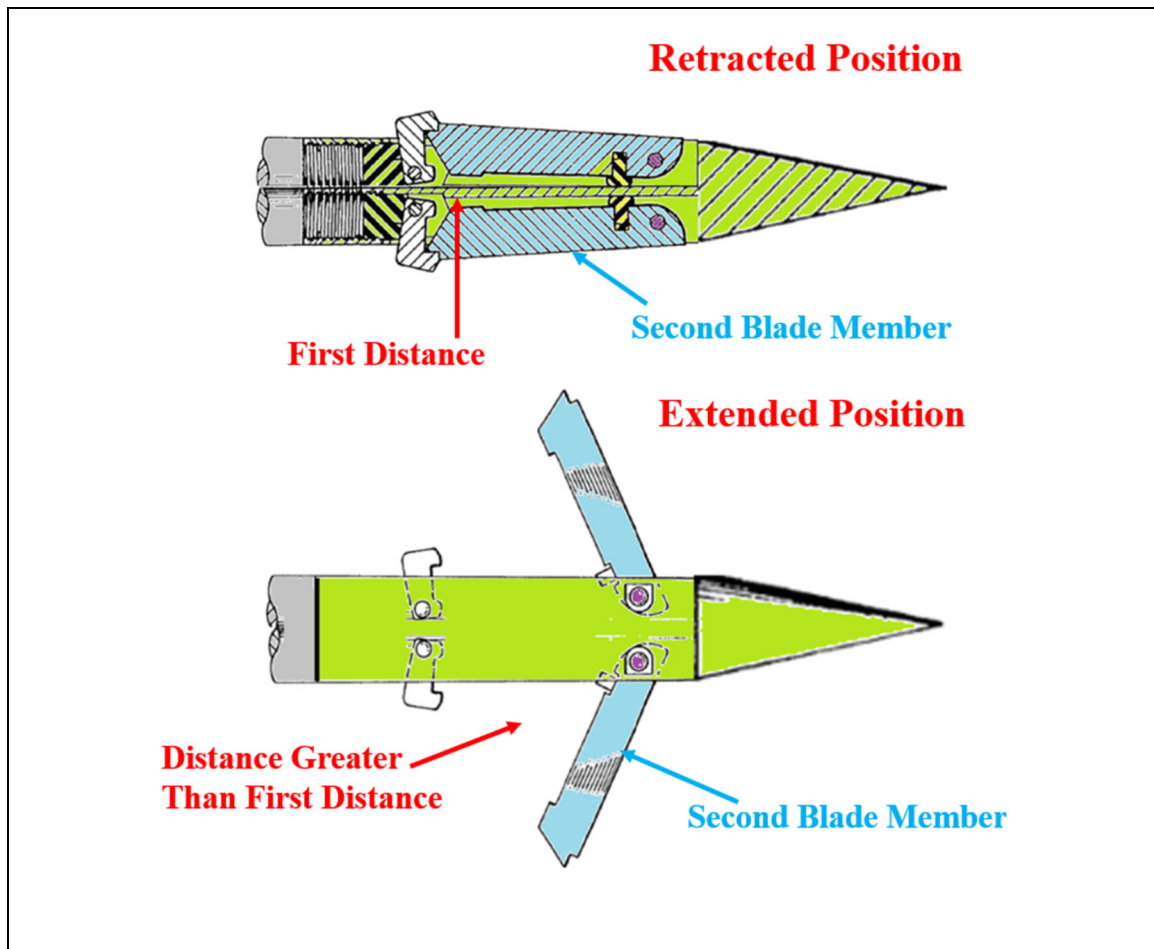
having a second blade member with a forward end pivotally interconnected with the ferrule body and an opposite rearward end. In my opinion, such a broadhead would be easy to construct given the teachings of Hendricks and the knowledge of a PHOSITA. As explained above, a PHOSITA would know (1) that the additional, second blade member is a mere duplication of the first blade member, (2) the second blade member would have the same function and configuration as the first blade member, and (3) the advantages to adding the second blade member to the broadhead in Hendricks.¹⁵

¹⁵ Further, as explained in Paragraphs 149-154 above, the plain and ordinary language of the claim does not require that the “second blade member” contain a sharp edge. There is no express language in the claims for such a requirement, and there is no disclosure in the specification or prosecution history that would restrict or otherwise require that the “second blade member” contain a sharp edge. However, it would have been obvious to a PHOSITA to simply to add a sharp edge to the second blade member disclosed in Hendricks because a PHOSITA would know that sharp edges facilitate expeditious cutting of flesh, expedited hemorrhaging which ultimately leads to humane discharge of game animals while greatly enhancing the aerodynamic flight characteristics of broadheads. Such practices date back some 15,700 years, when the earliest of ancient arrowheads have been documented in primitive fishing and hunting activities. An exemplar of an ancient fish point (a.k.a., an arrowhead) is shown in Ex. 1014.



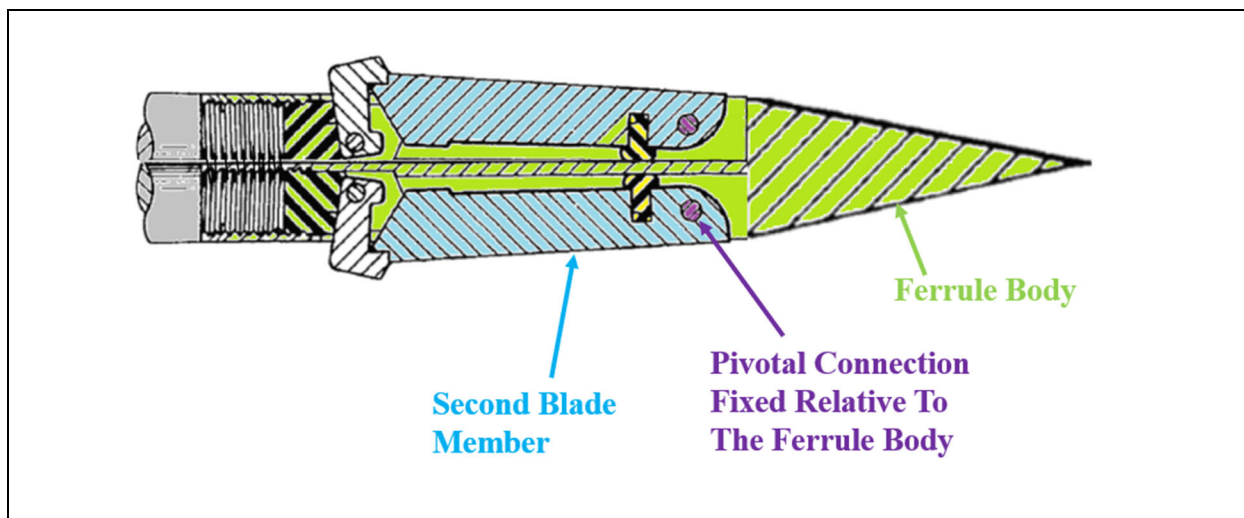
CLAIM 11 – “the second blade member having a retracted position wherein the rearward end is spaced from the ferrule body at a first distance and an extended position wherein the rearward end is spaced from the ferrule body by a distance which is greater than the first distance,”

178. As explained above, it would have been obvious for a PHOSITA to add a second blade member to the broadhead disclosed in Hendricks. For reference, I include modified and annotated versions of Figures 3 and 4 of Hendricks below. The Figures show that the space between the second blade member and the ferrule body is greater when the second blade member is in an extended position.



CLAIM 11 – “the pivotal interconnection between the second blade member and the ferrule body being at a fixed position relative to the ferrule body; and”

179. As explained above, it would have been obvious for a PHOSITA to add a second blade member to the broadhead disclosed in Hendricks. For reference, I include modified and annotated versions of Figures 3 and 4 of Hendricks showing that the pivotal interconnection between the second blade member and the ferrule body is at a fixed position relative to the ferrule body.

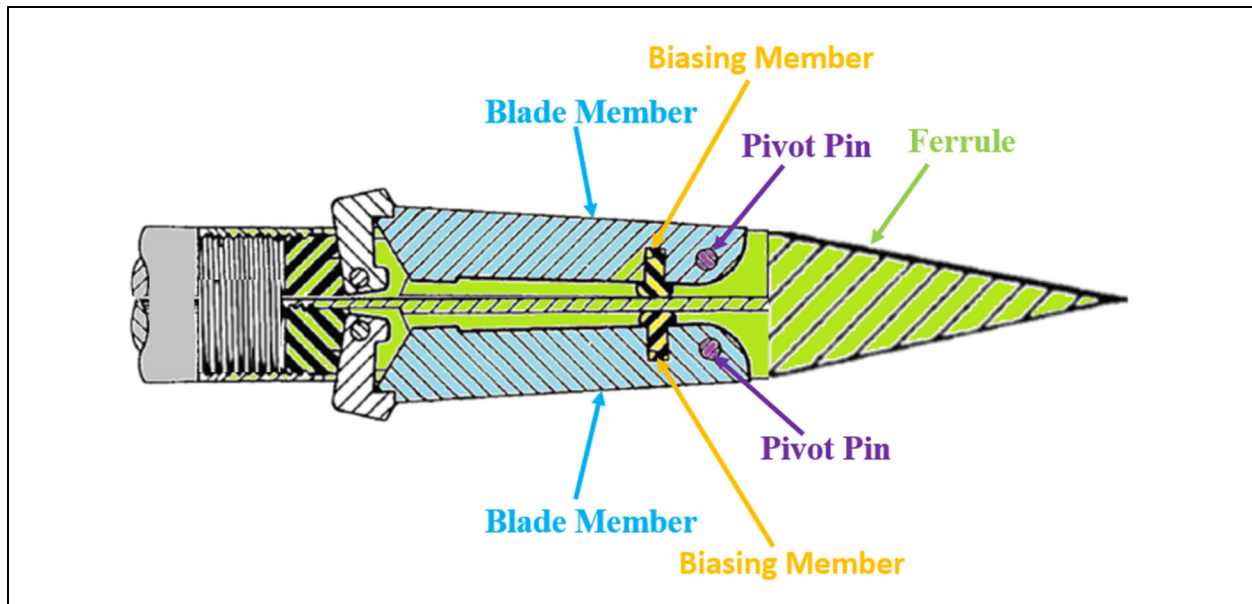


CLAIM 11 – “at least one biasing member biasing the first and second blade members towards the extended positions.”

180. Hendricks discloses: “A resilient member 36, preferably of a rubber composition, is pressed into bore 34 and includes an end portion which projects beyond inner face 32 of barb 26 and which compressingly engages base part 18 of body section 12 when barb 26 is in its closed position.” Ex. 1013, 2:26-31. Hendricks discloses: “When the weapon head enters a target, projection 42 of catch 38 engages a portion of the target and is pivoted rearwardly with respect to body section 12 causing the disengagement of lip 40 of the catch from insert part 31 of the barb. Barb 26 is then forced outwardly from its closed position by resilient member 36.” Ex. 1013, 3:1-6.

