July 8, 1958 L. W. ROPER 2,842,113

ARCHERY BOW

Filed Sept. 6, 1955

FIG_1

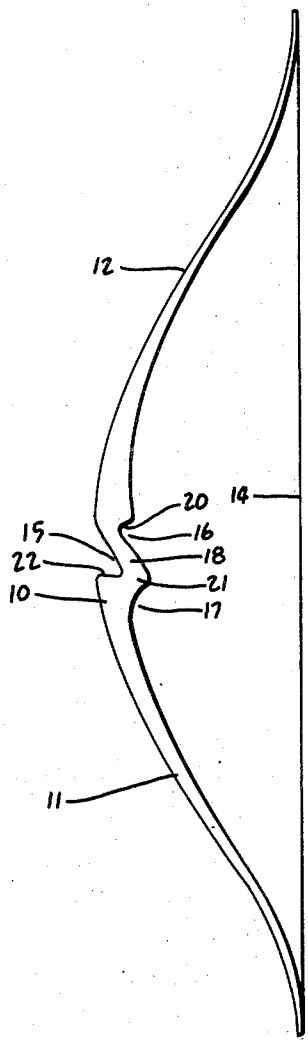


FIG_2

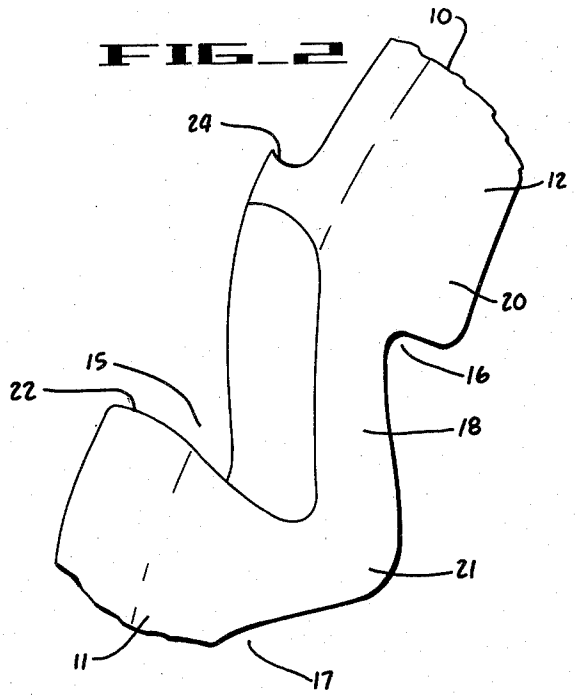


FIG_3

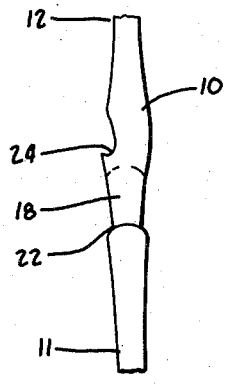
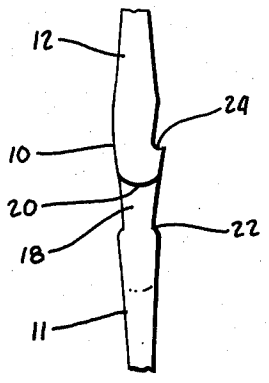


FIG_4



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2,842,113

Patented July 8, 1958

2,842,113

ARCHERY BOW

Lowell W. Roper, Oakland, Calif.

Application September 6, 1955, Serial No. 532,697

4 Claims. (Cl. 124—24)

This invention relates to archery bows for propelling arrows and more particularly to a bow having a center portion or handle especially shaped to fit the hand of the user.

It is among the objects of the invention to provide an archery bow the center portion or handle of which is so shaped that a portion thereof of a length substantially equal to the width of a hand is inclined downwardly and rearwardly or toward the bow string so that the fingers of the hand grasping the bow will fit comfortably and firmly around this portion with the wrist straight and the bow in an upright, substantially vertical position; which provides a rounded projection which fits comfortably into the palm of the hand holding the bow to provide a firm grip on the handle and a means for more accurately aligning the bow with the target; which relieves the bow of the tilting pressures which occur when a bow with a straight handle is held in shooting position and an arrow is drawn against the bow string so that a bow provided with the shaped handle of the present invention may have both upper and lower limbs of the same length and stiffness rather than making the lower limb shorter and stiffer than the upper limb as is done with straight handled bows; which enables the crotch of the thumb and forefinger of the hand holding the bow to fulcrum the bow so that the forces above and below the fulcrum point are equal and thus provides for the natural aiming or pointing of the arrow toward the target without the necessity for any compensation for tilting movement of the bow at the time the arrow is released; and which provides a handle of adequate strength and rigidity as well as one that is especially neat and attractive in appearance.

