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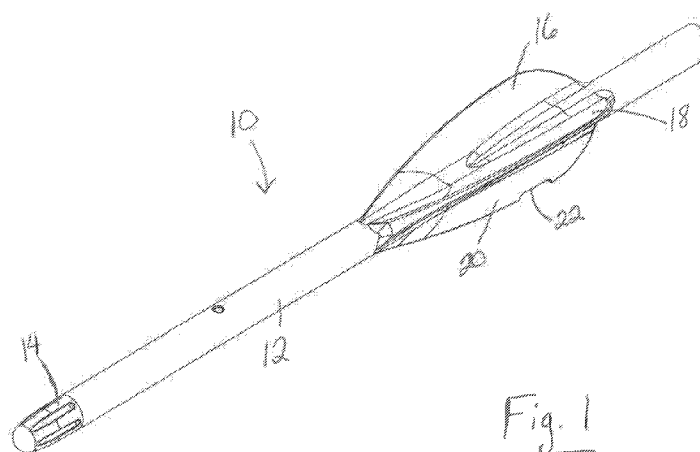
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- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

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(54) Title: CROSSBOW DISCHARGE BOLT AND METHOD



(57) Abstract: A crossbow discharge bolt for preventing damage to a crossbow associated with dry firing. The crossbow discharge bolt has a length of 10 inches or less and a weight of at least 330 grains. The length may be in the range of 6 to 10 inches. The weight may be in the range of 330 to 600 grains.

CROSSBOW DISCHARGE BOLT AND METHOD

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of a crossbow discharge bolt.

5 Fig. 2 is a top view of the crossbow discharge bolt.

Fig. 3 is a side view of the crossbow discharge bolt.

Fig. 4 is a bottom view of the crossbow discharge bolt.

Fig. 5 is a front view of the crossbow discharge bolt.

10 Fig. 6 is a cross-sectional view of the crossbow discharge bolt taken along line A—A of Fig. 5.

Fig. 7 is a perspective view of an alternate embodiment of the crossbow discharge bolt.

Fig. 8 is a front view of the crossbow discharge bolt of Fig. 7.

Fig. 9 is a side view of the crossbow discharge bolt positioned on a crossbow.

15 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Firing a crossbow without an arrow (i.e., dry firing) can damage the crossbow. However, it is sometimes desirable to discharge a crossbow without an arrow. For example, while a user may cock a crossbow at the beginning of a hunt, he or she may not fire the crossbow before ending the hunt. Accordingly, the user will need to uncock the crossbow, but he or she may not wish to fire an arrow. Prior art methods of uncocking crossbows include firing a dummy arrow, which is usually the same size as a conventional crossbow arrow. Conventional crossbow arrows are between 18 and 22 inches in length and weigh between 400 and 425 grains.

25 Figs. 1-4 illustrate crossbow discharge bolt **10** including shaft **12**, tip **14**, and fletches **16**, **18**, and **20**. Shaft **12** may be formed of a polymer or a metal. Tip **14** may be formed of steel or another metal. Fletches **16**, **18**, and **20** may be formed of a polymer. Fletch **20** may include recess **22** to distinguish fletch **20** from the other fletches **16** and **18**. Alternatively,

fletch 20 may be a different color than fletches 16 and 18. In another alternate embodiment, fletch 20 may glow in the dark. Fletch 20 may be designed to be positioned in a flight path of a crossbow track in order to appropriately orient crossbow discharge bolt 10 on a crossbow. Accordingly, crossbow discharge bolt 10 may be designed to be oriented with fletch 20 facing downward as shown in Fig. 5. As shown in Fig. 6, extension **24** of tip 14 may extend into central bore **26** of shaft 12.

In an alternate embodiment, crossbow discharge bolt 10 may include fewer than three fletches. For example, Figs. 7 and 8 illustrate crossbow discharge bolt **27** including fletches **28** and **29**.

With reference to Fig. 9, crossbow discharge bolt 10 may be placed on track **30** of crossbow **32**. A user may fire crossbow 32 with crossbow discharge bolt 10 by activating trigger **34** of crossbow 32. Crossbow discharge bolt 10 may be used to protect crossbow 32 from damage associated with dry firing when use of a conventional arrow is undesirable.

