April 14, 1959 L. S. MEYER 2,882,055

ARCHERY ARROW

Filed May 27, 1957 2 Sheets-Sheet 1

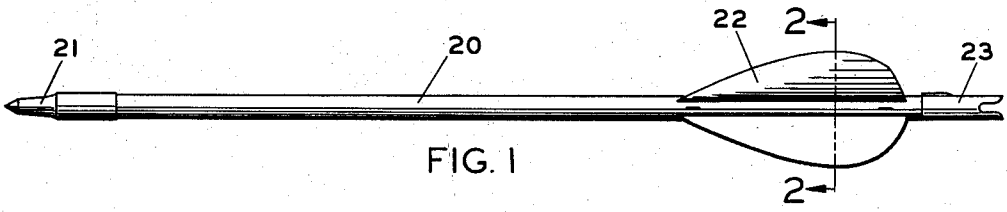


FIG. 1

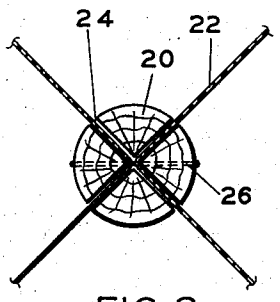


FIG. 2

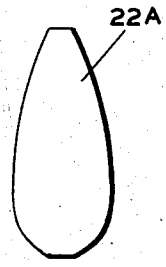


FIG. 3

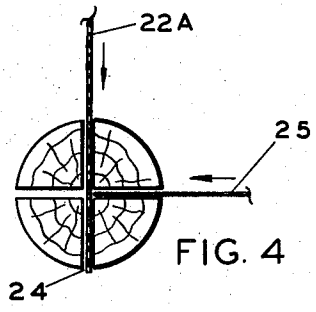


FIG. 4

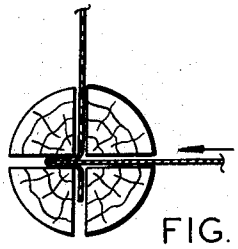


FIG. 5

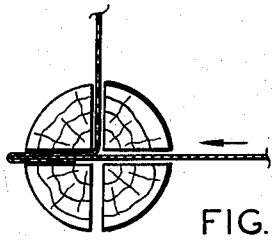


FIG. 6

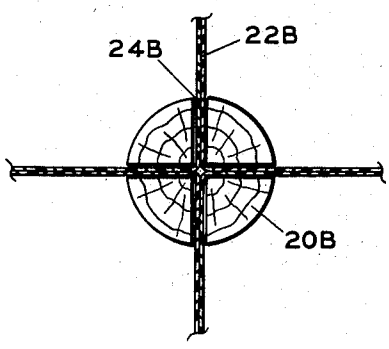


FIG. 7

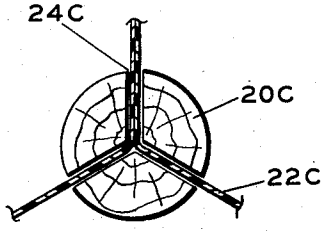


FIG. 8

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ARCHERY ARROW

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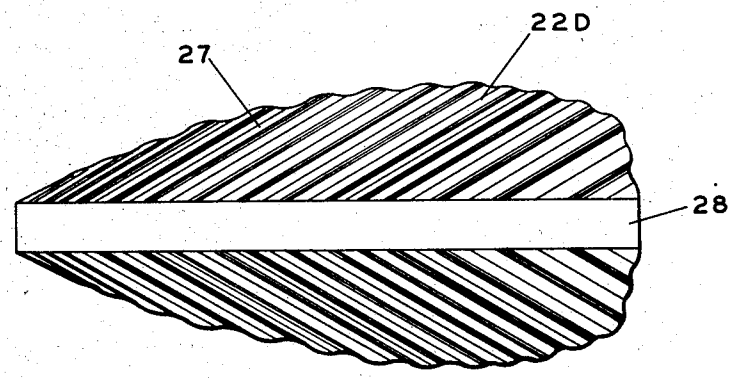


