United States Patent [19]

Carella

[11] **3,881,730**

[45] **May 6, 1975**

[54] **ARROWHEAD**

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[22] Filed: **Sept. 4, 1974**

[21] Appl. No.: **502,937**

Related U.S. Application Data

[62] Division of Ser. No. 442,419, Feb. 14, 1974.

[52] **U.S. Cl.** ..... **273/106.5 B;** 273/106.5 C

[51] **Int. Cl.** **F41b 5/02**

[58] **Field of Search** ..... 273/106.5 B, 106.5 R

[56] **References Cited**

UNITED STATES PATENTS

2,212,345	8/1940	Krieger	273/106.5 R
2,549,235	4/1951	Ramsey	273/106.5 B
2,589,137	3/1952	Ramsey	273/106.5 B
2,874,968	2/1959	Zielinski	273/106.5 B
3,672,677	6/1972	Moore	273/106.5 B

Primary Examiner—Paul E. Shapiro

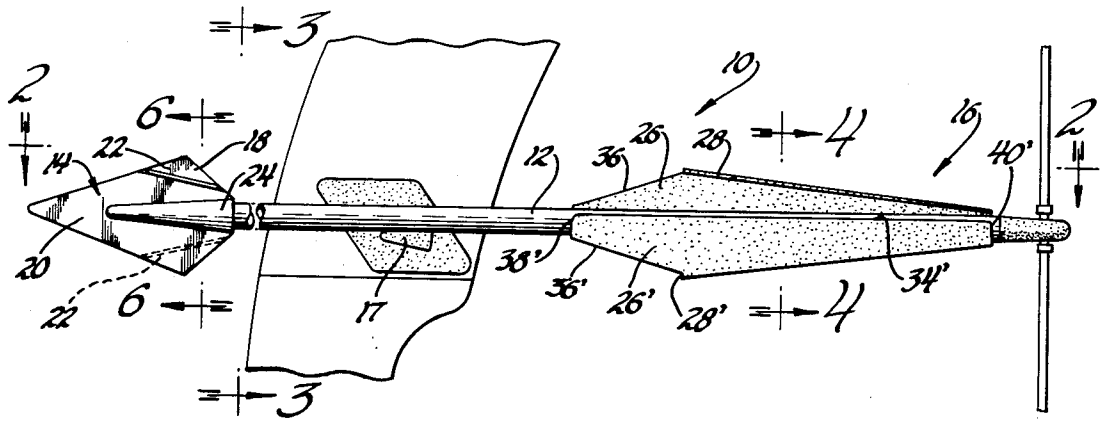
Attorney, Agent, or Firm—McGlynn and Milton

[57] **ABSTRACT**

An archery arrow comprising a shaft having a circular cross section with a forward end and rearward end. The improvement comprises a vane system adjacent the rearward end of the shaft for stabilizing the flight of the arrow. The vane system comprises first and second vanes disposed diametrically opposite one another on the vane shaft. Each vane is defined by an integral member having an aerodynamic fin extending tangentially from one side of the shaft and supporting the vane so that the vane is spaced from the shaft, the spacing between the vane and the shaft decreasing from the forward end of the vane to the rearward end thereof so as to define a pocket between the vane and the shaft of decreasing volume from front to rear to create pressures upon the vane and the aerodynamic fin to cause the arrow to rotate.

A hunting arrowhead is also disclosed. The head includes two identical halves. Each of the halves includes a pair of planar sections with the planar sections of one-half abutting the planar sections of the other half, one of the planar sections of each half includes an outwardly extending fin. The fins are disposed on diametrically opposite sides of the arrow shaft and are inclined inwardly toward each other or toward the arrow shaft in a direction from front to rear.