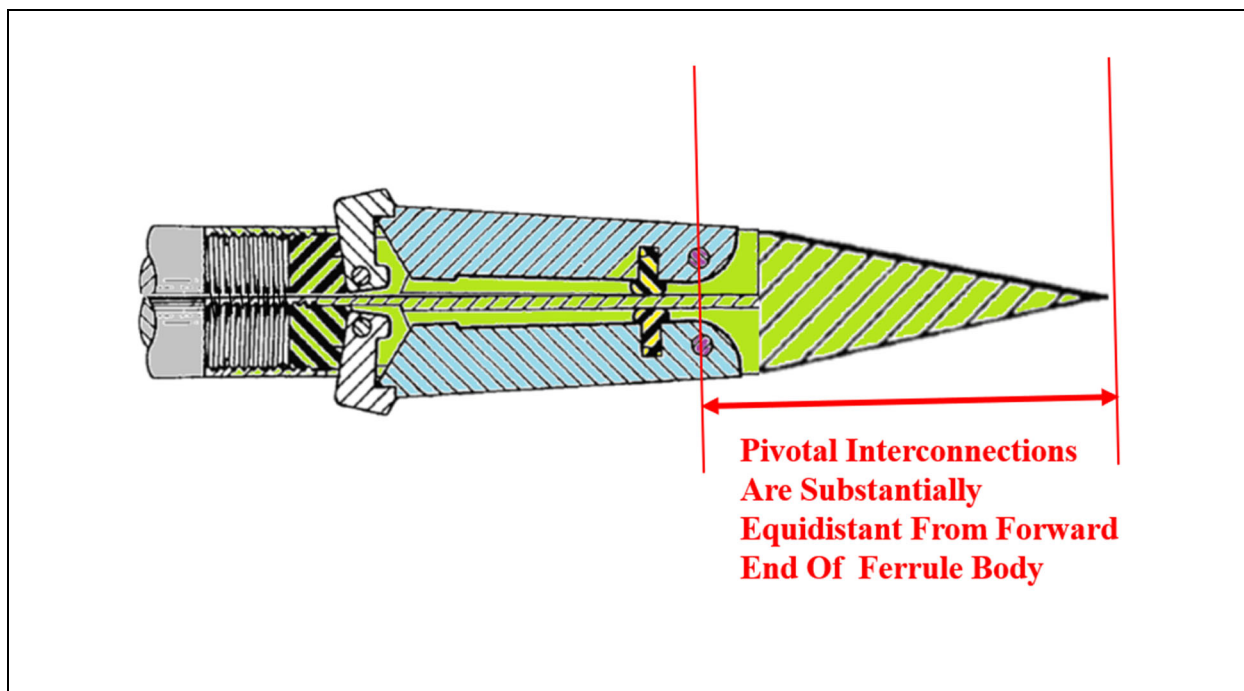
181. As explained above, it would have been obvious for a PHOSITA to add a second blade member to the broadhead disclosed in Hendricks. For reference, I

include a modified and annotated version of Figure 3 of Hendricks below. The Figure shows that the resilient members bias the first and second blade members towards the extended positions.



CLAIM 12 – “wherein: the pivotal interconnection between the first blade member and the ferrule body and the pivotal interconnection between the second blade member and the ferrule body are substantially equidistant from the forward end of the ferrule.”

182. For the same reasons as stated above, it would have been obvious for a PHOSITA to add a second blade member to the broadhead disclosed in Hendricks. For reference, I include a modified and annotated version of Figure 3 of Hendricks below. The Figure shows that the pivotal interconnections between the first blade member and the ferrule body and between the second blade member and the ferrule body are substantially equidistant from the forward end of the ferrule.

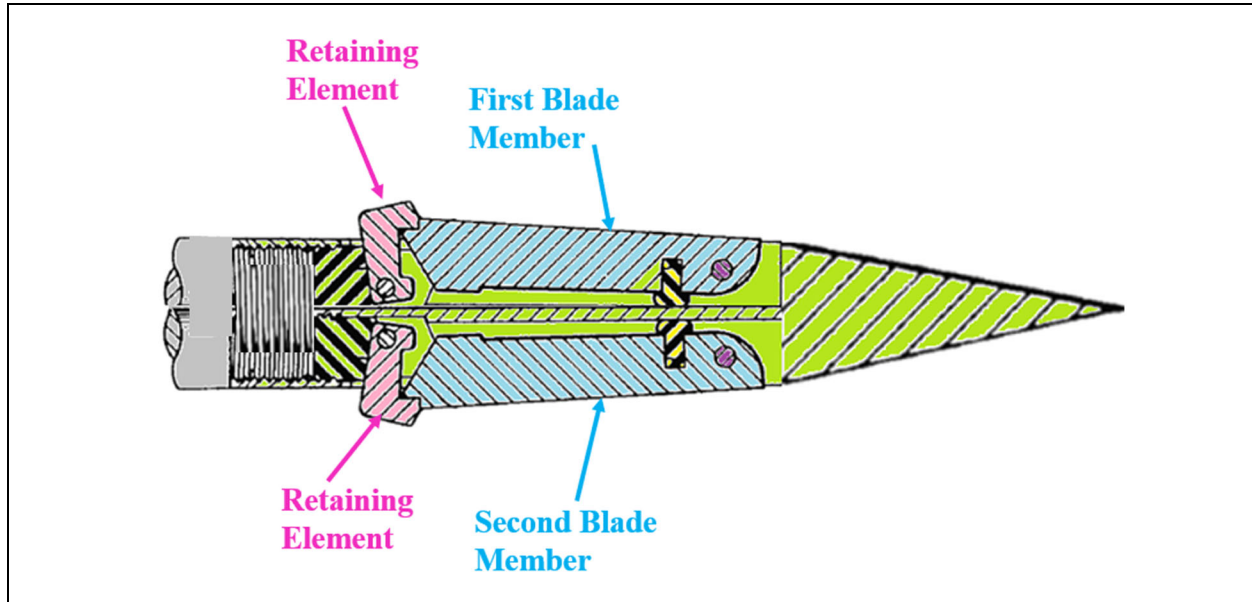


CLAIM 15 – “a retaining element engaging the blade members to maintain the blade members in the retracted position.”

183. Hendricks discloses: “A catch 38 is disposed within longitudinal slot 14 of body section 12 and is preferably positioned adjacently rearward of barb 26. Catch 38 is connected at one end to body section 12, preferably by a transverse pin 40, so as to be pivotal in a fore and aft direction within slot 14. The free end of catch 38 includes a lip 40 which is adapted to engage an inset part or shoulder 31 of barb outer side face 33 and retain barb 26 in its closed position.” Ex. 1013, 2:35-44.

184. For the same reasons stated above, it would have been obvious for a PHOSITA to add a second blade member to the broadhead disclosed in Hendricks.

For reference, I include a modified and annotated version of Figure 3 of Hendricks below. The Figure shows that the catch, or retaining mechanism, on each blade member engages the blade members to maintain the blade members in the retracted position.



CLAIM 17 – “wherein: the biasing member is a coil spring.”

185. Hendricks discloses: “A resilient member 36, preferably of a rubber composition, . . . which compressingly engages base part 18 of body section 12 when barb 26 is in its closed position.” Ex. 1013, 2:26-31. Hendricks discloses: “When the weapon head enters a target, projection 42 of catch 38 engages a portion of the target and is pivoted rearwardly with respect to body section 12 causing the disengagement of lip 40 of the catch from insert part 31 of the barb. Barb 26 is then forced outwardly from its closed position by resilient member 36.” Ex. 1013, 3:1-6.

186. Even though Hendricks does not expressly disclose the use of a coil spring as the resilient member, or biasing member, to bias the blades toward an expanded position, it would have been obvious to a PHOSITA to use a coiled spring in the broadhead of Hendricks. The use of coiled springs in broadheads like that disclosed in Hendricks was already routine, and a PHOSITA would understand that it would have been an obvious variation of Hendricks to use a coiled spring as a biasing member. By way of example, U.S. Patent No. 6,830,523 demonstrates that a coiled spring was a known alternative to the resilient rubber composition disclosed in Hendricks for biasing blades in broadheads. Ex. 1018, 6:22-32. Moreover, myriad prior art references utilize coiled springs to bias blades in an extended position. See for example, Ex. 1002, 2:53-58 (“A spring 24 . . . operates to bias the barbs 19 in the open position illustrated by FIGURE 2.”); Ex. 1003, 3:63-66 (“Biasing element 36 may comprise any suitable element or material for urging ball bearing 34 toward notch 24, such as, for example, a conventional spring-steel compression spring, or an elastomeric material such as rubber or the like. However, skilled artisans will recognize that other methods of urging ball bearing 34 toward notch 24 can be utilized without departing from the principles of the present invention.”); Ex. 1011, 4:16-19 (“blades 188 are forced outwardly by the spring 180 causing the injury and making arrowhead 100 more efficient, and as efficient as a broadhead, with minimal flight interference.”); Ex. 1012, 12:16-18

(“annular spring 80 drives or continually urges cutting edge 54 of each blade 50 in a forward direction, further slicing uncut or unpenetrated tissue.”); Ex. 1015, 3:8-11 (“barbs are actuated by a sliding plug 51 in a bore 52 extended from the socket 50 and the plug 51 is urged against cam surfaces 53 of the barbs 54 and 55 by a spring”); Ex. 1016, 15:36-48 (“A spring (48) is provided in the area between the plug (46) and piston (43), and tends to constantly urge the piston (43) forward When the moveable cutting blades (44) are rotated outwardly relative to the body section (1a) to a position at or near full deployment, the cut-out areas (45) accommodate the forward movement of the piston (43) into such areas (45); restraining the moveable cutting blades (44) from retraction inward toward the body section (1a).”); Ex. 1017, 2:17-23 (“a spring member 32, which has its ends pivoted in openings formed in the barb members 28, acts to swing the barbs out through the wall apertures or slots 19 and into the position shown in FIG. 1. A coil spring 33 acts between the inner end of the point member shank 16 and the outer end of the barb carrier 23 for urging the latter to and holding it in the position shown in FIG. 1.”).

187. Furthermore, in my opinion, any PHOSITA would readily understand how to arrange a coiled spring to function as a biasing member in the broadhead of Hendricks. No skill or ingenuity would be required to implement a coiled spring given the teachings of Hendricks and the knowledge of a PHOSITA. Using a coiled

spring as the biasing member would have been predictable and would not result in a new or unexpected result.

E. Ground V: Liechty, II Discloses Every Limitation of Claims 1-4, 9, 11, 12, and 17

188. I have compared claims 1-4, 9, 11, 12, and 17 to Liechty, II. It is my opinion that the Liechty, II discloses each and every limitation of claims 1-4, 9, 11, 12, and 17. Below, I address each claim limitation.

Claim 1 of '177 Patent	Liechty, II
A broadhead for an arrow having a shaft, the broadhead comprising:	Liechty, II discloses an “arrowhead 20 attached to the forward end of the arrow shaft 18.” Ex. 1012, 10:26-36.
a ferrule having a rearward end configured for attachment to the shaft and an opposite forward end with a ferrule body extending therebetween;	Liechty, II discloses an “arrowhead body 20.” Ex. 1012, 10:32, Fig. 5. Figure 5 in Liechty, II shows the arrowhead body 20 having a rearward end configured for attachment to the shaft and an opposite forward end. I include an annotated version of Figure 5 in Paragraph 190 below.
a first blade member having a first end pivotally interconnected with the ferrule body and an opposite second end,	Liechty, II discloses “blades 50 pivotally connected to an arrowhead body 30.” Ex. 1012, 10:32 and Fig. 5. Figure 5 in Liechty, II shows a first blade member having a first end pivotally interconnected with the ferrule body and an opposite second end. I include an annotated version of Figure 5 in Paragraph 191 below.

Claim 1 of '177 Patent	Liechty, II
the first blade member having a retracted position wherein the second end is spaced from the ferrule body at a first distance and an extended position wherein the second end is spaced from the ferrule body by a distance which is greater than the first distance;	Liechty, II discloses: “As illustrated in FIG. 5 . . . annular spring 80 drives or continually urges cutting edge 54 of each blade 50 in a forward direction, further slicing uncut or unpenetrated tissue.” Ex. 1012, 12:14-18; Fig. 5. In other words, Figure 5 of Liechty, II illustrates how the space between the first blade member and the ferrule body would become greater when the first blade member is urged forward by the annular spring 80. Ex. 1002, Fig. 5. I include modified and annotated versions of Figure 5 in Paragraph 192 below.
a second blade member having a first end pivotally interconnected with the ferrule body and an opposite second end	Liechty, II discloses “blades 50 pivotally connected to an arrowhead body 30.” Ex. 1012, 10:32 and Fig. 5. Figure 5 in Liechty, II shows a second blade member having a first end pivotally interconnected with the ferrule body and an opposite second end. I include an annotated version of Figure 5 in Paragraph 193 below.
the [second] blade member having a retracted position wherein the second end is spaced from the ferrule body at a first distance and an extended position wherein the second end is spaced from the ferrule body by a distance which is greater than the first distance; and	Liechty, II discloses: “As illustrated in FIG. 5 . . . annular spring 80 drives or continually urges cutting edge 54 of each blade 50 in a forward direction, further slicing uncut or unpenetrated tissue.” Ex. 1012, 12:14-18; Fig. 5. In other words, Figure 5 of Liechty, II illustrates how the space between the second blade member and the ferrule body would become greater when the second blade

Claim 1 of '177 Patent	Liechty, II
	member is urged forward by the annular spring 80. Ex. 1002, Fig. 5. I include modified and annotated versions of Figure 5 in Paragraph 194 below.
at least one biasing member biasing the first and second blade members towards the extended positions, the biasing member being the only element operable to hold the blade members in the extended position.	Liechty, II discloses that an “ annular spring 80 drives or continually urges cutting edge 54 of each blade 50 in a forward direction, further slicing uncut or unpenetrated tissue. ” Ex. 1012, 12:16-18; Fig. 5. Liechty, II discloses embodiments where the annular spring is the only element operable to hold the blade members in the extended position. Ex. 1012, 8:61-65. I include an annotated version of Figure 5 in Paragraph 195 below.