FIG. 9

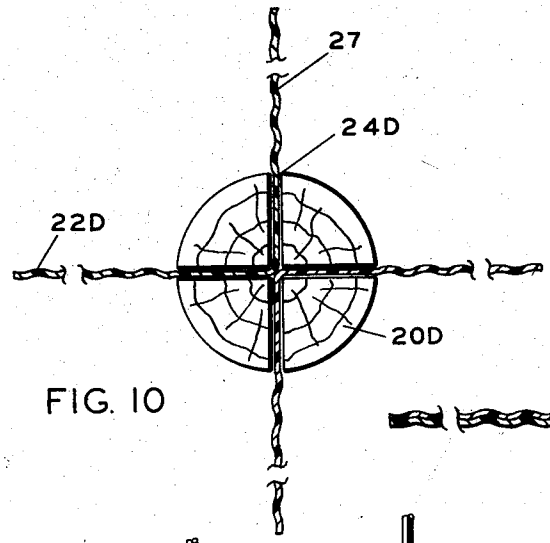


FIG. 10

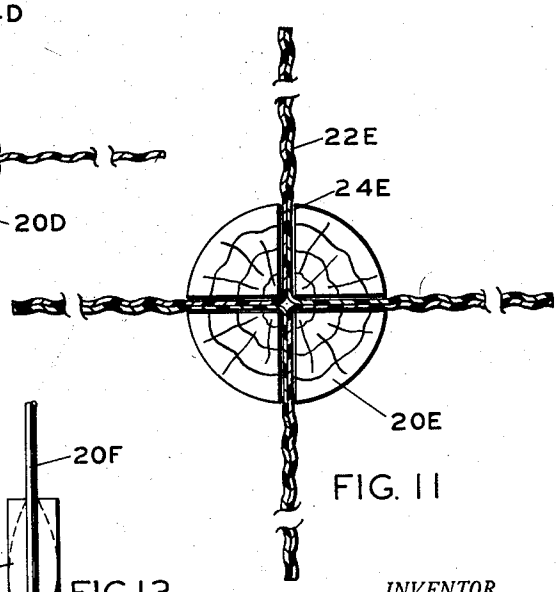


FIG. 11

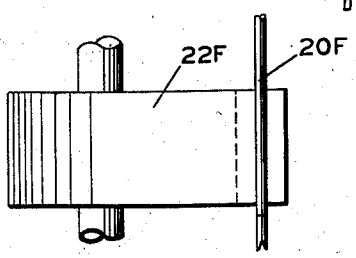


FIG. 12

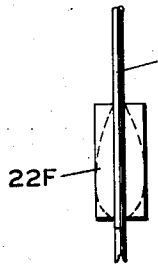


FIG. 13

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2,882,055

ARCHERY ARROW

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Application May 27, 1957, Serial No. 661,712

1 Claim. (Cl. 273—106.5)

My invention relates to an archery arrow. It has to do, more particularly, with the fletchings of an arrow and to a method of applying the fletchings to the shaft of an arrow.

Fletchings are the feather vane members used adjacent the trailing ends of the shafts of arrows to improve their performance in flight and their accuracy. It is usual to make these fletchings of actual feathers or simulated feather material. The application of the feathers to the shafts is difficult and time-consuming and cannot be adapted to economic production methods. Furthermore, it is difficult to firmly secure the feathers to the shaft in such a manner that they will not be displaced therefrom. Also, it has not been possible in the prior art to use materials which will withstand the wear and shock of repeated use of the arrow.

One of the objects of my invention is to provide an arrow which has fletchings mounted on the trailing end of the shaft accurately located and firmly secured thereon without danger of displacement, the fletchings being of material which will withstand repeated use and will still function properly as guide means and stabilizer means during the arrow flight.

Another object of my invention is to provide a simple method for applying the fletchings to the arrow shaft which is capable of adaptation to production methods.

Various other objects will be apparent.

According to this invention, the fletchings are made of sections of flexible plastic sheet material. The sections are properly shaped and are inserted in longitudinal slots in the trailing end of the shaft. These slots extend diametrically through the shaft or radially into the shaft and a plurality of them are provided so that they intersect or join each other at the center of the shaft. The fletching sections are so mounted in the angularly spaced radial slots that each section will be disposed in one slot and in a radial portion of another slot so that the section will have radially extending fletchings extending at an angle to each other which will project outwardly from the radial slots in which they are disposed beyond the outer surface of the shaft. Since each fletching section is disposed in two angularly related radial slots, it will be securely held in place.