Crossbow discharge bolt 10 may have a length of 10 inches or less. Alternatively, crossbow discharge bolt 10 may have a length of 9 inches or less. In another embodiment, crossbow discharge bolt 10 may have a length of 8 inches or less. In a further embodiment, crossbow discharge bolt 10 may have a length of 7 inches or less. In one embodiment, crossbow discharge bolt 10 has a length in the range of 6 – 10 inches. Alternatively, crossbow discharge bolt 10 may have a length in the range of 7 – 9 inches. In another embodiment, crossbow discharge bolt 10 may have a length in the range of 7.5 – 8.5 inches.

Crossbow discharge bolt 10 may have a weight of at least 330 grains. Alternatively, crossbow discharge bolt 10 may have a weight of at least 400 grains. In another embodiment, crossbow discharge bolt 10 may have a weight of at least 450 grains. In a further embodiment, crossbow discharge bolt 10 may have a weight of at least 500 grains. In yet another embodiment, crossbow discharge bolt 10 may have a weight of at least 550 grains. In one embodiment, crossbow discharge bolt 10 may have a weight in the range of 330 – 600 grains. Alternatively, crossbow discharge bolt 10 may have a weight in the range of 400 – 550 grains. In another embodiment, crossbow discharge bolt 10 may have a weight in the range of 450 – 500 grains. The weight of crossbow discharge bolt 10 may be determined by the material of tip 14.

Accordingly, crossbow discharge bolt 10 may have a smaller length than conventional crossbow arrows, but may have a weight that is approximately the same as or larger than the conventional crossbow arrows. The smaller length provides added convenience to a user in transporting crossbow discharge bolt 10, but the high weight protects the crossbow by
5 allowing crossbow discharge bolt 10 to absorb the energy of the crossbow during firing.

While preferred embodiments of the present invention have been described, it is to be understood that the embodiments are illustrative only and that the scope of the invention is to be defined solely by the appended claims when accorded a full range of equivalents, many variations and modifications naturally occurring to those skilled in the art from a review
10 hereof.

CLAIMS:

1. A crossbow discharge bolt comprising a tip attached to a front end of a shaft and one or more fletches attached to a middle portion of the shaft, wherein the crossbow discharge bolt has a length of 10 inches or less and a weight of at least 330 grains.
- 5 2. The crossbow discharge bolt of claim 1, wherein the crossbow discharge bolt has a length of 9 inches or less.
3. The crossbow discharge bolt of claim 1, wherein the crossbow discharge bolt has a length of 8 inches or less.
- 10 4. The crossbow discharge bolt of claim 1, wherein the crossbow discharge bolt has a length of 7 inches or less.
5. The crossbow discharge bolt of claim 1, wherein the crossbow discharge bolt has a length in the range of 6 to 10 inches.
6. The crossbow discharge bolt of claim 1, wherein the crossbow discharge bolt has a length in the range of 7 to 9 inches.
- 15 7. The crossbow discharge bolt of claim 1, wherein the crossbow discharge bolt has a length in the range of 7.5 to 8.5 inches.
8. The crossbow discharge bolt of claim 1, wherein the crossbow discharge bolt has a weight of at least 400 grains.
- 20 9. The crossbow discharge bolt of claim 1, wherein the crossbow discharge bolt has a weight of at least 450 grains.
10. The crossbow discharge bolt of claim 1, wherein the crossbow discharge bolt has a weight of at least 500 grains.
11. The crossbow discharge bolt of claim 1, wherein the crossbow discharge bolt has a weight of at least 550 grains.
- 25 12. The crossbow discharge bolt of claim 1, wherein the crossbow discharge bolt has a weight in the range of 330 grains to 600 grains.

13. The crossbow discharge bolt of claim 1, wherein the crossbow discharge bolt has a weight in the range of 400 grains to 550 grains.

14. The crossbow discharge bolt of claim 1, wherein the crossbow discharge bolt has a weight in the range of 450 grains to 500 grains.

5 15. The crossbow discharge bolt of claim 1, wherein the tip includes an extension extending into a central bore of the shaft.