Claim 2 of the '177 Patent	Liechty, II
A broadhead in accordance with claim 1, wherein: the pivotal interconnection between the first blade member and the ferrule body is at a fixed position relative to the ferrule body; and the pivotal interconnection between the second blade member and the ferrule body being at a fixed position relative to the ferrule body.	As shown in Figure 5 of Liechty, II, the pivotal interconnections between the first blade member and the ferrule body and between the second blade member and the ferrule body are fixed position relative to the ferrule body. Ex. 1012, Fig. 5. I include an annotated version of Figure 5 in Paragraph 196 below.

Claim 3 of '177 Patent	Liechty, II
A broadhead in accordance with claim 2, wherein: the pivotal interconnection between the first blade member and the ferrule body and the pivotal	As shown in Figure 5 of Liechty, II, the pivotal interconnections between the first blade member and the ferrule body and between the second

Claim 3 of '177 Patent	Liechty, II
interconnection between the second blade member and the ferrule body are substantially equidistant from the forward end of the ferrule.	blade member and the ferrule body are substantially equidistant from the forward end of the ferrule. Ex. 1012, Fig. 5. I include an annotated version of Figure 5 in Paragraph 197 below.

Claim 4 of '177 Patent	Liechty, II
A broadhead in accordance with claim 1, wherein: the first ends of the first and second blade members are forward ends and the second ends are rearward ends.	As shown in Figure 5 in Liechty, II, the first ends of the first and second blade members are forward ends and the second ends are rearward ends. Ex. 1012, Fig. 5. I include an annotated version of Figure 2 in Paragraph 198 below.

Claim 9 of '177 Patent	Liechty, II
A broadhead in accordance with claim 1, wherein: the biasing member is a coil spring.	Liechty, II discloses that “ annular spring 80 drives or continually urges cutting edge 54 of each blade 50 in a forward direction , further slicing uncut or unpenetrated tissue.” (Ex. 1012, 12:16-18; Fig. 5.

Claim 11 of '177 Patent	Liechty, II
A broadhead for an arrow having a shaft, the broadhead comprising:	Liechty, II discloses an “ arrowhead 20 attached to the forward end of the arrow shaft 18. ” Ex. 1012, 10:26-36.
a ferrule having a rearward end configured for attachment to the shaft and an opposite forward end with a ferrule body extending therebetween,	Liechty, II discloses an “ arrowhead body 20. ” Ex. 1012, 10:32, Fig. 5. Figure 5 of Liechty, II shows that the arrowhead body 20 has a rearward end configured for attachment to the

Claim 11 of '177 Patent	Liechty, II
	shaft and an opposite forward end. I include an annotated version of Figure 5 of in Paragraph 190 below.
the forward end of the ferrule defining the forward tip of the arrow and being fixed with respect to the ferrule body;	Liechty, II discloses that a “tip end 32 may be removably attachable to a substantially frustuconical arrow head body 30, as clearly shown in FIG. 2, or may be integral with arrowhead body 30, as shown in FIG. 9.” Ex. 1012, 15:40-43.
a first blade member having a forward end pivotally interconnected with the ferrule body and an opposite rearward end,	Liechty, II discloses: “blades 50 pivotally connected to an arrowhead body 30.” Ex. 1012, 10:32, Fig. 5. As shown in Figure 5 in Liechty, II, the first blade member has a forward end pivotally interconnected with the ferrule body and an opposite rearward end. I include an annotated version of Figure 5 in Paragraph 191 below.
the first blade member having a retracted position wherein the rearward end is spaced from the ferrule body at a first distance and an extended position wherein the rearward end is spaced from the ferrule body by a distance which is greater than the first distance,	Liechty, II discloses: “As illustrated in FIG. 5 . . . annular spring 80 drives or continually urges cutting edge 54 of each blade 50 in a forward direction, further slicing uncut or unpenetrated tissue.” Ex. 1012, 12:14-18; Fig. 5. In other words, Figure 5 of Liechty, II illustrates how the space between the first blade member and the ferrule body would become greater when the first blade member is urged forward by the annular spring 80. Ex. 1002, Fig. 5. I include modified and annotated versions of Figure 5 in Paragraph 192 below.

Claim 11 of '177 Patent	Liechty, II
the pivotal interconnection between the first blade member and the ferrule body being at a fixed position relative to the ferrule body;	As shown in Figure 5 of Liechty, II, the pivotal interconnection between the first blade member and the ferrule body is fixed position relative to the ferrule body. Ex. 1012, Fig. 5. I include an annotated version of Figure 5 in Paragraph 196 below.
a second blade member having a forward end pivotally interconnected with the ferrule body and an opposite rearward end,	Liechty, II discloses: “blades 50 pivotally connected to an arrowhead body 30.” Ex. 1012, 10:32, Fig. 5. As shown in Figure 5 in Liechty, II, the second blade member has a forward end pivotally interconnected with the ferrule body and an opposite rearward end. I include an annotated version of Figure 5 in Paragraph 193 below.
the second blade member having a retracted position wherein the rearward end is spaced from the ferrule body at a first distance and an extended position wherein the rearward end is spaced from the ferrule body by a distance which is greater than the first distance,	Liechty, II discloses: “As illustrated in FIG. 5 . . . annular spring 80 drives or continually urges cutting edge 54 of each blade 50 in a forward direction, further slicing uncut or unpenetrated tissue.” Ex. 1012, 12:14-18; Fig. 5. In other words, Figure 5 of Liechty, II illustrates how the space between the second blade member and the ferrule body would become greater when the second blade member is urged forward by the annular spring 80. Ex. 1002, Fig. 5. I include modified and annotated versions of Figure 5 in Paragraph 194 below.

Claim 11 of '177 Patent	Liechty, II
the pivotal interconnection between the second blade member and the ferrule body being at a fixed position relative to the ferrule body; and	As shown in Figure 5 of Liechty, II, the pivotal interconnection between the first blade member and the ferrule body is fixed position relative to the ferrule body. Ex. 1012, Fig. 5. I include an annotated version of Figure 5 in Paragraph 196 below.
at least one biasing member biasing the first and second blade members towards the extended positions.	Liechty, II discloses: “annular spring 80 drives or continually urges cutting edge 54 of each blade 50 in a forward direction, further slicing uncut or unpenetrated tissue.” Ex. 1012, 12:16-18; Fig. 5.

Claim 12 of '177 Patent	Liechty, II
A broadhead in accordance with claim 11, wherein: the pivotal interconnection between the first blade member and the ferrule body and the pivotal interconnection between the second blade member and the ferrule body are substantially equidistant from the forward end of the ferrule.	Figure 5 of Liechty, II, shows that the pivotal interconnections between the blade members and the ferrule body are substantially equidistant from the forward end of the ferrule. Ex. 1012, Fig. 5 I include an annotated version of Figure 5 in Paragraph 197 below.

Claim 17 of '177 Patent	Liechty, II
A broadhead in accordance with claim 11, wherein: the biasing member is a coil spring.	Liechty, II discloses: “annular spring 80 drives or continually urges cutting edge 54 of each blade 50 in a forward direction, further slicing uncut or unpenetrated tissue.” Ex. 1012, 12:16-18; Fig. 5. Liechty, II discloses: “Bias means may include a single bias element urging a plurality of blades, or may be an individual bias element for each blade, or a combination thereof.

Claim 17 of '177 Patent	Liechty, II
	Bias means for example, can include, cantilevers, rubber material, certain hydraulic systems and/or filled bladder systems, and springs such as compression, coil or leaf.” Ex. 1012, 12:36-41.

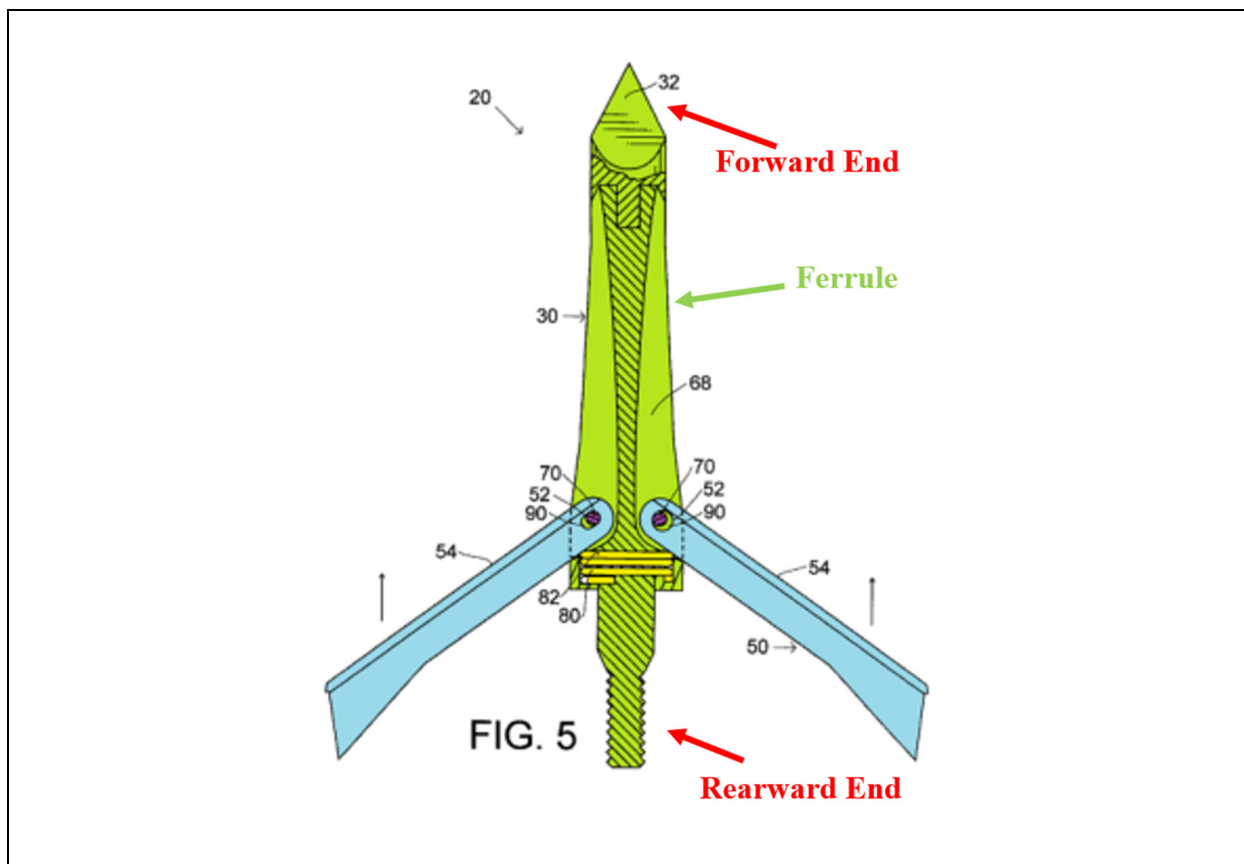
189. With regard to claims 1-4, 9, 11, 12, and 17 of the '177 patent, as can be seen in the above chart, Liechty, II discloses all the requirements of these claims. I further address these claims below.