Other objects and advantages will become apparent from a consideration of the following description and the appended claims in conjunction with the accompanying drawing in which:

Fig. 1 is a side elevational view of a bow having a center portion or handle constructed in accordance with the invention;

Fig. 2 is a perspective view of the center or handle portion of the bow;

Fig. 3 is a front elevational view of the center or handle portion of the bow; and

Fig. 4 is a rear elevational view of the center or handle portion of the bow.

With continued reference to the drawing, the numeral **10** designates the center or handle portion of the bow, the numeral **11** the lower limb, the numeral **12** the upper limb and the numeral **14** the bow string. The upper and lower limbs **11** and **12** may be of conventional shape and construction except that both are preferably of the same length and stiffness, and the bow string **14** is of any usual or desired type and connected at its ends to the distal ends of the limbs **11** and **12** in the usual manner. When the bow is strung it has a generally convex back side remote from the bow string and a generally concave face side proximate to the bow string.

The handle section **10** includes three portions: an upper end portion, a lower end portion, and a grip portion **18** extending between and interconnecting the mutually adjacent ends of the upper and lower end portions. The upper and lower limbs **12** and **11** are joined to the upper and lower portions of the handle section and extend longitudinally from the mutually remote ends of the corresponding upper and lower portions of the handle section.

Archery bows of the character generally described above and in which the grip portion is substantially in line with the end portions of the handle section are old and well known.

In using a bow, the bow supporting arm is extended outwardly, substantially rigidly from the body and the bow supporting hand firmly grasps the grip portion with the bow string between this hand and the body. In order to hold the bow so that the bow string is substantially vertical the wrist of the bow supporting hand has to be bent upwardly so that the third and fourth fingers of this hand can extend around the grip portion. The arrow is then fitted to the bow string and drawn and the force required to draw the arrow puts an upward bending tension on the already upwardly bent wrist of the bow supporting hand and on the entire bow supporting arm. When the arrow is released this tension is suddenly relieved and the bow supporting hand tends to snap downwardly, inclining the bow downwardly and rearwardly and even moving the bow bodily downward before the arrow is entirely clear of the bow. This tends to spoil the aim of the arrow and, even though experts in archery learn to compensate this tendency to a satisfactory extent with light target bows, it has been found impossible to compensate when using a heavy bow, such as a stiff hunting bow.

Some attempts have been made to improve bow handle sections to overcome this tendency to snap the bow downwardly or to otherwise twist or shake the bow when the arrow is released but these previous attempts have been far from successful. The greatest previous modification has been to provide a rounded notch or recess in the rear or inner side of the bow at the upper end of the grip portion to provide a shoulder to rest on the hand at the crotch of the thumb and forefinger. Such a construction is shown in the patent to Meyer, No. 2,689,559, patented September 21, 1954. Such a construction does not, however overcome the necessity for radically bending the wrist in order to hold the bow string in upright position since the third and fourth fingers of the bow supporting hand must still extend around the unrelieved back or outer side of the bow handle in order to hold the bow steady.

It is conceived that, in order to hold the bow with the bow string substantially vertical and without bending of or undue strain upon the bow supporting arm and wrist, the grip portion of the handle section of the bow is so inclined that its prolonged longitudinal center line intercepts the taut but straight bow string at an angle which is substantially equal to the angle between the center line of the forearm and a line substantially touching all of the first joint finger knuckles of the bow supporting hand when the fingers are bent to form a fist and the wrist is held straight. It is contemplated, however, that since a limited amount of compensation on the part of the archer is possible, this range can be increased or reduced. It is therefore considered that a range of inclination of the prolonged longitudinal center line of the grip portion to the straight bow string of from 20 to 60 degrees of angularity is within the scope of the present invention.

Various methods of manufacturing the integral center or handle section with the inclined grip portion may be employed. As shown, the handle section is recessed to

provide notches **15** and **16** at the back and face sides of the grip portion **18**. These notches **15** and **16** are of generally triangular shape and oppositely directed, leaving between them the inclined grip portion **18** of substantially uniform thickness. If desired, one end of the handle section may be offset from the adjacent end of the grip portion, as indicated at **17** in Fig. 1 wherein the lower end of the handle section is offset forwardly from the lower end of the grip portion **18**.

The recesses **15** and **16** are so shaped and arranged that, when the strung bow is held in proper upright position with the bow string straight and substantially vertical, the grip portion **18** is inclined from its upper end downwardly and toward the bow string and the upper end of the recess **16** provides a shoulder **20** projecting from the face side of the upper end of the grip portion **18** toward the bow string. This shoulder and the adjacent portion of the grip is formed to provide a rounded notch which comfortably receives the web at the juncture of the thumb and forefinger of the bow supporting hand and provides a fulcrum for bending the bow.

