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NOCKING POINT FOR BOWSTRING

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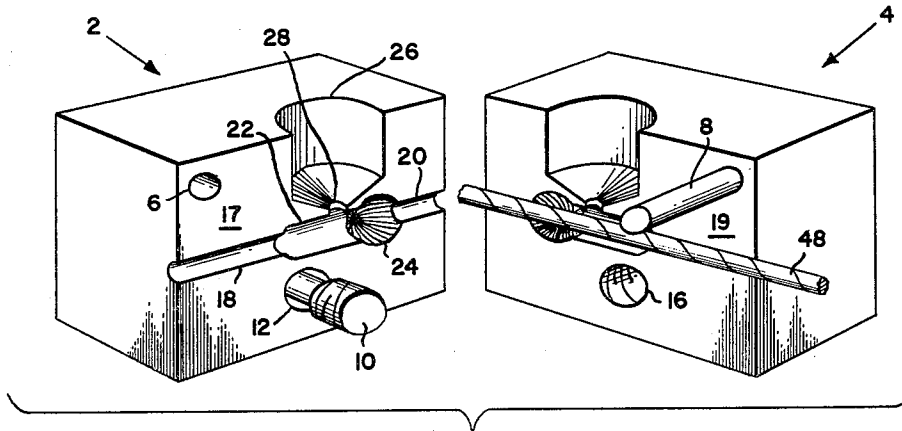


FIG. 1.

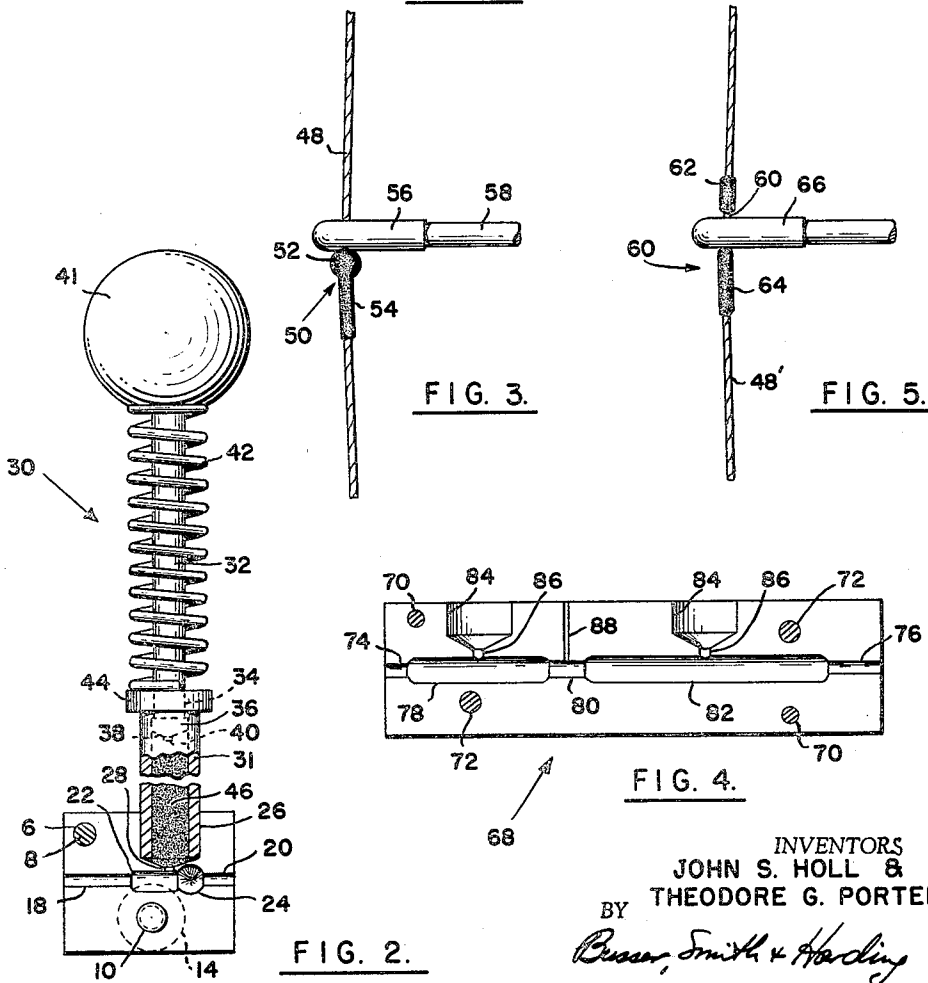


FIG. 2.

FIG. 3.

FIG. 4.

FIG. 5.

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NOCKING POINT FOR BOWSTRING

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This invention relates to archery equipment, more particularly to an improved nocking point on the string of the bow, and to the method and apparatus for producing the same.

It is customary for archers to improvise what is known as a "nocking point" or reference means on the string of a bow to insure that on each draw the arrow will strike a definite relationship to the bow. Typically, a nocking point might be fashioned by wrapping tape or string around a central portion of the bowstring to form a raised bead or the like against which the nock of the arrow is held. Such improvised means are not wholly satisfactory for several reasons. Primarily, tape or string is only a temporary expedient, in that it is subject to fraying, unraveling, etc. Secondly, there is the undesirable possibility that the nocking point so improvised will not maintain its position on the string but will tend to shift, making its replacement necessary. Finally, from the standpoint of appearance and satisfactory use these types leave much to be desired.