CLAIM 1 – “A broadhead for an arrow having a shaft, the broadhead comprising:”

190. Liechty, II discloses an “arrowhead 20 attached to the forward end of the arrow shaft 18.” Ex. 1012, 10:26-36).

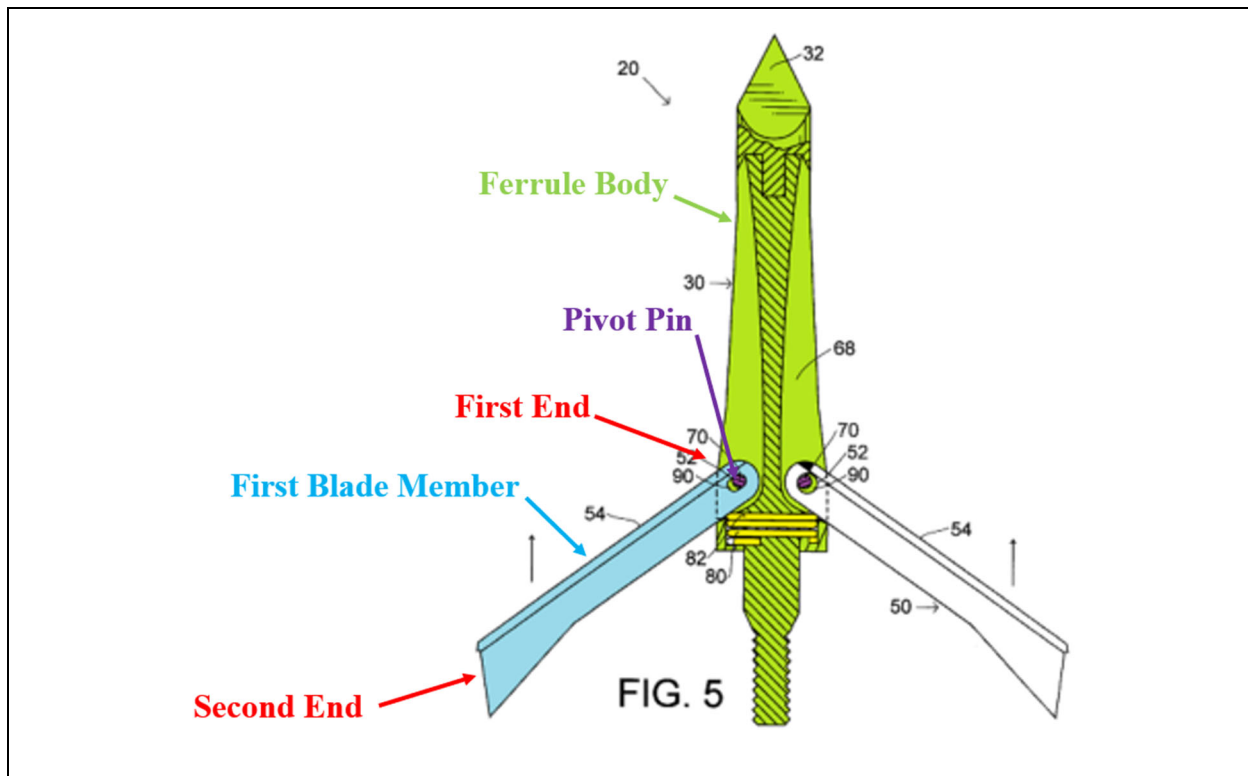
CLAIM 1 – “a ferrule having a rearward end configured for attachment to the shaft and an opposite forward end with a ferrule body extending therebetween;”

191. Liechty, II discloses this requirement of claim 1. Liechty, II discloses an “arrowhead body 20.” Ex. 1012, 10:32, Fig. 5. Figure 5 in Liechty, II shows that the arrowhead body 20 has a rearward end configured for attachment to the shaft and an opposite forward end. I include an annotated version of Figure 5 of Liechty, II below.



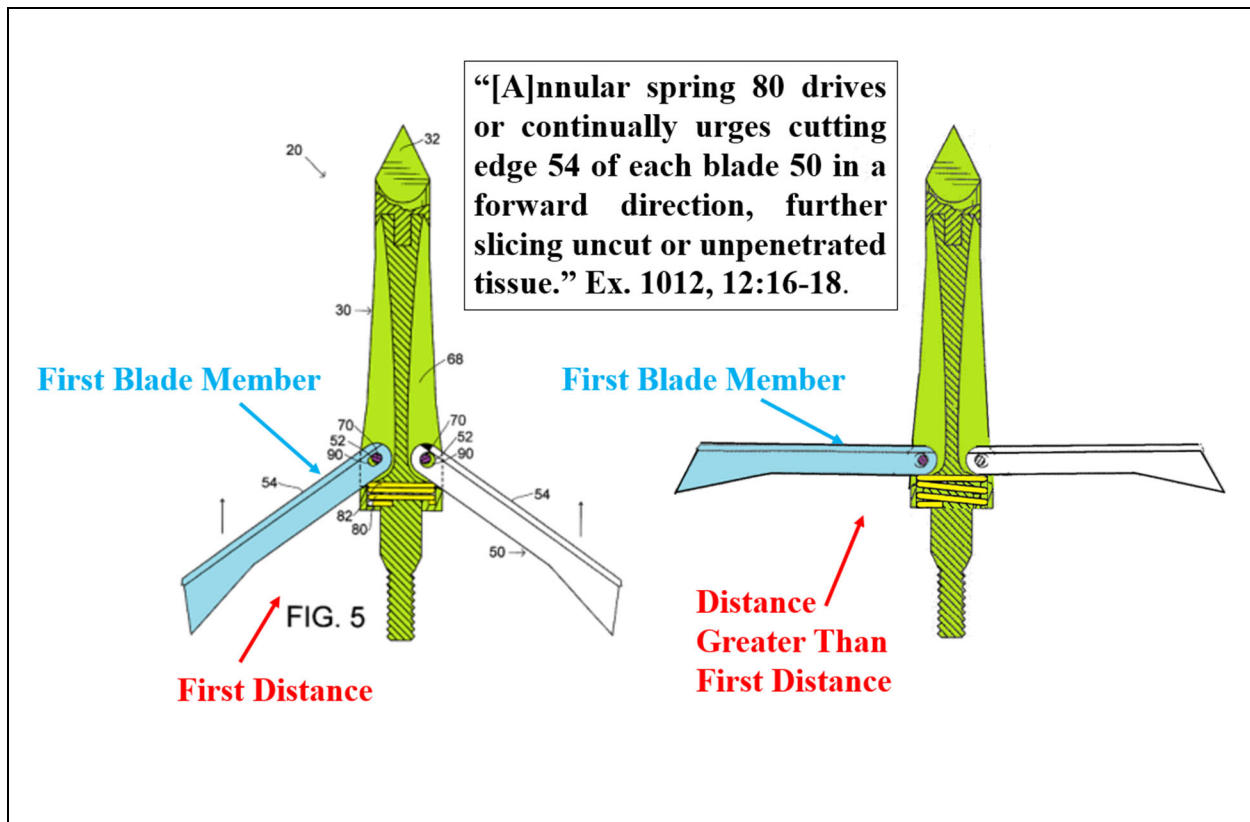
CLAIM 1 – “a first blade member having a first end pivotally interconnected with the ferrule body and an opposite second end,”

192. Liechty, II discloses this requirement of claim 1. Liechty, II discloses “blades 50 pivotally connected to an arrowhead body 30.” Ex. 1012, 10:32, Fig. 5. As shown in Figure 5 in Liechty, II, the first blade member has a first end and second end, and the first end of the blade is pivotally interconnected with the ferrule body. I include an annotated version of Figure 5 below.



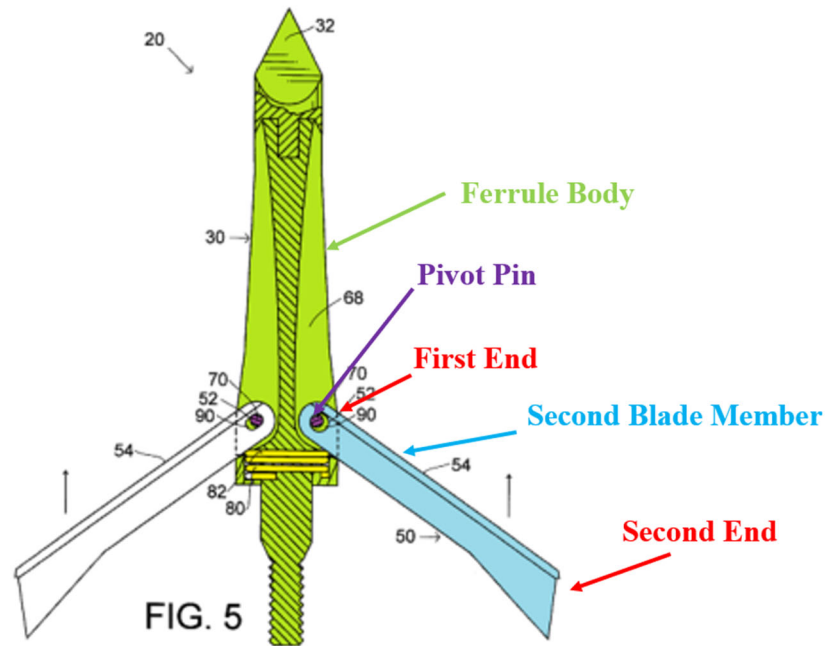
CLAIM 1 – “the first blade member having a retracted position wherein the second end is spaced from the ferrule body at a first distance and an extended position wherein the second end is spaced from the ferrule body by a distance which is greater than the first distance;”

193. Liechty, II discloses this requirement of claim 1. Liechty, II discloses: “As illustrated in FIG. 5 . . . annular spring 80 drives or continually urges cutting edge 54 of each blade 50 in a forward direction, further slicing uncut or unpenetrated tissue.” Ex. 1012, 12:14-18; Fig. 5. In other words, Figure 5 of Liechty, II illustrates how the space between the first blade member and the ferrule body would become greater when the first blade member is urged forward by the annular spring 80. Ex. 1002, Fig. 5. I include modified and annotated versions of Figure 5 below.



CLAIM 1 – “a second blade member having a first end pivotally interconnected with the ferrule body and an opposite second end,”

194. Liechty, II discloses this requirement of claim 1. Liechty, II discloses: “blades 50 pivotally connected to an arrowhead body 30.” Ex. 1012, 10:32, Fig. 5. Figure 5 in Liechty, II, shows that the second blade has a first end and second end, and the first end of the second blade is pivotally interconnected with the ferrule body. I include an annotated version of Figure 5 below.