The recesses **15** and **16** are so dimensioned that the grip **18** has a length somewhat greater than the width of the palm of the bow supporting hand for which the grip is designed, and the notch **15** provides a deep discontinuity in the curvature of the back side of the bow so that the back side of the grip portion is inclined to this curvature. It will be understood in this connection that bows of the character contemplated here are not only made in different sizes and with different draw pulls but are often semicustom made and fitted to the physical characteristics of the individual archer. They are also provided in right hand and left hand forms as may be required.

While a construction method has been suggested it is to be understood that the handle section may be produced by other methods as long as the integral nature of the entire section and the proper forward and rearward inclination of the grip portion is maintained.

The lower end of the grip portion **18** may be extended rearwardly or toward the bow string and rounded off to provide a smooth formation where the lower end of the grip portion joins the lower end of the handle section and the upper end of the grip portion may, except for the shoulder **20**, be smoothly faired into the lower end of the upper end portion of the handle section. The entire shape of the handle section, except for inclination, length and substantially uniform thickness of the grip portion may be extensively modified, if desired, for ornamental or other purposes.

For example the notch **15** may be provided as a partly or wholly inclosed finger opening and the shoulders **20** or **21**, or both of them, may be shaped with reverse curves.

A transverse arrow groove **24** is provided in one side of the handle at or just above the level of the shoulder **20** which will place the arrow at the top of the forefinger of the hand holding the bow so that the arrow will be aimed in the natural manner. The improved handle also tends to hold the bow straight with the straightened wrist and arm when the arrow is drawn so that there is no tendency for the center line of the arrow to pull out of the plane of the center line of the bow.

The center portion of the bow is preferably of laminated construction for maximum strength and shaped to fair at its ends gradually into the upper and lower limbs of the bow and the grip portion of the center portion or handle of the bow may be custom carved to fit the hand of the individual bowman and satisfy any detailed requirements of design or ornamentation, or the handles may be shaped to an average construction for quantity production. It is also within the scope of the invention to form the handle portion of the bow separately and of different materials, such as wood, metal or plastic.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is therefore, to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed is:

1. In an archery bow comprising a handle section, an upper limb extending longitudinally from one end of said handle section and a lower limb extending longitudinally from the other end of said handle section, said bow when strung having a generally convex back side and a generally concave front side, the improvement wherein said handle section comprises end portions joined at their outer ends to the inner ends of the corresponding limbs and a grip portion of a length somewhat greater than the width of a bow supporting hand extending between the spaced apart inner ends of said end portions with its back side inclined to the curvature of the back side of the bow, said grip portion having an inclination from the proximal end of the upper end portion to the proximal end of the lower end portion of said handle section downwardly and toward the line of the bow string such that the back and face sides of said grip portion are both inclined to the line of the bow string at an acute angle of not less than twenty nor more than sixty degrees.

2. In an archery bow comprising a handle section, an upper limb extending longitudinally from one end of the handle section and a lower limb extending longitudinally from the other end of the handle section, said bow when strung having a generally convex back side remote from the bow string and a generally concave face side proximate to the bow string, the improvement wherein said handle section includes a grip portion having a length at least as great as the width of a hand for which said handle section is dimensioned and a substantially uniform thickness such that said grip portion can be comfortably gripped by the hand for which the handle section is dimensioned, said grip portion having an inclination downwardly and toward the bow string from the proximal end of said upper limb such that when the grip portion is held in the hand with the wrist straight, the bow is disposed in a substantially vertical position.

3. In an archery bow comprising a handle section, an upper limb extending longitudinally from one end of said handle section, a lower limb extending longitudinally from the other end of said handle section, and a bow string adapted to extend between the distal ends of said limbs, said bow having, when strung, a generally convex back side and a generally concave face side, and said handle section having intermediate its ends a grip portion having a length somewhat greater than the width of a hand for which said handle section is dimensioned and having its front and back sides substantially parallel for the greater portion of the length thereof, said grip portion being inclined from its end nearest said upper limb downwardly and toward said bow string to an extent such that the longitudinal center line of said grip portion is disposed at an acute angle of not less than twenty nor more than sixty degrees to said bow string when the bow string is straight.

4. An archery bow comprising a handle section having intermediate its ends an inclined grip portion, upper and lower limbs extending longitudinally from the respectively opposite end of said handle section, and a bow string adapted to extend between the distal ends of said limbs when the bow is strung, said bow having, when strung, a generally convex back side and a generally concave face side, and said grip portion having a length at least as great as the width of the hand for which said handle section is dimensioned and an inclination from adjacent the proximal end of said upper limb downwardly toward the proximal end of said lower limb and toward the bow string such that when said bow is strung and said grip portion is gripped in the hand with the wrist straight and

the arm extended in bow holding position, the bow string is substantially vertically disposed, said bow having a discontinuity of the back and face curvature thereof along said handle section such that a recess is provided at the face side of the upper end of said grip portion to constitute a rest for supporting the bow on the hand and the thickness of said grip portion from back to face is maintained substantially uniform over the major portion of the length thereof.

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