6 Claims, 7 Drawing Figures



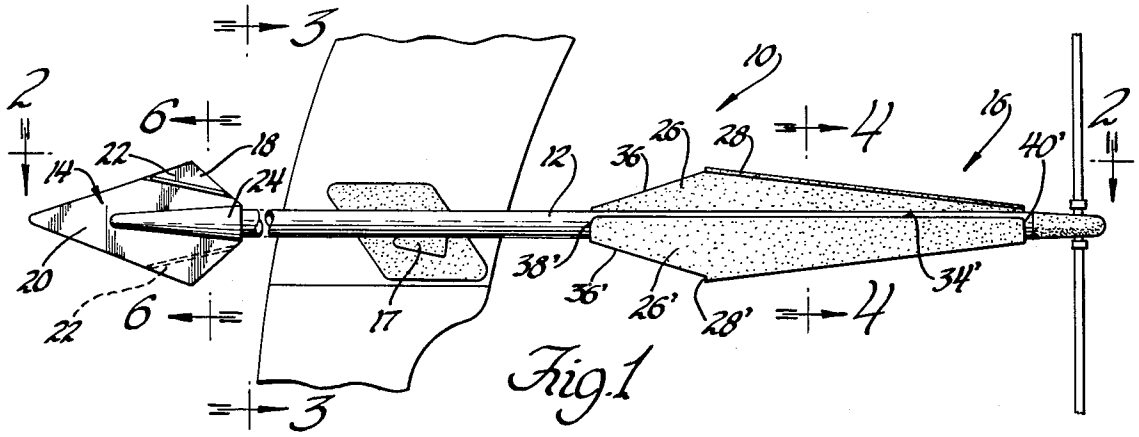


Fig.1

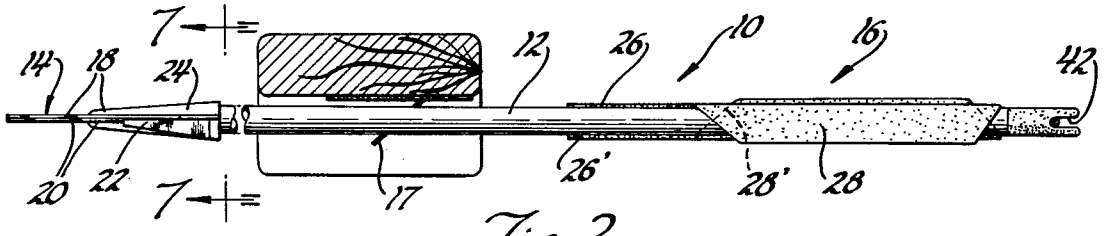


Fig.2

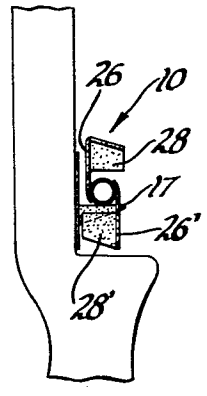


Fig.3

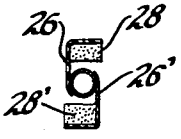


Fig.4

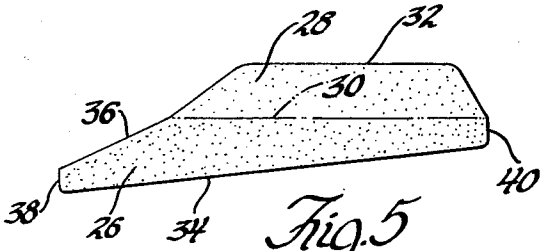


Fig.5

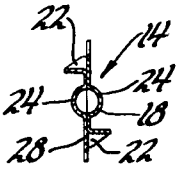


Fig.6

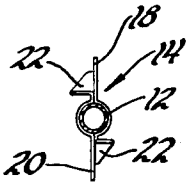


Fig.7

ARROWHEAD

This application is a division of co-pending application Ser. No. 442,419, filed Feb. 14, 1974.

This invention relates to an improvement in archery arrows and, more specifically, to an improved arrowhead attached to the forward end of an arrow shaft.

It has been recognized that the flight of an arrow is much more accurate as the rotation of the arrow increases. This is particularly true with hunting arrows, which have points or arrowheads which may plane or cause an aerodynamic affect upon the arrow when the arrow is not properly rotated.

The subject arrowhead is of the type disclosed in U.S. Pat. Nos. 2,589,137 to J. C. Ramsey and 2,874,968 to E. J. Zielinski. These arrowheads are typical of the prior art arrowheads wherein the arrowheads do not contribute to the rotation of the arrow.

In contradistinction, the subject invention relates to an arrowhead having a simple construction but yet is configured to induce rotation of the arrow shaft. Such is accomplished by an arrowhead having first and second identical halves with each of the halves having a pair of planar sections which abut the planar sections of the other half with one of the planar sections of each half having an outward extremity thereof extending laterally to define a fin. Thus, the arrowhead has an aerodynamic fin extending laterally from one side of the planar sections on one side of the arrow shaft and a fin extending in the opposite direction from the planar sections on the other side of the arrow shaft. Further, each of these aerodynamic fins are inclined inwardly toward each other in a direction from front to rear, i.e., they converge toward the axis of the arrow shaft. The arrowhead of the subject invention has been found to greatly stabilize the flight of an arrow.