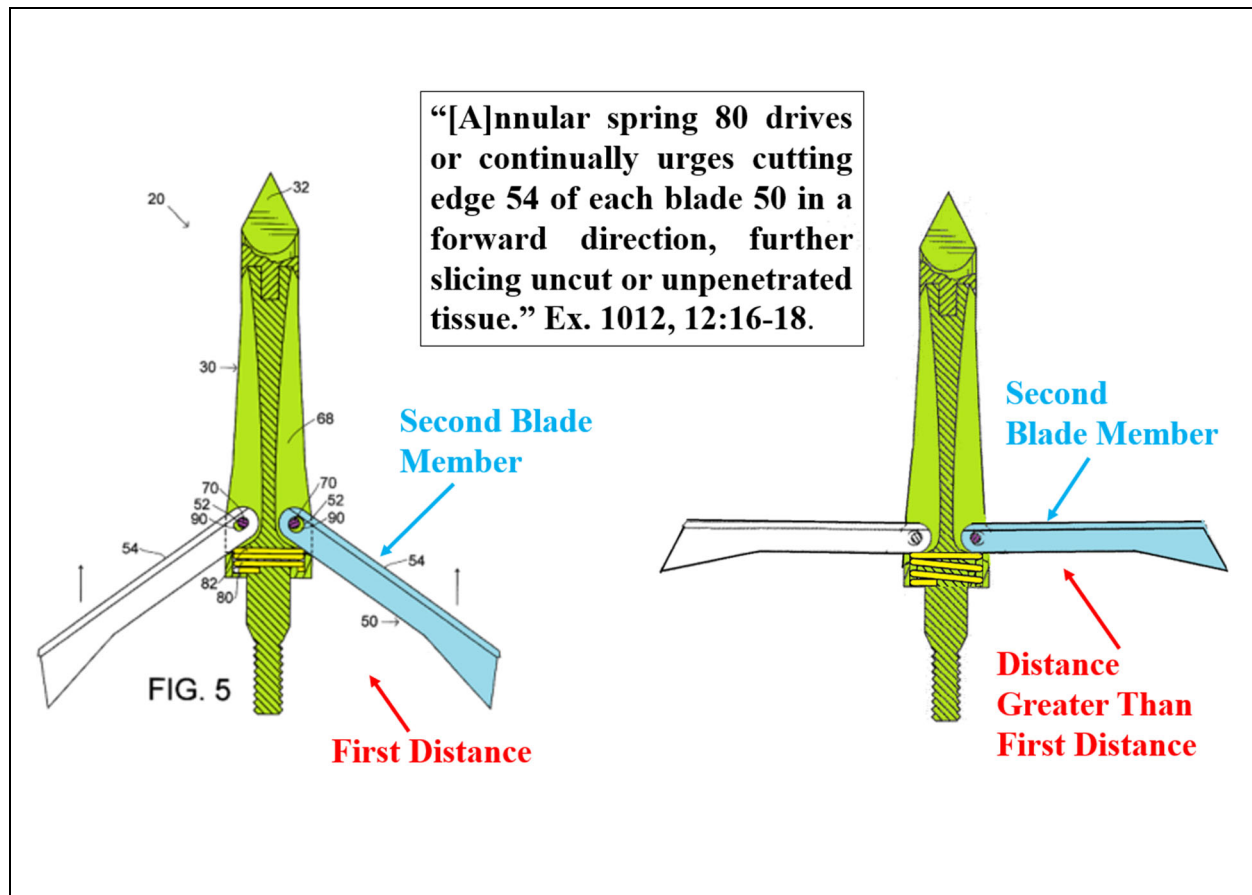


CLAIM 1 – “the [second] blade member having a retracted position wherein the second end is spaced from the ferrule body at a first distance and an extended position wherein the second end is spaced from the ferrule body by a distance which is greater than the first distance; and”

195. Liechty, II discloses this requirement of claim 1. Liechty, II discloses: “As illustrated in FIG. 5 . . . annular spring 80 drives or continually urges cutting edge 54 of each blade 50 in a forward direction, further slicing uncut or unpenetrated tissue.” Ex. 1012, 12:14-18; Fig. 5. In other words, Figure 5 of Liechty, II illustrates how the space between the second blade member and the ferrule body would become

greater when the second blade member is urged forward by the annular spring 80.

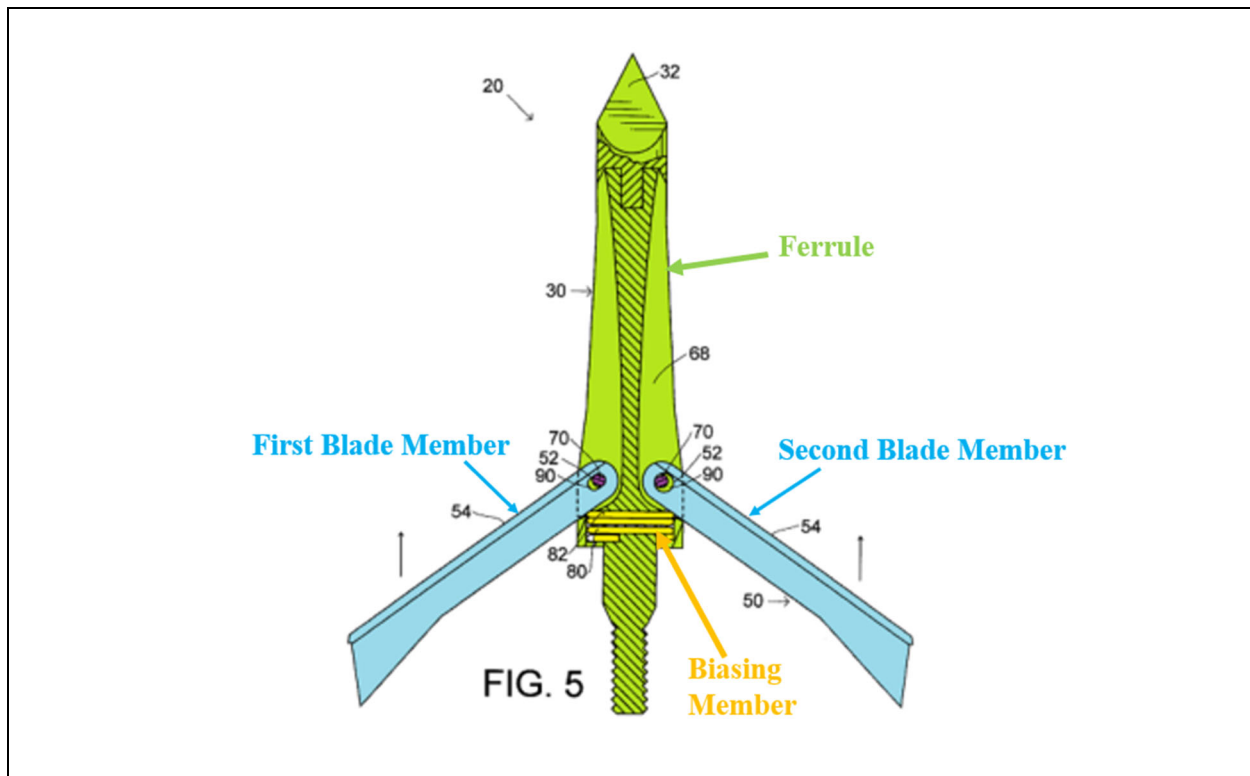
Ex. 1002, Fig. 5. I include modified and annotated versions of Figure 5 below.



CLAIM 1 – “at least one biasing member biasing the first and second blade members towards the extended positions, the biasing member being the only element operable to hold the blade members in the extended position.”

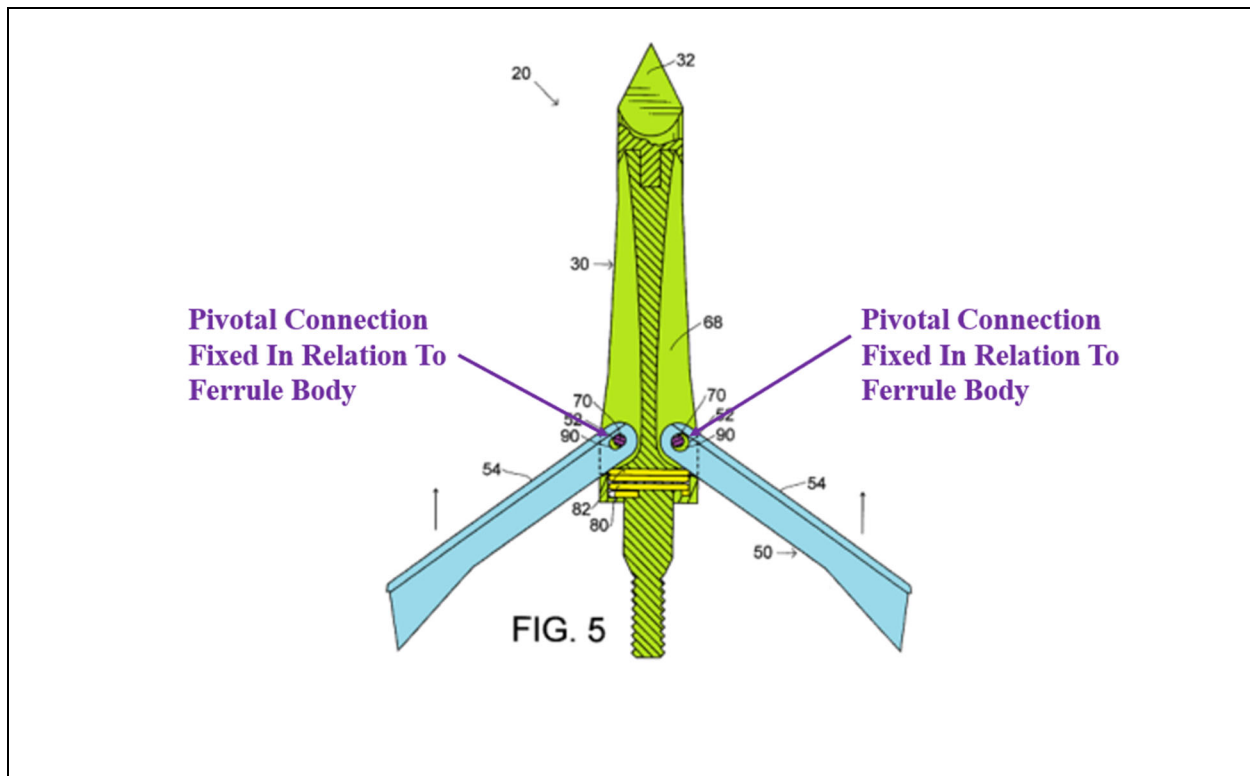
196. Liechty, II discloses this requirement of claim 1. Liechty, II discloses: “annular spring 80 drives or continually urges cutting edge 54 of each blade 50 in a forward direction, further slicing uncut or unpenetrated tissue.” Ex. 1012, 12:16-18, Fig. 5. Liechty, II discloses embodiments where the annular spring is the only

element operable to hold the blade members in the extended position. Ex. 1012, 8:61-65. I include an annotated version of Figure 5 below.



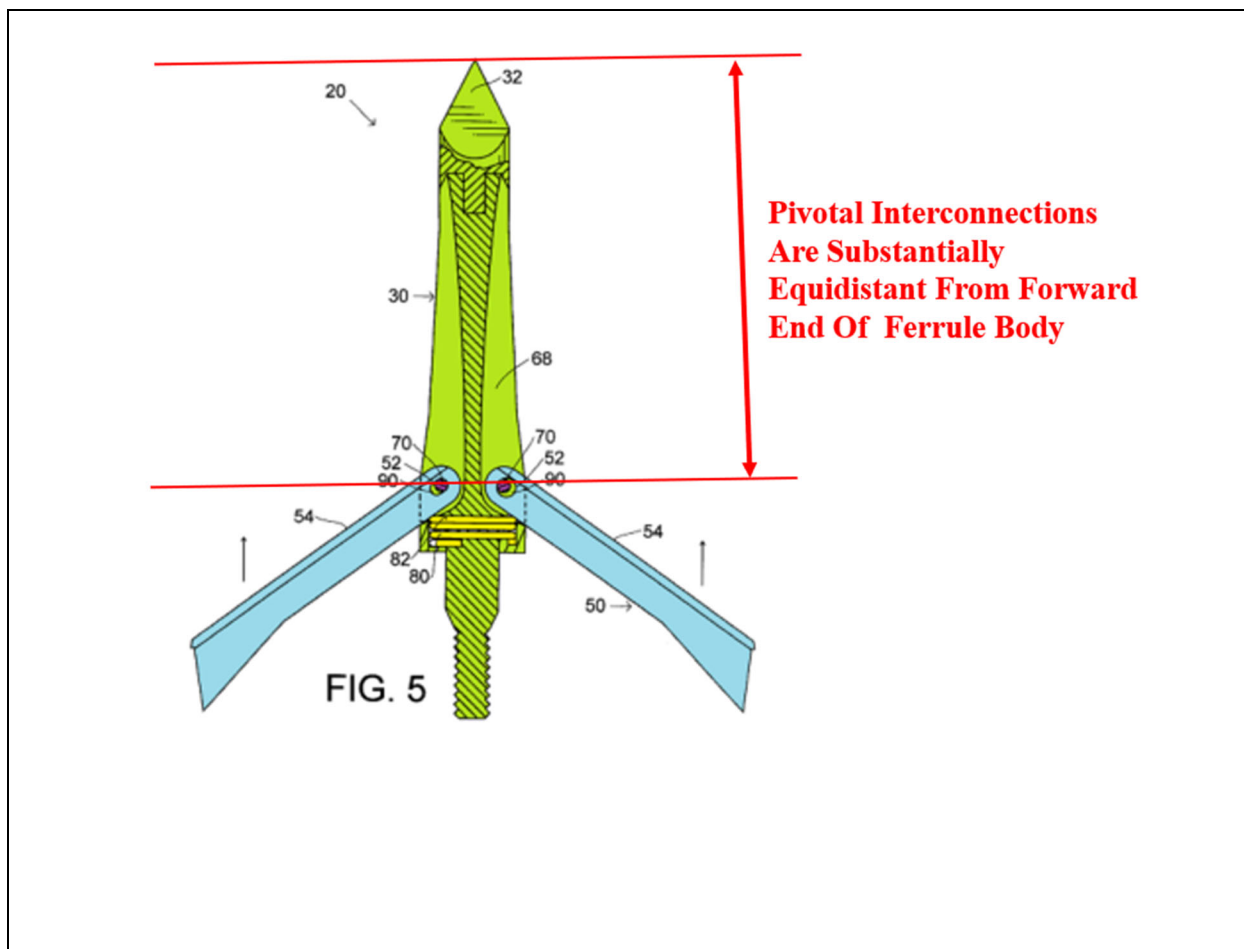
CLAIM 2 – “wherein: the pivotal interconnection between the first blade member and the ferrule body is at a fixed position relative to the ferrule body; and the pivotal interconnection between the second blade member and the ferrule body being at a fixed position relative to the ferrule body.”