16. The crossbow discharge bolt of claim 1, wherein one of the fletches includes a recess.

10 17. The crossbow discharge bolt of claim 1, wherein one of the fletches is formed of a glow in the dark material.

18. A method of uncocking a crossbow, comprising the steps of:

a) providing a crossbow discharge bolt comprising a tip attached to a front end of a shaft and one or more fletches attached to a middle portion of the shaft, wherein the crossbow discharge bolt has a length of 10 inches or less and a weight of at least 330 grains;

15 b) positioning the crossbow discharge bolt on a track of the crossbow with the crossbow in a cocked position; and

c) firing the crossbow with the crossbow discharge bolt by activating a trigger of the crossbow.

19. The method of claim 18, wherein the crossbow discharge bolt has a length of 9
20 inches or less.

20. The method of claim 18, wherein the crossbow discharge bolt has a length of 7 inches or less.

21. The method of claim 18, wherein the crossbow discharge bolt has a weight of at least 400 grains.

25 22. The method of claim 18, wherein the crossbow discharge bolt has a weight of at least 550 grains.

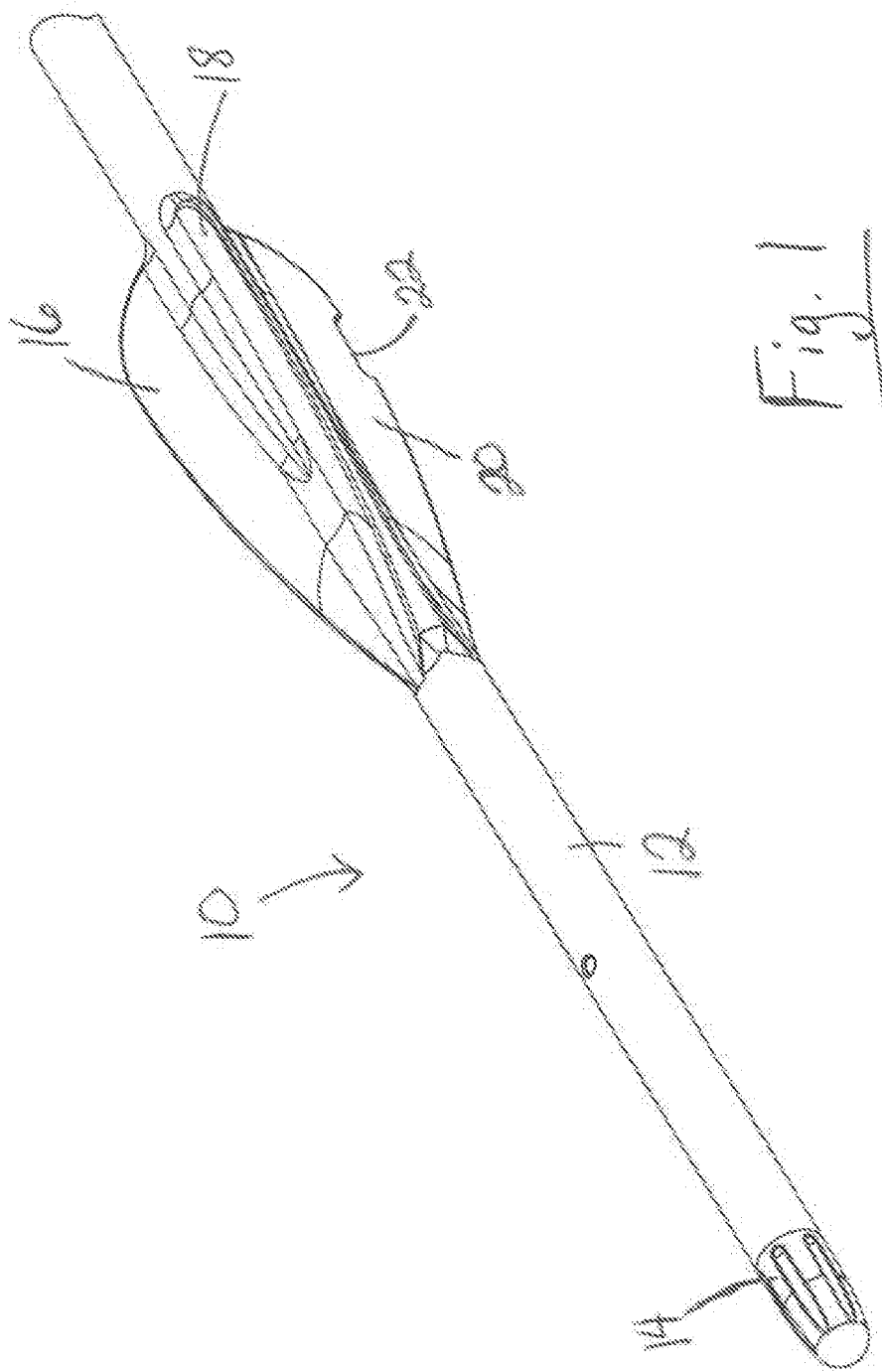


Fig. 1

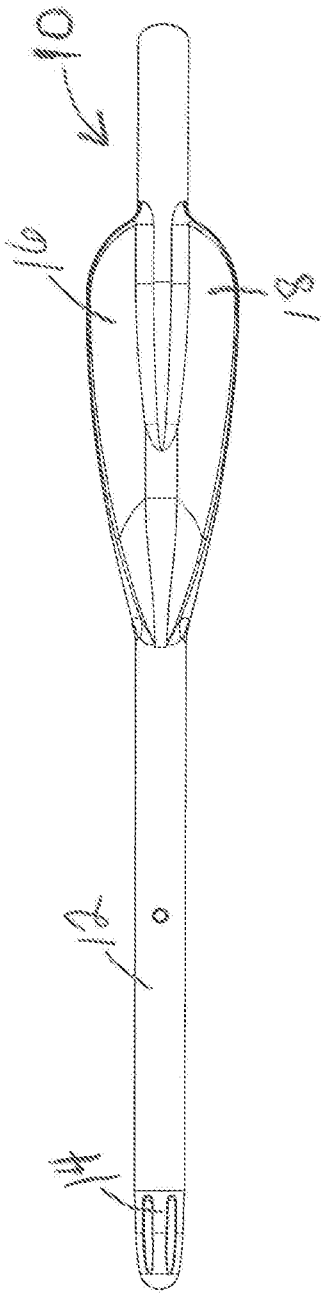


Fig. 2

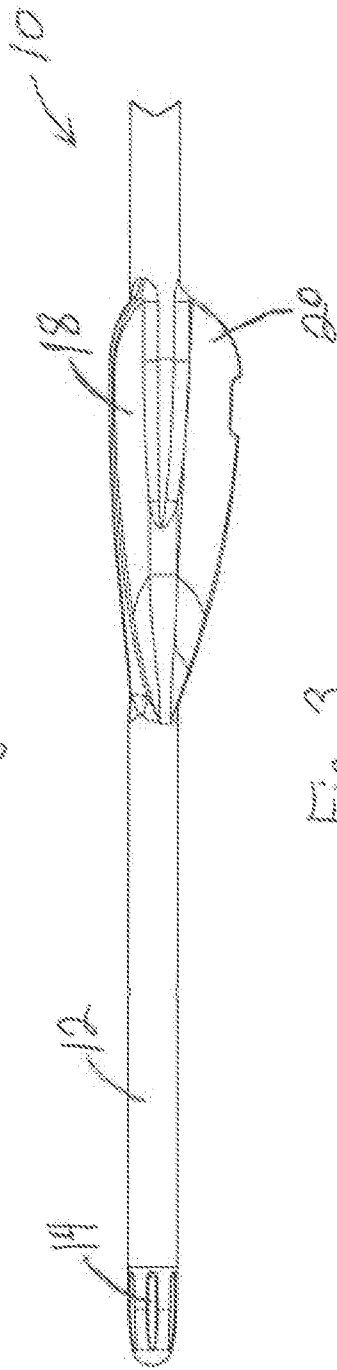