Other advantages of the present invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

FIG. **1** is a fragmentary side elevational view of a preferred embodiment of the subject invention shown in the nocked position with an archery bow;

FIG. **2** is a plan view taken substantially along line 2—2 of FIG. **1**;

FIG. **3** is a cross-sectional view taken substantially along line 3—3 of FIG. **1**;

FIG. **4** is a cross-sectional view taken substantially along line **4**—**4** of FIG. **1**;

FIG. **5** is a view of an integral element in the flat shape before being folded along a crease or fold line for defining a vane member of the instant invention;

FIG. **6** is a cross-sectional view taken substantially along line **6**—**6** of FIG. **1**; and

FIG. **7** is a cross-sectional view taken substantially along line 7—7 of FIG. **2**.

Referring now to the drawings wherein like numerals indicate like or corresponding parts throughout the several views, an arrow constructed in accordance with the instant invention is generally shown at **10**.

The arrow **10** includes a shaft **12**, which includes a circular outer periphery as may be defined by a tubular or solid element comprising tubular aluminum, solid wood or other material suitable for use in archery arrows. The shaft **12** has a forward end upon which is disposed a hunting head, generally indicated at **14**, and a rearward end upon which is disposed the vane system, generally shown at **16**. The arrow is supported in the nocked position by an arrow support **17**.

The hunting head **14** comprises two identical halves **18** and **20**. Each of the halves **18** and **20** have a pair of planar sections which abut a pair of planar sections of the other half. One of the planar sections of each of the pairs includes an outwardly extending extremity or aerodynamic fin **22** which extends laterally outwardly from the adjacent planar section of the other half. The planar sections define aerodynamic fins or vanes as do the outwardly extending extremities **22**. The outwardly extending extremities **22** of the halves **18** and **20** are diametrically disposed on opposite sides of the arrow shaft and are inclined inwardly toward each other or toward the arrow shaft in a direction from front to rear as is best illustrated in FIG. **1**. The central portion of each half is defined by an arcuate or truncated cone section **24**, which is adapted to receive the arrow shaft **12**. The halves are integral members and may be secured together by an adhesive, brazing, welding, or the like, depending upon whether the arrowhead is made of a plastic or metal material.

The extremities **22** which extend laterally from the planar sections of the arrowhead halves **18** and **20** are disposed so as to stabilize the flight of the arrow by inducing rotation of the arrowhead and consequently rotation of the arrow shaft.

The arrow assembly or system **16** is defined by a pair of identical integral members which are formed from blanks of the shape shown in FIG. **5**. Each integral member defines a support means comprising an aerodynamic fin **26** or **26'**. Since each arrow shaft **12** employs two identical integral members, the identical parts of the two integral members will be designated by like numbers with one of the numbers being designated by a prime (').

Each integral member also defines a vane **28** or **28'** which extends laterally from the associated fin **26** or **26'**. Each vane portion **28** or **28'** is spaced from the shaft **12** and on the same side of the associated aerodynamic vane **26** or **26'** as the shaft **12** so as to extend over the shaft **12**. More specifically, each vane **28** or **28'** is substantially coextensive with the diameter of the arrow shaft so that when the arrow is in the nocked position illustrated best in FIG. **3**, the vanes will not interfere with the bow upon forward movement of the arrow upon release. As actually illustrated, the vanes **28** and **28'** each extend beyond the extremity of the shaft as shown at **29** but not enough to interfere with the bow upon release of the arrow.

Each vane **28** and **28'** is disposed so that the spacing between the vane and the shaft **12** decreases from the forward end of the vane, or the end of the vane nearest the forward end of the shaft **12**, toward the rear end of the vane, or the end of the vane nearest the rearward end of the shaft **12**, so as to define a pocket between each vane **28** and **28'** and the circumference of the shaft **12** which is of decreasing volume in a direction from front to rear. As an alternative, instead of the pocket of decreasing volume being defined between the vane **28** or **28'** and the shaft **12**, the pocket may be defined by the vane **28** or **28'** and a second vane extending laterally or transversely of the support fins **26** or **26'**. Such a second vane may be generally parallel to the arrow shaft **12** or may be inclined or at an angle other than 180° relative to the axis of the shaft **12**.