197. Liechty, II discloses this requirement of claim 2. Liechty, II discloses: “blades 50 pivotally connected to an arrowhead body 30.” Ex. 1012, 10:32, Fig. 5. Figure 5 in Liechty, II, shows the pivotal interconnections between the blade members and the ferrule body are fixed position relative to the ferrule body. Ex. 1012, Fig. 5. I include an annotated version of Figure 5 below.



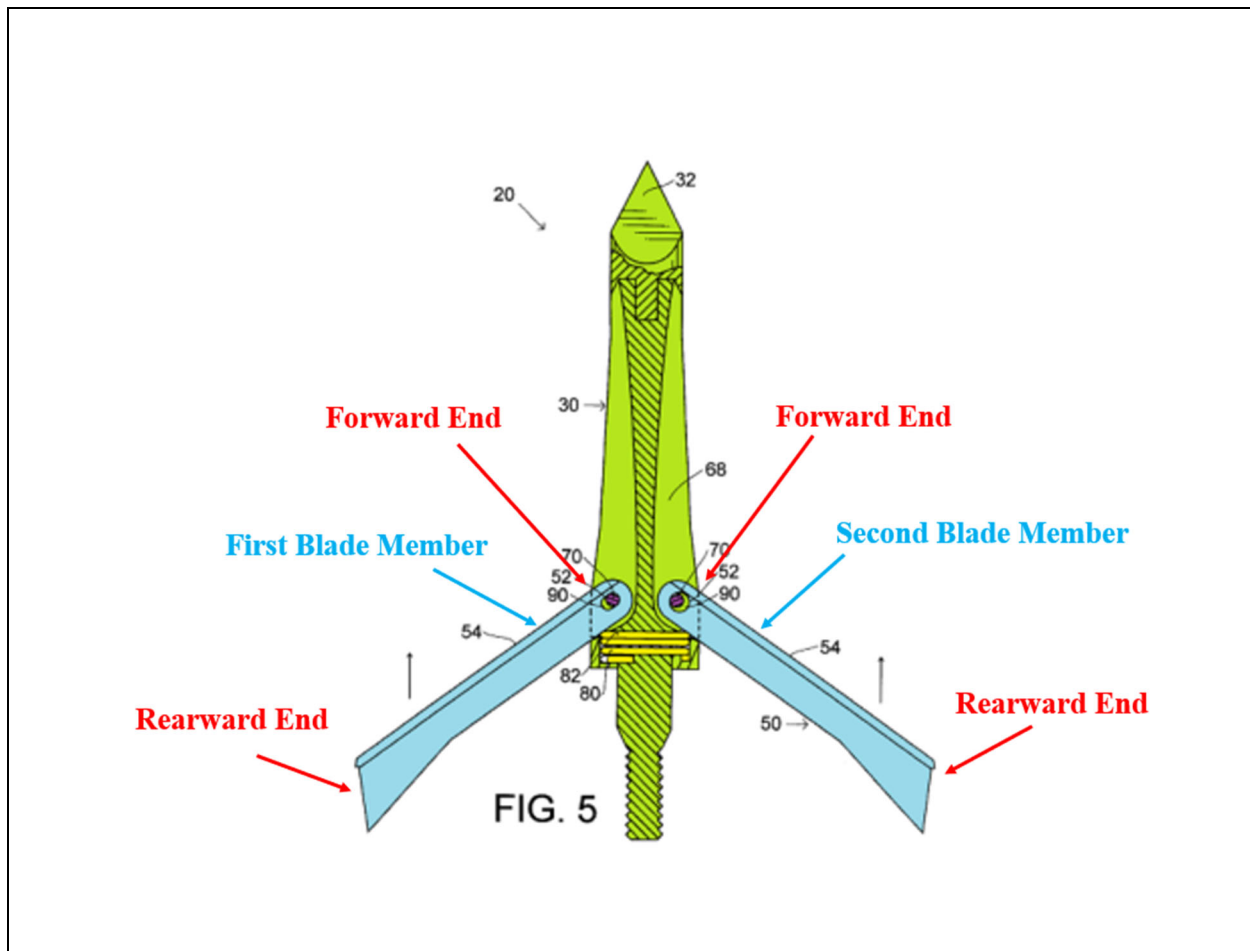
CLAIM 3 – “wherein: the pivotal interconnection between the first blade member and the ferrule body and the pivotal interconnection between the second blade member and the ferrule body are substantially equidistant from the forward end of the ferrule.”

198. Liechty, II discloses this requirement of claim 3. Figure 5 of Liechty, II shows the pivotal interconnections between the blade members and the ferrule body are substantially equidistant from the forward end of the ferrule. Ex. 1012, Fig. 5. I include an annotated version of Figure 5 below.



CLAIM 4 – “wherein: the first ends of the first and second blade members are forward ends and the second ends are rearward ends.”

199. Liechty, II discloses this requirement of claim 4. Figure 5 in Liechty, II shows that the first ends of the first and second blade members are forward ends and the second ends are rearward ends. Ex. 1012, Fig. 5. I include an annotated version of Figure 5 below.



CLAIM 9 – “wherein: the biasing member is a coil spring.”

200. Liechty, II discloses this requirement of claim 9. Liechty, II discloses that “annular spring 80 drives or continually urges cutting edge 54 of each blade 50 in a forward direction, further slicing uncut or unpenetrated tissue.” Ex. 1012, 12:16-18. Liechty, II discloses: “Bias means may include a single bias element urging a plurality of blades, or may be an individual bias element for each blade, or a

combination thereof. Bias means for example, can include, cantilevers, rubber material, certain hydraulic systems and/or filled bladder systems, and springs such as compression, coil or leaf.” Ex. 1012, 12:36-41.

CLAIM 11 – “A broadhead for an arrow having a shaft, the broadhead comprising:”

201. Liechty, II discloses an “arrowhead 20 attached to the forward end of the arrow shaft 18.” Ex. 1012, 10:26-36.

CLAIM 11 – “a ferrule having a rearward end configured for attachment to the shaft and an opposite forward end with a ferrule body extending therebetween,”

202. Liechty, II discloses this requirement of claim 11. Liechty, II discloses an “arrowhead body 20.” Ex. 1012, 10:32, Fig. 5. Figure 5 in Liechty, II shows that the arrowhead body 20 has a rearward end configured for attachment to the shaft and an opposite forward end. I include an annotated version of Figure 5 above in Paragraph 190.

CLAIM 11 – “the forward end of the ferrule defining the forward tip of the arrow and being fixed with respect to the ferrule body;”

203. Liechty, II discloses this requirement of claim 11. Liechty, II discloses that a “tip end 32 may be removably attachable to a substantially frustuconical arrow head body 30, as clearly shown in FIG. 2, or may be integral with arrowhead body 30, as shown in FIG. 9.” Ex. 1012, 15:40-43.

CLAIM 11 – “a first blade member having a forward end pivotally interconnected with the ferrule body and an opposite rearward end,”

204. Liechty, II discloses this requirement of claim 11. Liechty, II discloses: “blades 50 pivotally connected to an arrowhead body 30.” Ex. 1012, 10:32, Fig. 5. As shown in Figure 5 in Liechty, II, the first blade member has a forward end pivotally interconnected with the ferrule body and an opposite rearward end. I include an annotated version of Figure 5 above in Paragraph 191.

CLAIM 11 – “the first blade member having a retracted position wherein the rearward end is spaced from the ferrule body at a first distance and an extended position wherein the rearward end is spaced from the ferrule body by a distance which is greater than the first distance,”

205. Liechty, II discloses this requirement of claim 11. Liechty, II discloses: “As illustrated in FIG. 5 . . . annular spring 80 drives or continually urges cutting edge 54 of each blade 50 in a forward direction, further slicing uncut or unpenetrated tissue.” Ex. 1012, 12:14-18; Fig. 5. In other words, Figure 5 of Liechty, II illustrates how the space between the first blade member and the ferrule body would become greater when the first blade member is urged forward by the annular spring 80. Ex. 1002, Fig. 5. I include modified and annotated versions of Figure 5 above in Paragraph 192.

CLAIM 11 – “the pivotal interconnection between the first blade member and the ferrule body being at a fixed position relative to the ferrule body;”

206. Liechty, II discloses this requirement of claim 11. Figure 5 in Liechty, II shows that the pivotal interconnection between the first blade member and the ferrule body is fixed position relative to the ferrule body. Ex. 1012, Fig. 5. I include an annotated version of Figure 5 above in Paragraph 196.

CLAIM 11 – “a second blade member having a forward end pivotally interconnected with the ferrule body and an opposite rearward end,”

207. Liechty, II discloses this requirement of claim 11. Liechty, II discloses: “blades 50 pivotally connected to an arrowhead body 30.” Ex. 1012, 10:32, Fig. 5. As shown in Figure 5 in Liechty, II, the second blade member has a forward end pivotally interconnected with the ferrule body and an opposite rearward end. I include an annotated version of Figure 5 above in Paragraph 193.

CLAIM 11 – “the second blade member having a retracted position wherein the rearward end is spaced from the ferrule body at a first distance and an extended position wherein the rearward end is spaced from the ferrule body by a distance which is greater than the first distance,”

208. Liechty, II discloses this requirement of claim 11. Liechty, II discloses: “As illustrated in FIG. 5 . . . annular spring 80 drives or continually urges cutting edge 54 of each blade 50 in a forward direction, further slicing uncut or unpenetrated tissue.” Ex. 1012, 12:14-18; Fig. 5. In other words, Figure 5 of Liechty, II illustrates

how the space between the second blade member and the ferrule body would become greater when the second blade member is urged forward by the annular spring 80. Ex. 1002, Fig. 5. I include modified and annotated versions of Figure 5 above in Paragraph 194.

CLAIM 11 – “the pivotal interconnection between the second blade member and the ferrule body being at a fixed position relative to the ferrule body; and”

209. Liechty, II discloses this requirement of claim 11. Figure 5 in Liechty, II shows that the pivotal interconnection between the second blade member and the ferrule body is fixed position relative to the ferrule body. Ex. 1012, Fig. 5. I include an annotated version of Figure 5 above in Paragraph 196.

CLAIM 11 – “at least one biasing member biasing the first and second blade members towards the extended positions.”

210. Liechty, II discloses: “annular spring 80 drives or continually urges cutting edge 54 of each blade 50 in a forward direction, further slicing uncut or unpenetrated tissue.” Ex. 1012, 12:16-18. I include an annotated version of Figure 5 of Liechty, II above in Paragraph 195.