Fig. 3

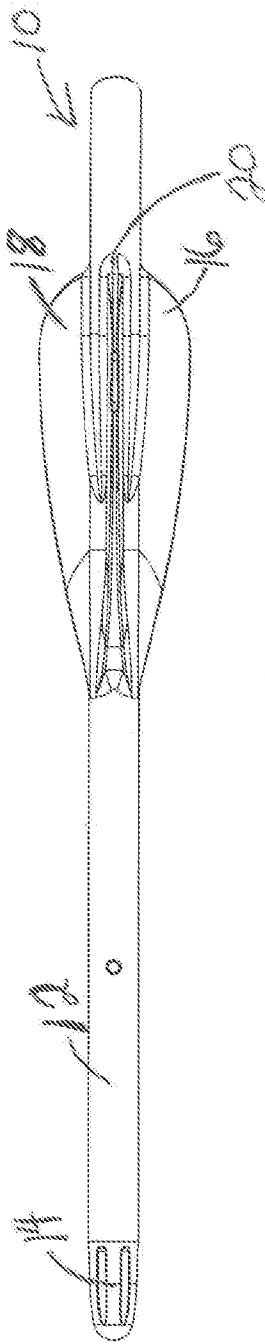


Fig. 4

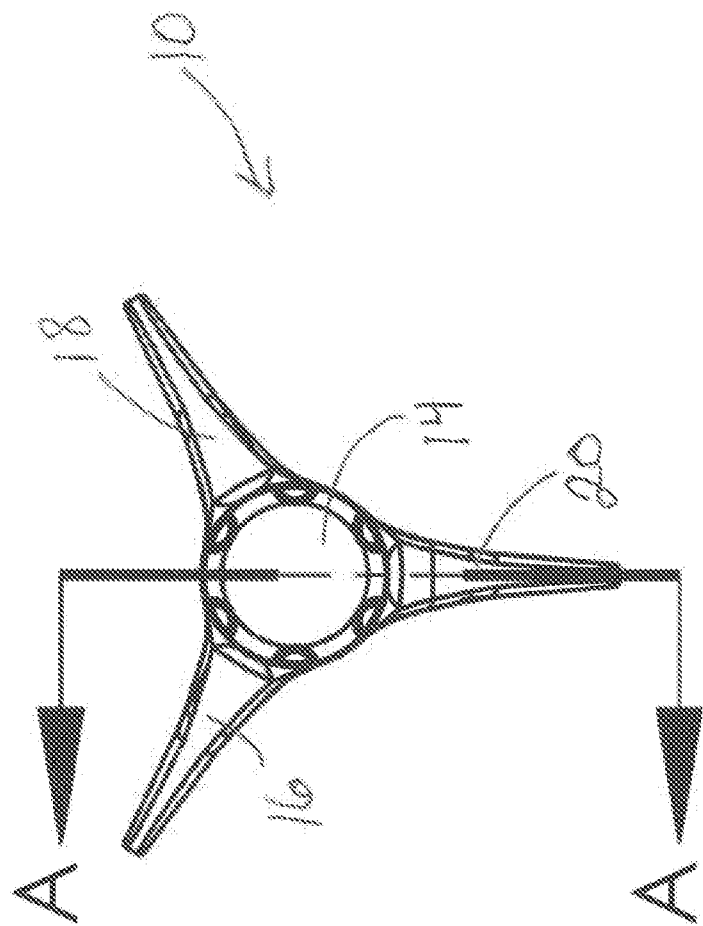


Fig. 5

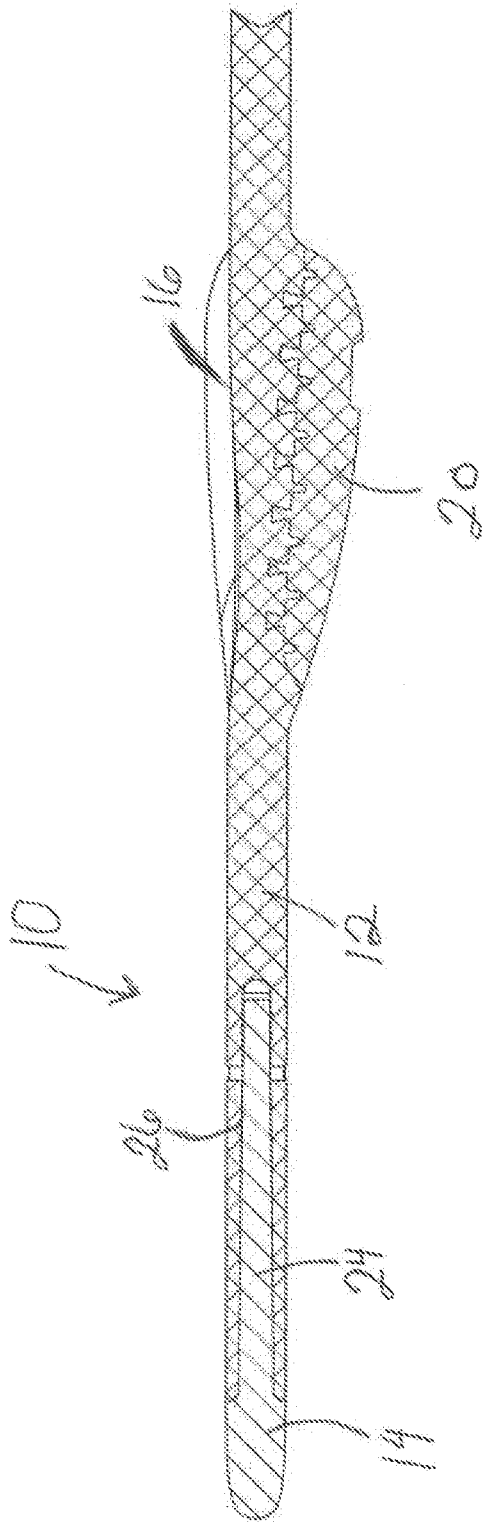


Fig. 6

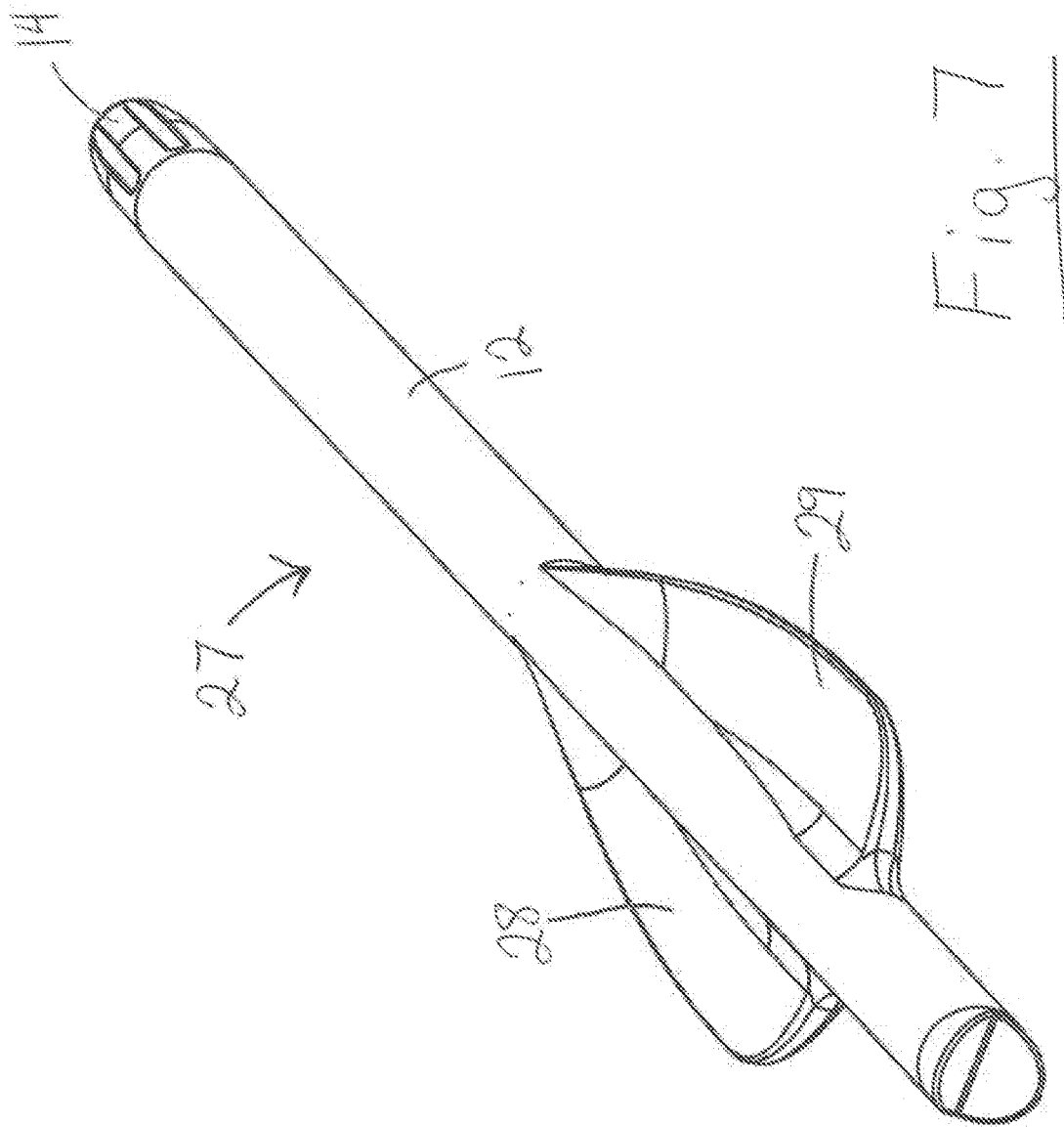


Fig. 7

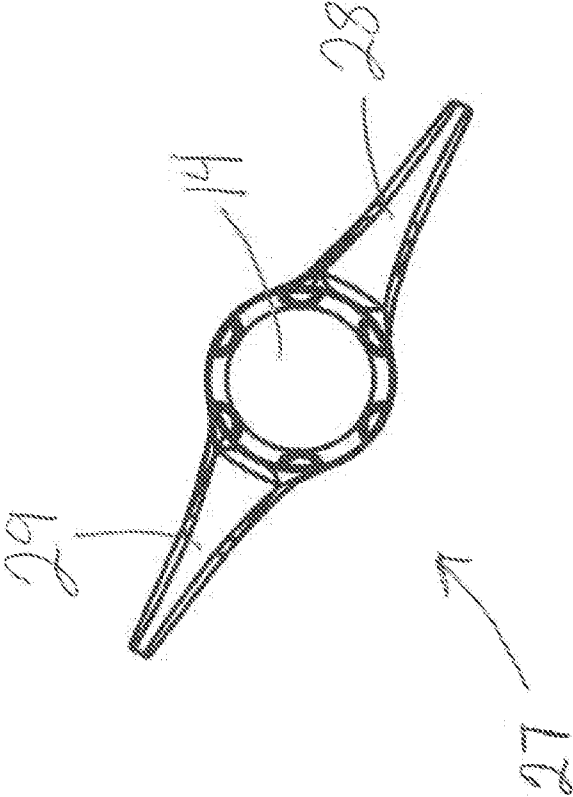


Fig. 8

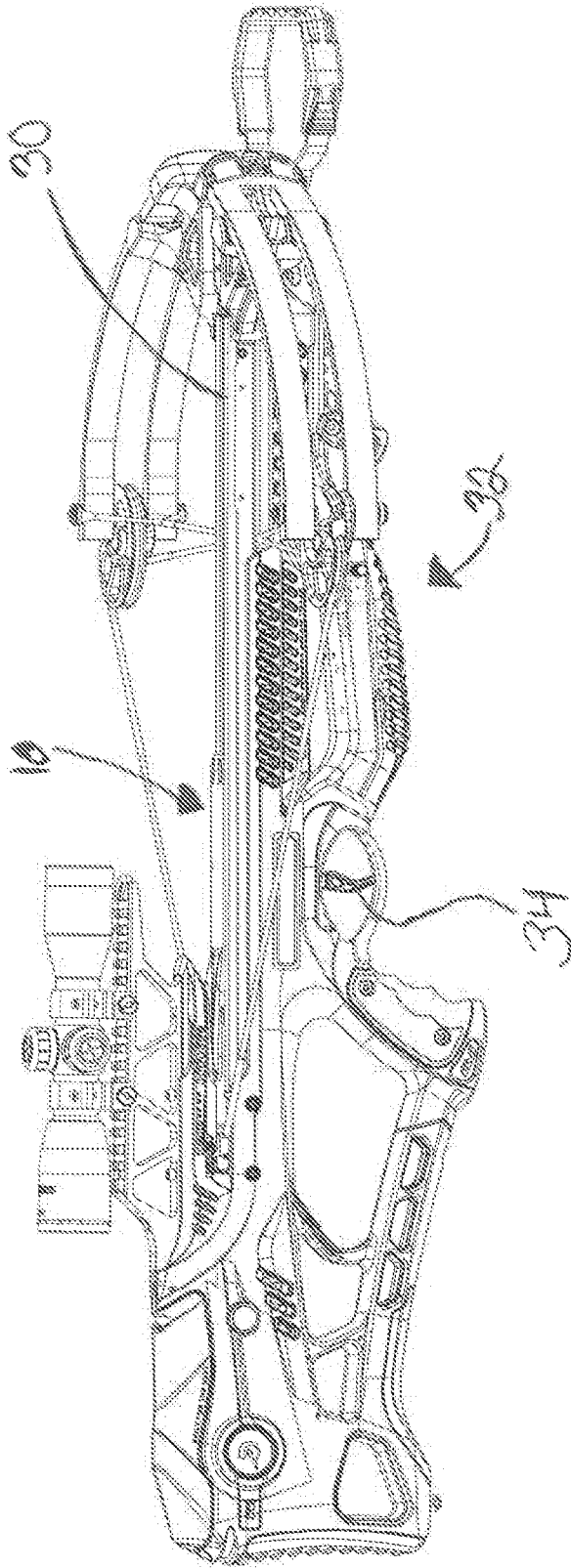


Fig. 9

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 16/12143

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - F42B 6/02, F42B 6/04, F41B 5/14 (2016.01)

CPC - F42B6/02, F42B6/04, F41B5/14, F41B5/1469

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC (8) F42B 6/02, F42B 6/04, F41B 5/14 (2016.01)