In the accompanying drawings, I have illustrated fletchings on an arrow shaft in accordance with my invention and several variations of the method of applying the fletchings to the shaft. It is to be understood that other variations may be made without departing from the basic principles of my invention.

In these drawings:

Figure 1 is a side elevational view of an arrow having fletchings thereon in accordance with my invention.

Figure 2 is a transverse sectional view taken along line 2—2 of Figure 1 through the fletchings and associated arrow shaft.

Figure 3 is a plan view of one of the fletching sections before it is applied to the shaft.

Figure 4 is a diagrammatic view showing the first stage of the insertion of the fletching section into the receiving slots in the shaft.

Figure 5 is a similar view showing a further stage in the insertion operation.

Figure 6 is a similar view illustrating the approach to the final stage in the insertion operation.

Figure 7 is a view similar to Figure 2 but showing the fletching sections in the slots doubled.

Figure 8 is a view similar to Figure 7 but showing three radial slots in the shaft.

Figure 9 is a plan view of a fletching section which has its edges corrugated.

Figure 10 shows corrugated fletching sections of the type indicated in Figure 8 applied to the shaft.

Figure 11 is a similar view but showing the sections doubled.

Figure 12 shows how a roll of film may be used as the fletching material.

Figure 13 shows the trimming of the fletchings when formed by the roll material.

With reference to the drawings, in Figure 1 I have illustrated the complete arrow which comprises the shaft **20** having the point **21**, the fletchings **22** and the nock **23**. As previously indicated, my invention deals with the fletchings **22** and the manner in which they are mounted on the arrow. The fletchings **22** extend radially from the arrow shaft at angularly spaced intervals. They are disposed in radial slots formed in the arrow shaft **20** adjacent its trailing edge and are fixed therein.

For mounting the fletchings **22** on the shaft **20** which may be of wood, plastic, or any other suitable material, the shaft is provided with a plurality of longitudinally extending radially spaced slots. As shown in Figure 2, the slots **24** are formed by cutting a pair of slots diametrically through the shaft **20**, these slots being at right angles to each other and intersecting with each other at the center of the shaft. Obviously, these slots are of a length proper to receive the length of the fletchings. Thus, four radially extending slot portions are provided but this number may be varied by providing a different number of intersecting diametrically disposed slots, or joining radial slots.

As indicated in Figure 3, a fletching section **22*a*** is provided for forming a pair of the fletchings **22**. This fletching section is preferably of the feather shape shown and is preferably formed of relatively thin flexible plastic film material such as polyethylene film or rubber film. In inserting the fletching section **22*a***, its edge is passed through one of the slots **24**, as indicated in Figure 4, and then a blade **25** is passed through the slot at right angles thereto into engagement with the film to force one-half the section **22*a*** into the slot at right angles, as indicated in Figures 5 and 6, to provide a fletching **22** in one slot and a fletching **22** at right angles thereto in the adjacent slot, as shown in Figure 2. If desired, as the inserted edge of the film arrives at the intersection of the slots, the tool **25** may engage it and force it around the corner into the slot at right angles. Thus, one of the sections **22*a*** will be in two radial portions of the slots with a pair of the fletchings **22** integral and at right angles to each other. Another pair of fletchings **22** can be formed by a section **22*a*** inserted in the remaining two radial slot portions at right angles to each other, as shown in Figure 2.

The fact that one-half of each fletching section **22*a*** is disposed in each adjacent radial slot portion, to form fletchings **22** at right angles to each other will keep the fletching sections in position on the shaft. Further securing means in the form of staples **26**, as shown in Figure 2, may be provided and will be passed through the shaft **20** and both of the fletchings **22**. Adhesive can also be used to glue the films to the shaft if desired.