CLAIM 12 – “wherein: the pivotal interconnection between the first blade member and the ferrule body and the pivotal interconnection between the second blade member and the ferrule body are substantially equidistant from the forward end of the ferrule.”

211. Liechty, II discloses this requirement of claim 12. Figure 5 in Liechty, II, shows that the pivotal interconnections between the blade members and the

ferrule body are substantially equidistant from the forward end of the ferrule. Ex. 1012, Fig. 5. I include an annotated version of Figure 5 above in Paragraph 197.

CLAIM 17 – “wherein: the biasing member is a coil spring.”

212. Liechty, II discloses this requirement of claim 17. Liechty, II discloses that an “annular spring 80 drives or continually urges cutting edge 54 of each blade 50 in a forward direction, further slicing uncut or unpenetrated tissue.” Ex. 1012, 12:16-18, Fig. 5. Liechty, II discloses: “Bias means may include a single bias element urging a plurality of blades, or may be an individual bias element for each blade, or a combination thereof. Bias means for example, can include, cantilevers, rubber material, certain hydraulic systems and/or filled bladder systems, and springs such as compression, coil or leaf.” Ex. 1012, 12:36-41.

X. CONCLUSION

213. After reviewing the prior art discussed herein and the claims of the ‘177 patent, it is my opinion that a PHOSITA would understand that the prior art renders claims 1-4, 7, 9, 11, 12, 15, and 17 invalid.

XI. SIGNATURE

214. I hereby declare that all statements made in this declaration of my own personal knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the

knowledge that willful false statements and the like are punishable by fine, imprisonment, or both, under Section 1001 of Title 18 of the U.S. Code.

Executed on January 8, 2024

A handwritten signature in black ink, reading "Todd A. Kuhn". The signature is written in a cursive style with a long horizontal flourish extending to the right.

Todd A. Kuhn, Ph.D.

APPENDIX A

Professional Qualifications and Publications Authored

TODD ALAN KUHN, Ph.D.

Personal Information:

2969 Stag Court
Mims, Florida 32754
Cellular: (228) 234-3048
E-mail: drtoddkuhn@verizon.net

KUHN Relevant Expert Qualifications:

Experience

- Owned Mid-Atlantic Archery Products, LLC and 2XJ Enterprises, LLC (aka: Crimson Talon) manufacturing company which produced several patented hunting products (mechanical broadheads, fixed-blade broadheads, hybrid broadheads, cut-on-contact broadheads, field/target points, arrow rests, etc.) which were sold in *Wal-Mart, Cabela's, Bass Pro Shops, Dick's Sporting Goods, Academy Sports, Gander Mountain, Scheel's, Tractor Supply, Canadian Tire, Sport's Authority*, etc. Several products earning "Best of the Best" awards from national publications.
- Has designed several award-winning ("Best-of-the-Best," "Best New") hunting (broadheads) products which were sold world-wide.
- Has been awarded nineteen (19) United States Patent and Trademark Office (USPTO) utility patents many of which are for broadhead design.
- Has licensed numerous patents to manufacturers with products appearing at retail in, but not limited to, *Wal-Mart, Cabela's, Bass Pro Shops, Dick's Sporting Goods, Academy Sports, Gander Mountain, Scheel's, Field & Stream, Tractor Supply, Canadian Tire, Sport's Authority, Amazon.com*, etc.
- Nearly thirty-year career in outdoor industry as author/editor.
- Served as Editor of *Game & Fish (South)* magazine (2017-2023). Hunting and fishing print publication reaches 350,000+ subscribers nationwide with a monthly readership of 1.5 million. Responsible for monthly magazine build, including, but not limited to article research, assignment, editing, proofing, layout and production. Manages staff of 40+ writers/editors.
- Served as *Bowhunting Editor* of *Outdoor Life* magazine from 2001-2017.
- Author (book), "*Shooter's Bible: Guide to Bowhunting*," Skyhorse Publishing, 2013
- Has been featured on several nationally televised hunting programs. Including "*Mossy Oak's Hunting the Country*" and "*Dodge Outdoor Adventure*."

- Has attended numerous other hunting/archery industry annual trade shows Archery Trade Association (ATA); National Shooting Sports Foundation (NSSF) Shooting, Hunting, Outdoor Trade Show “SHOT Show,” Pape’s, Kinsey’s, Maurice Sporting Goods, National Archery Buyers Association (NABA) Trade Show, Nation’s Best Sports Show (NBS), Mathews Dealer’s Show, etc. as archery equipment manufacturer as well as media representative.
- Has contributed to the following publications; *Archery Business*; *Petersen’s Hunting*; *All-At-Sea*; *Bowhunting World*; *Kayak Fish*; *Saltwater Sportsmen (Gulf Editor)*; *saltwatersportmen.com (Short Strikes)*; *BASSMASTER*; *Fishing Tackle Retailer (FTR)*; *Fish Insider*; *Game & Fish*; *Gameandfishmag.com*; *outdoorlife.com (Gone Fish’in)*; *deeranddeerhunting.com*; *Game & Fish*; *Guns and Gear*; *Deer & Deer Hunting*; *Bow and Arrow Hunting*; *American Society of Safety Engineers (ASSE) “Professional Safety”*; *National Safety Council Central Florida Chapter “Safety Scene”*
- Has attended every Archery Manufacturer’s Organization (AMO) and Archery Trade Association (ATA) annual trade show from 1998 until 2021 as a media representative.
- Has designed commercially available climbing treestand, lock-on style treestands, stick ladders, ladder-style treestands and fall protection systems.
- Has provided consulting services to *Treestand Manufacturer’s Association (TMA)* members and non-members. Consulting services have included, but have not been limited to, treestand design, fall protection system design, treestand/full-body fall arrest system assembly and use instructions manuals (and sheets) and warning labels.
- Has written and produced over 300+ treestand product use and safety instruction manuals.
- Has provided product liability instructions for assembly and use for non-hunting related consumer goods.
- Co-author of the script for “*Treestand Safety: It’s Up to You*” DVD. To date, more than 30 million copies have been distributed worldwide by Oquirrh Productions, LLC, North Salt Lake, Utah. Treestand Manufacturer’s Association (TMA) members include with their treestands and full-body, fall arrest systems.
- Has hunted successfully from lock-on, ladder, climbing, and tripod (freestanding) treestands. Has hunted successfully from ground blinds and box blinds.
- Has extensive experience installing and using all forms of treestands and fall protection systems.
- Experience involving destructive testing of treestands and full-body, fall arrest safety harness systems (destructive laboratory testing).

- Has completed the Treestand Manufacturer's Association's (TMA) and Maryland Natural Resources Police's *"Treestand Accident Investigations & Reconstruction Course"* (September 2011).
- Considered expert in outdoor industry on technology and product testing.
- Began archery/bowhunting in 1966 (aged 6). Has fifty-five plus years of bowhunting experience.

Other Past/Present Professional Certifications

Extensive experience in the programmatic development, implementation, maintenance and evaluation of occupational and industrial safety and health, industrial hygiene, health physics (ionizing and non-ionizing radiation), quality assurance & engineering(QA/QE), security, environmental compliance, pollution prevention, recycling and affirmative procurement programs. Extensive experience in the implementation and administration of OSHA, NASA, EPA, VPP, NEC, NFPA, NRC, DOT and ISO compliant programs in the public, federal and private industrial, manufacturing and construction sectors.

Occupational Safety and Health Administration (OSHA) Training Institute (OTI) *Authorized Instructor for Safety and Health Standards for the Construction Industry CFR 1926*

Including, but not limited to, Subparts B through Z, OSHA Recordkeeping; Walking/Working Surfaces; Ladders/Scaffolds; Cranes; Rigging; Trenching and Shoring; Concrete; Steel Erection & Fall Protection; Fire Protection/Prevention; Electrical Safety (High/Low Voltage); Hazard Communication; Health Hazards in Construction; Personal Protective Equipment (PPE) and Confined Space Entry.

Occupational Safety and Health Administration (OSHA) Training Institute (OTI) *Authorized Instructor for Safety and Health Standards for General Industry CFR 1910*

Including, but not limited to, OSHA Recordkeeping; Walking/Working Surfaces; Bloodborne Pathogens; Electrical Safety (High/Low Voltage); Fall Protection; Scaffolding; Lockout/Tagout; Industrial Hygiene; Machine Guarding; Laboratory Safety; Chemical Hygiene; Fire Protection; Confined Space Entry; Personal Protective Equipment; Workplace Ergonomics and Human Factors.

Master Level - Certified Hazardous Materials Manager (CHMM)

(Cert. 7947 Inactive)

Certification through the Institute of Hazardous Materials Management
Rockville, Maryland

Master Level - Certified Hazard Control Manager (CHCM)

(Cert. 2575)

Certification through the International Board for Certification of Safety Managers
(IBFCSM)
Bethesda, Maryland

Registered Professional Industrial Hygienist (RPIH)

(Registry Number 03100696 Inactive)

Registered through the Association of Professional Industrial Hygienists (APIH)
Oak Ridge, Tennessee

Certified Environmental Trainer¹ (CET)

(Cert. 96568 Inactive)

Certification through the Certified Environmental Trainer Board of Examiners

Technical Specialty Area: ***Occupational Safety and Health (OSH)***

National Environmental Training Association (NETA)

Scottsdale, Arizona

Certified Environmental Trainer² (CET)

(Cert. 96568 Inactive)

Certification through the Certified Environmental Trainer Board of Examiners

Technical Specialty Area: ***Management and Transportation of Hazardous Materials and Waste (MTHMW)***

National Environmental Training Association (NETA)

Scottsdale, Arizona

Certified Healthcare Safety Professional (CHSP)

(Cert. 97751 Inactive)

Certification through the International Board for Certification of Safety Managers

(IBFCSM)

Bethesda, Maryland

Professional Safety Certification (PSC)

Certified through the National Safety Council (Central Florida Chapter)

NASA/OSHA Program Development/Administration:

Ionizing & Non-Ionizing Radiation Safety

Industrial Hygiene Program

Confined Space Entry Program

Personal Protective Equipment (PPE)

Radioisotope Use/Handling/Storage

Lockout/Tagout Program

Bloodborne Pathogens/Infectious Disease

Electrical Safety Program

Mishap/Close Call Investigation/Reporting

Materials Handling

ISO 9000/14000/31000

Recycling Program

Hazardous Waste

Biohazardous Waste

OSHA Voluntary Protection Program (VPP)

Environmental Management System (EMS)

Machine Guarding Program

Scaffolding Safety Program

Hearing Conservation Program

Working at Heights/Fall Protection

Process Safety Management (PSM)

Chemical Hygiene

QA/QC/QE Plan/Program

Biological Safety Program

Hazard Communication Program

Commercial Dive Safety Program

Emergency Procedures

Employee Health and Safety Manual

Marine/Field Operations Program

Pollution Prevention Program

Environmental Compliance Program

Mixed Waste/Hazardous/Radioactive/Biological

Facilities/Institutional Security

Risk & Opportunity (R&O) Management System

Affirmative Procurement Program

ARC Flash

- Nearly twenty (20) years' experience as a federal contractor working on the National Aeronautics and Space Administration's (NASA) manned Space Transportation System (STS) Space Shuttle program, International Space Station

(ISS) program and the manned/unmanned rocket/propulsion testing program developing, instituting, administering, managing and auditing wide-ranging industrial and occupational safety and health programs at the John F. Kennedy Space Center (KSC) (Kennedy Space Center, FL), the Stennis Space Center (SSC) (Stennis, MS) and the Michoud Assembly Facility (MAF) in Michoud, LA.