CPC: F42B6/02, F42B6/04, F41B5/14, F41B5/1469

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

IPC (8) F42B 6/02, F42B 6/04, F42B 6/00, F42B 6/08, F41B 5/14, F41B 5/12 (2016.01)

CPC: F42B6/02, F42B6/04,

F42B6/00, F42B6/08, F42B12/02, F41B5/14, F41B5/12, F41B5/1469, F41B5/123

(keyword limited; terms below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

PatBase; Google Patents; Google Scholar; Google Web;

Search terms used: Crossbow dart bolt arrow unloading uncocking decocking discharge length weight mass fletches feather vane recess glow hole dent glow

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 8,376,882 B2 (Shaffer et al.) 19 February 2013 (19.02.2013), entire document, especially Fig. 1, 7; col 6, ln 37-41; col 7, ln 48-49; col 8, ln 64 to col 9, ln 1; col 6, ln 58-61; col 1, ln 13-15; col 11, ln 43-47; col 11, ln 40-42; col 11, ln 47-50; col 9, ln 14-17;	1-15, 18-22 ----- 16-17
X --- Y	US 8,500,579 B1 (Long et al.) 06 August 2013 (06.08.2013), entire document, especially Fig. 1, 2; col 2, ln 16-18; col 2, ln 49-51; col 3, ln 19-20;	1, 16 ----- 16
X --- Y	US 2011/0218063 A1 (Hunt) 08 September 2011 (08.09.2011), entire document, especially Fig. 1; para[0003]; para[0028]; para[0031]; para[0032];	1, 17 ----- 17
A	US 2014/0031153 A1 (Boretto) 30 January 2014 (30.01.2014), entire document	1-22
A	US 4,615,552 A (Bengtson) 07 October 1986 (07.10.1986), entire document	1-22
A	US 8,123,636 B1 (Temprine) 28 February 2012 (28.02.2012), entire document	1-22

☐ Further documents are listed in the continuation of Box C.

* Special categories of cited documents:

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

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Date of the actual completion of the international search

25 February 2016

Date of mailing of the international search report

04 MAR 2016

Name and mailing address of the ISA/US

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