As best illustrated in FIG. 3, the support means dedefined by the aerodynamic fins 26 and 26' extend tangentially from the shaft 12 in a direction which is opposite to one another but yet parallel to one another. In other words, the aerodynamic fin 26 extends tangentially from the shaft 12 in a direction which is opposite to but parallel to the direction in which the aerodynamic fin 26' extends from the shaft 12. As illustrated, the aerodynamic fins 26 and 26' are adhesively secured to the arrow shaft 12.

As alluded to hereinabove, each vane unit is defined by an integral member comprising, for the purpose of description, an aerodynamic fin 26 or 26', which defines support means, and a vane 28 or 28'. As will be appreciated, however, both the aerodynamic fins 26 and 26' and the vanes 28 and 28' are air foils producing an aerodynamic result upon movement through the air. The integral member as shown in FIG. 5 has a crease or fold line 30, which extends longitudinally therealong. The vane 28 extends from the crease or fold line 30 to an outer edge 32, which extends generally parallel to the crease or fold line 30. The aerodynamic fin 26 extends in another direction from the crease or fold line 30 to a lower edge 34. The lower edge 34 is inclined or slanted toward the crease or fold line 30 in a direction from the front to the rear. The integral member as shown in FIG. 5 is shown in the position before being folded along the crease or fold line 30 to dispose the vane 28 in a direction substantially 90° to the plane of the aerodynamic fin 26. The aerodynamic fin 26 includes a nose portion defined by an upper edge 36 which extends in an inclined direction downwardly and forwardly from the forward end of the crease or fold line 30 toward the lower edge 34. The nose portion of the aerodynamic fin includes a front edge 38 which extends between the forward end of the upper edge 36 and the forward end of the lower edge 34. Also included is a rear edge 40 extending between the rearward end of the lower edge 34 and the rearward end of the crease or fold line 30.

Preferably, the lower edge 34 or 34' of each integral member includes a strip of adhesive which may be pressed against the arrow shaft 12 for retaining the integral unit to the shaft. The lower edge 34 is disposed generally parallel to the axis of the shaft 12 so that the associated vane 28 or 28' is disposed in spaced relationship to the shaft but in a plane which slants downwardly from front to rear to define a pocket of decreasing volume. As the arrow moves through the air, pressure builds up in the pocket to create a pressure against each aerodynamic vane 26 and 26' to urge the arrow to rotate in a counterclockwise direction, as viewed in FIGS. 3 and 4. Of course, the pressure buildup also acts radially outwardly against the vanes 28 and 28'.

The notch 42 at the end of the arrow shaft 12 is disposed in a direction which is parallel to the aerodynamic fins 26 and 26' whereby the vane assembly is disposed as shown in FIG. 3 so that the vanes 28 and 28' do not interfere with the bow upon release of the arrow, yet are disposed diametrically on opposite sides of the arrow shaft 12. As alluded to above, the aerodynamic fins 26 and 26' are generally parallel to one another and perpendicular to a diameter of the arrow shaft, which is, in turn, perpendicular to the notch 42 in the end of the arrow shaft.

The vane units are preferably made of a thin pliable plastic material which may flex but returns to its original configuration. In fact, actual tests have shown that the arrow as shown at 10 may be pulled through a bale of straw and the vanes system will not be damaged because each vane wraps itself tightly about the shaft to pass through the bale and returns to its original shape upon leaving the bale.

The invention has been described in an illustrative manner, and it is to be understood that the terminology which has been used is intended to be in the nature of words of description rather than of limitation.

Obviously, many modifications and variations of the present invention are possible in light of the above teachings. It is, therefore, to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. An arrowhead comprising first and second identical halves, each of said halves having a pair of planar sections which abut a pair of planar sections of the other half, one of said planar sections of each of said pairs having an outward extremity thereof extending laterally outwardly from the adjacent planar section of the other half to define a fin, said fins of said halves being diametrically oppositely disposed and inclined inwardly toward each other in a direction from front to rear.

2. An arrowhead as set forth in claim 1 wherein said fins are planar.

3. An arrowhead as set forth in claim 2 wherein each of said fins is perpendicular to said adjacent planar section of the other half.

4. An arrowhead as set forth in claim 3 wherein each of said adjacent planar sections is completely planar.

5. An arrowhead as set forth in claim 4 wherein each of said halves includes an arcuate central section for engaging an arrow shaft.

6. An arrowhead as set forth in claim 5 wherein each of said halves is an integral member.

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