In Figure 7, I have shown an arrangement similar to Figure 2 but the fletchings **22***b* are each doubled. The fletching sections for forming each pair of fletchings **22***b* can be inserted in the same manner as illustrated in Figures 4, 5 and 6, but in this instance, there will be four sections used instead of two so that each radially projecting fletching **22***b* will be double. The double fletching film will fit snugly in the slots **24***b* in the shaft **20***b* but adhesive may be applied to the surfaces of the film so that when they contact in the slots they will adhere to each other. Another way in which the parts of each double fletching **22***b* can be secured together is by heat and pressure on the radially projecting portions thereof to melt the plastic material and cause the parts to adhere to each other. Thus, a unitary cross-shaped fletching unit is formed which cannot be displaced from the slots **24***b* and staples or adhesive are not necessary.

As previously indicated, a different number of slots can be used and these need not be diametrically disposed intersecting slots but may be radial slots which join at the center of the shaft. Thus, in Figure 8, I show three radial slots **24***c* in the shaft **20***c*. Two sections **22***c* of film may be used in these slots which will result in one double fletching and two single fletchings. A third section (not shown) could be disposed in the two slots **24***c* where the fletchings are single to also render them double if desired. The film will more naturally pass from one radial slot into an opposed slot in this form but the threading tool may be used in the remaining intermediate slot to aid in this action.

In Figure 9, I have illustrated how the fletching section **22***d* for forming a pair of the fletchings may have its edge areas **27** corrugated for strength and increased stability during flight. The center section **28** which will be disposed in the two right angularly disposed radial slot portions will not be corrugated. It will be apparent from Figure 10 that the corrugations **27** are deeper than the width of the slots **24***d* in the shaft **20***d*. However, these corrugations will be compressed during passage through the slots but will expand as shown in Figure 10 after passing out of the slots. The expanded corrugated sections **27** will then function to prevent the displacement of the section **22***d* relative to the slots.

In Figure 11, I have shown an arrangement similar to Figure 10 but the fletchings **22***e* are doubled by providing four fletching sections. These sections will be inserted in the slots **24***e* in the shaft **20***e* in the same manner previously described. The sections may be corrugated as in Figure 9 before insertion in the slots or may be corrugated after insertion. In the latter case, the radially projecting double portions thereof will be subjected to heat and pressure between corrugating platens which will not only corrugate them but will cause them to adhere together to form a unitary cross-shaped structure which cannot be displaced from the slots **24***e*.

I may use a strip of film in the form of a roll as shown in Figure 12. This strip **22***f* will be threaded from the roll into the cooperating slots in the shaft **20***f* as shown in this figure. After a section is threaded into the

cooperating slots the section may be severed from the roll and then the radially projecting portions may be trimmed, as indicated in Figure 13, to form the fletchings of desired shape.

It will be apparent from the above description that I have provided fletchings in the form of thin flexible material which will be of such a nature that it will function properly to guide and stabilize the arrow even after repeated use of the arrow. The fletchings will be formed by fletching sections, each of which provides a pair of the radially extending fletchings by being threaded into adjacent angularly related radial slot portions which meet at the center of the shaft. Because half of the fletching section is in each slot of an adjacent pair of angularly disposed radial slots, the fletching sections will be securely held in position in the slots. My method is such that the fletchings can be applied to the arrow shaft by a production method.

According to the provisions of the patent statutes, the principles of this invention have been explained and have been illustrated and described in what is now considered to represent the best embodiment. However, it is to be understood that, within the scope of the appended claim, the invention may be practiced otherwise than as specifically illustrated and described.

Having thus described my invention, what I claim is:

An arrow shaft having fletchings thereon, said fletchings being disposed in longitudinally extending angularly spaced radial slots which extend into the shaft and meet at the axis thereof, said slots being disposed longitudinally within the length of the shaft so that both the leading and trailing ends thereof are closed to provide unslotted shaft portions ahead of and behind the slots to give adequate strength to the shaft, two halves of said fletchings being formed by a unitary flexible fletching section which extends around a corner at the junction of the two adjacent slots and the corner being included within the two angularly related halves of the fletching section that extend out through the angularly related slots to project radially outwardly beyond the surface of the shaft, at least two of said fletching sections being provided and at least three of said slots being provided, two halves of different fletching sections which are in two of said slots being in a common slot in face to face contact with each other and having their faces adhered to each other.

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