- Nearly twenty (20) years' experience as a federal contractor working on the National Aeronautics and Space Administration's (NASA) manned Space Transportation System (STS) Space Shuttle program, International Space Station (ISS) program and the manned/unmanned rocket/propulsion testing program developing, instituting, administering, managing and auditing wide-ranging industrial hygiene programs at the John F. Kennedy Space Center (KSC) (Kennedy Space Center, FL), the Stennis Space Center (SSC) (Stennis, MS) and the Michoud Assembly Facility (MAF) in Michoud, LA.
- *Administrator/Manager* of Occupational Safety and Health Administration (OSHA) certified Voluntary Protection Program (VPP) STAR WORKSITE at the NASA Stennis Space Center, Mississippi. OSHA STAR WORKSITE accreditation is only given to those worksites demonstrating the highest-level of workplace safety programs. Annual audits are performed by OSHA of these worksites to ensure continued excellence in the field of occupational safety & health and industrial hygiene.
- Served as *Director (Senior Staff)* of *Environmental Health & Safety, Industrial Hygiene, Health Physics, Reliability, Maintainability, Quality Assurance, Pollution Prevention, Affirmative Procurement, Air/Water Quality and Recycling* on the NASA Life Sciences Support Contract (LSSC) at John F. Kennedy Space Center (KSC).
- Served as *Safety Manager* (Senior Staff) on the NASA Laboratory Support Contract (LSC) at the Stennis Space Center, MS (A2R Research) (metrology/calibration/environmental support services chemistry laboratories (inorganic/organic, metals, and gas)
- Served as *Safety/Research Engineer* on the NASA Life Sciences Support Contract (LSSC) at the J.F. Kennedy Space Center (KSC).
- Served as *Safety Research Engineer/Statistician* on the NASA Safety Support Contract (SSC) at J.F. Kennedy Space Center (KSC).
- Associate Editor (college text book); McGraw-Hill College of Engineering textbook, "*Hazardous Materials Management*," 2000
- Extensive audit/auditor experience in occupational and industrial safety and health (both OSH Act (29 CFR 1910 and 29 CFR 1926) and Voluntary Protection Program (VPP), as well as NASA compliance) programmatic functions and components (including, but not limited to, fall protection, walking/working surfaces, scaffolding, occupational exposure to bloodborne pathogens, high/low voltage, confined space entry, lockout/tagout, personal protective equipment (PPE), hearing conservation, machine guarding, hazard communication, risk management, etc.). Audit functions

have also included ISO 9000 (Quality Management), 14000 (Environmental Management Systems) and 31000 (Risk Management Systems).

- Extensive audit/auditor experience in industrial hygiene programmatic functions and components (including, but not limited to, ergonomics, ionizing/non-ionizing radiation, chemical hygiene, etc.
- Extensive mishap investigation experience as administrator of National Aeronautics and Space Administration (NASA) Agency-wide Lessons Learned program. Duties included, but were not limited to, mishap investigation, mishap/accident trend analysis and statistical analysis. Agency-wide Lessons Learned were developed and disseminated across to all NASA facilities and federal contractors.
- Former Member, *Safety Awareness for Everyone Working Group* (SAFEWG) at KSC
- Former Member, *Industrial Hygiene Working Group*, Stennis Space Center, MS
- Former Member, *National Safety Council* (KSC)
- Former Member, *National Safety Council, Central Florida Chapter, Advisory Committee*
- Former Associate Member, *American Conference of Governmental Industrial Hygienist (ACGIH)*
- Former Associate Member, *Human Factors and Ergonomics Society (HFES)*
- Former Member, *National Environmental Safety and Health Training Association (NESHTA)* formerly the NETA
- Participating Member, *American Society for Testing and Materials (ASTM)* (Member #2002478)
- Voting Member, *American Society for Testing and Materials (ASTM)* F-08.18 sub-committee on treestand safety.
- J.F. Kennedy Space Center's NASA representative for the *Government-Industry Data Exchange Program (GIDEP)* focusing on increasing system's safety, reliability and readiness within the US government.
- Provided mishap/accident statistical support data during the development of the National Aeronautics and Space Administration's Agency-wide "*Mishap Reporting and Corrective Action System (MR/CAS)*."
- Provided Phase I, II, III Safety Review support for all NASA middeck locker experimental payloads manifested on STS Space Shuttle missions.
- Provided annual occupational safety and industrial hygiene support to NASA's Space Life Sciences Training Program (SLSTP).

- Has provided full-body, fall arrest safety harness design analysis to the public.
- Has authored multiple treestand safety related articles.
- Completed National Aeronautics and Space Administration's NASA Safety Training Center (NSTC) 40-Hour *Fall Protection* course.
- Completed National Aeronautics and Space Administration NASA Safety Training Center (NSTC) 40-Hour *Mishap Investigation* course.
- Completed National Aeronautics and Space Administration NASA Safety Training Center (NSTC) 40-Hour *Management Oversight Risk Tree (MORT) Based Mishap Investigation* course. Including *Human Factors in Accident Investigation* topics.
- Completed National Aeronautics and Space Administration NASA Safety Training Center (NSTC) 40-Hour *System Safety Analysis* course.
- Completed National Aeronautics and Space Administration NASA Safety Training Center (NSTC) 40-Hour *System Safety Analysis: Special Subjects* course (i.e., Failure Modes and Effects Analysis [FMEA]).
- Presented employee training on any number of safety related topics, including, but not limited to, asbestos, hazard communication, electrical safety, motor vehicle safety, laboratory safety, chemical hygiene, etc.
- Extensive knowledge of aerospace calibration and metrology systems.
- Has attended numerous national Occupational Safety and Health Administration (OSHA) sponsored safety and health, industrial hygiene symposiums, training events, seminars and conventions.

Education

Doctor of Philosophy

Environmental Engineering
College of Engineering
Columbia Southern University

Master of Arts

Audiology
College of Health
University of Central Florida

Bachelor of Arts

Audiology
College of Health
University of Central Florida

Attended/Received Professional Training in the Following Areas (Partial Listing):

Lead Paint Management	RCRA	DOT HM-181/126F
Laboratory Safety	Biomedical Mixed Waste	Bloodborne Pathogens
Indoor Air Quality (IAQ)	Fire Protection (NFPA)	Cryogenic Safety
Chemical Hygiene	Worker's Compensation	Confined Space Entry
Toxic Propellant Safety	High Pressure Gas Safety	Small Spill Safety
Respiratory Protection	Systems Safety I, II	Loss Control I/II/III
Solvent Safety	Working at Heights (Fall Protection)	Infectious Materials Mgmt.
Radiation Safety	Payload Safety Review	Hoseline Egress
Scott/Ranger Air Pack	Lockout/Tagout	Heavy Equipment Safety
Biological Safety I, II, III	Trenching/Excavations	AIDS Safety
NFPA Life Safety Code 101	Hazardous Waste Mgmt.	Workplace Ergonomics
Drug-Free Workplace	First Aid/CPR	MORT
Overhead/Gantry Cranes	Pre-Employment Screening	Clean Air Act
National Electrical Code (NEC)	FIFRA	29 CFR 1910
Gantry Crane Safety	EPCRA	NR
Machine Guarding	HMTA	SARA Title III
OSHA 200/300	NESHAP	Nat. Ambient Air Quality Standard (NAAQS)
Violence in the Workplace	ISO 9000/14000/31000	High Voltage Safety (ARC Flash)
Electrical Safety I, II, III, IV	Process Safety Management (PSM)	

Publications (Partial Listing)

2017-2023

Numerous articles/features in Game & Fish, Fishing Tackle Retailer and Fish Insider print magazines.

2017

Kuhn, Todd A. "Next in Line," Outdoor Life, February/March 2017

Kuhn, Todd A. "Tackle Test 2017," Outdoor Life, April 2017

2016

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2015

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Kuhn, Todd A. "The Broadhead Test," Outdoor Life, August 2015, pg. 44 (6 pages)

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Kuhn, Todd A. "Saline Solutions," Outdoor Life, June 2015, pg. 28-29

Kuhn, Todd A. "The Full Quiver," Outdoor Life, April 2015, pg. 63-64

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2014

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Kuhn, Todd A. *"Rule the Rooster,"* Outdoor Life, July 2014, pg. 31

Kuhn, Todd A. *"The Big Chill,"* Outdoor Life, July 2014, pg. 14, (4 pages)

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Kuhn, Todd A. *"Weight Watchers,"* Outdoor Life, October 2014, pg. 11, Bow Bonus

2013

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2012

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Kuhn, Todd A. *"Short Stuff,"* Outdoor Life, September 2012, pg. 80

Kuhn, Todd A. *"Enter the Charm'in Reel,"* Outdoor Life, pg. 36

Kuhn, Todd A. *"From Limb to Limb,"* Outdoor Life, August 2012, pg. 18 (11 pages)

Kuhn, Todd A. *"Rinehart Backyard Buck,"* Outdoor Life, May 2012, pg. 16

Kuhn, Todd A. *"Big Game Fishing,"* Outdoor Life, May 2012, pg. 20-21

Kuhn, Todd A. *"Gear, Top Shelf Quality at Bargain-Bin Prices"* Outdoor Life, March 2013, pg. 14-15

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2011

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Kuhn, Todd A. *"Fly Right,"* Outdoor Life, October 2011, pg. 80, Bow Bonus

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Kuhn, Todd A. *"Ground Truth,"* Outdoor Life, October 2011, pg. 25

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Kuhn, Todd A. *"Crossbow Shootout: 2011,"* Outdoor Life, September 2011, pg. 72 (7 pages)

Kuhn, Todd A. *"Bargain Bows,"* Outdoor Life, August 2011, pg. 72

Kuhn, Todd A. *"Improve Your Crossbow Accuracy,"* Outdoor Life, August 2011, pg. 14-15

Kuhn, Todd A. *"Old School,"* Outdoor Life, May 2011. Pg. 14-15

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Kuhn, Todd A. *"Field Tested: Tackle Test 2011,"* Outdoor Life, October 2011, pg. 67 (6 pages)

Kuhn, Todd A. *"Reach the Summit Safely,"* Outdoor Life, October 2011, pg. 76

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Kuhn, Todd A. *"Travel Right,"* Outdoor Life, June 2007, pg. 56-57

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Kuhn, Todd A. *"Luck of the Draw,"* Outdoor Life, August 2004, pg. 30

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Kuhn, Todd A. *"Tackle Test 2017: Super Rod and Reel Combos,"* Outdoorlife.com, March 11, 2017

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Kuhn, Todd A. *"Hottest Bows of 2017,"* Outdoorlife.com, January 24, 2017

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Kuhn, Todd A. *"Ultimate Hook Guide: 21 Fishing Hooks and When to Use Them,"* Outdoorlife.com, March 19, 2012

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Kuhn, Todd A. *"The Wringer: Rod Review: G.Loomis E6X,"* Outdoorlife.com, July 1, 2015

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Kuhn, Todd A. *"Bow Test 2011,"* Outdoorlife.com, April 12, 2012

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Kuhn, Todd A. *"The Wringer: Tackle Test 2015: The Best Spinning and Baitcasting Reels,"* Outdoorlife.com, March 2, 2015

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Kuhn, Todd A. *"The Wringer: Tackle Test 2015: Gear Reviews of 42 New Rods and Reels,"* Outdoorlife.com, February 23, 2015

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Kuhn, Todd A. *"The Wringer: Tackle Test 2015: Budget Rod and Reel Pairings,"* Outdoorlife.com, February 23, 2015

Kuhn, Todd A. *"The Wringer: UNO Bowhunting App for Sighting in Your Bow,"* Outdoorlife.com, February 9, 2015

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Kuhn, Todd A. *"New Bows 2015: PSE Decree HD Compound,"* Outdoorlife.com, Video Blog, January 12, 2015

Kuhn, Todd A. *"New Crossbow: Horton Storm RDX,"* Outdoorlife.com, Video Blog, January 11, 2015

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Kuhn, Todd A. *"New Bows 2015: Expedition Eccentric 7,"* Outdoorlife.com, Video Blog, January 15, 2015

Kuhn, Todd A. *"New Bows 2015: Obsession Fusion 6,"* Outdoorlife.com, Video Blog, January 15, 2015

Kuhn, Todd A. *"New Bows 2015: Elite Synergy Compound,"* Video Blog, January 15, 2015

Kuhn, Todd A. *"New Crossbow: TenPoint Stealth FX4,"* Outdoorlife.com, Video Blog, January 14, 2015

Kuhn, Todd A. *"New Crossbows: Excalibur Offspring,"* Outdoorlife.com, Video Blog, January 14, 2015

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