It is the main object of the invention to provide a nocking point which is not subject to the above disadvantages. According to the invention, a plastic material is molded around the central portion of the bowstring, or at two points thereof if desired, thereby providing a permanent nocking point which is highly satisfactory in use and pleasing in appearance. The invention resides not only in the nocking point, but also in the method and apparatus of producing the same.

Further objects and advantages will become apparent from the following description read in conjunction with the accompanying drawing, in which:

FIGURE 1 illustrates in perspective the two halves of a mold employed according to the invention;

FIGURE 2 illustrates a tool for injecting a plastic into the mold;

FIGURE 3 illustrates a bowstring having a nocking point provided thereon according to the invention;

FIGURE 4 illustrates one half of a modified mold for producing a different type of nocking point; and

FIGURE 5 illustrates a bowstring having a nocking point provided thereon by means of the mold shown in FIGURE 4.

Considering first the apparatus for molding the nocking point, in FIGURE 1 there is shown a two-part mold comprising a pair of blocks 2 and 4. In the interest of lightness, so that the mold can be comfortably carried with other equipment if desired, it has been found that blocks 2 and 4 may be satisfactorily cut from solid aluminum stock. Blocks 2 and 4 are identical with respect to their mold cavities and otherwise except that for the purpose of relatively locating the blocks, block 2 has a bore 6 therein adapted to receive rather closely a guide pin 8 in block 4; also, a screw 10 loosely received in a through bore 12 in block 2, and having a knurled head 14 (see FIGURE 2), acts in cooperation with a threaded bore 16 in block 4 as a means of tightly securing the blocks together. Both blocks 2 and 4 have machined front faces 17 and 19 adapted for very flat mutual engagement. Because the blocks 2 and 4 are identical, but for the exceptions mentioned, only the mold cavities in the block 2 need be described, it being obvious from FIGURE 1 that in this respect the blocks are identical. Straight channels 18 and 20 have a diameter approxi-

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mately the same as that of the bowstring to which the nocking point is to be molded. Intermediate the channels 18 and 20 are a straight cavity 22 of semicircular cross-section, having a diameter slightly greater than that of channels 18 and 20, and a hemispherical cavity 24 of a diameter greater than that of cavity 22. Means for the introduction into cavities 22 and 24 of a plastic in its highly deformable or liquid state is comprised by a small groove 28 connecting cavity 22 with the semicircular half 26 of a round bore (which obviously may be formed with a tapered drill when the blocks are clamped together).

Referring next to FIGURE 2, there is generally indicated at 30 a tool for injecting a plastic into the mold blocks 2 and 4. Tool 30 comprises a tube 31 having an outside diameter slightly less than the diameter of bore 26, and a plunger rod 32 reciprocable therein. At the upper end of tube 31 it has a reduced inner bore 34, whereby a shoulder is formed that is engageable with an enlarged head 36 on the rod 32. The lower end of head 36 is conical at 38, conforming to the conical bottom of bore 26, and terminates in a projection 40 receivable by the hole collectively defined by grooves 28. A sphere 41 threaded on rod 32 provides a handle and a spring 42 bottomed against a washer 44 normally maintains this handle and the rod 32 in their relatively outer position with respect to tube 31. The operation of tool 30 involves the forcing downwardly of rod 32 against the action of spring 42 to displace the raw plastic material 46 through the passage defined by grooves 28 and into the mold cavities 22 and 24.

It has been found that the most preferable plastic to be used is a polyethylene. As is well-known commercial polyethylene, one of the most popular plastics, has properties making it highly satisfactory for molding. For present purposes, polyethylene of the low or medium density type is preferred because of its generally higher melt index and lower molding temperature, which may be as low as 275 degrees. Polyethylene is, of course, a thermoplastic and it is employed according to the invention in a pellet form. It will be evident that if the tube 31 contains polyethylene in a softened state, as indicated at 46, and the tool 30 is inserted in the mold blocks 2 and 4 as shown in FIGURE 2, as rod 32 is forced inwardly against the action of spring 42 the polyethylene 46 will be injected into the cavities 22 and 24.

The process of applying a nocking point to a bowstring will now be described. The portion of the bowstring to which the nocking point is to be applied is placed, as indicated at 48, within the channels 18 and 20 of one of the blocks 2 and 4. The faces 17 and 19 of these blocks then are brought together, with the pin 8 projecting into bore 6. Thumb screw 10 is threaded into the tapped bore 16 and tightened, by means of knurled head 14, to hold the blocks tightly together. The bowstring portion 48 is then tightly clamped in the channels 18 and 20 mutually provided by the blocks 2 and 4. The tool 30 is taken separately and the tube 31 is filled with raw polyethylene in pellet form. By means of a flame, such as from an ordinary match, the tube 31 is heated to warm the polyethylene to a temperature at which it is substantially liquid. Tube 31 is then inserted in the bore 26, and by means of ball 41 the rod 32 is forced inwardly relative to tube 31 and the mold blocks 2 and 4, thereby forcing the polyethylene into the space surrounding the bowstring 48 in cavities 22 and 24. Tool 30 is withdrawn, and after a sufficient time has been allowed, say a few minutes, for cooling and solidification of the polyethylene, mold blocks 2 and 4 are parted.

When bowstring 48 is removed from the mold blocks it carries a finished nocking point which is essentially as shown in FIGURE 3. It will be understood, of course,

that residual burrs or the like may have to be trimmed by means of a pocket knife or the like. The nocking point, generally indicated at 50, comprises a first spherical bead-like portion 52 and, integral therewith, a slender sheath-like portion 54. In use, the nock 56 on the arrow shaft 58 is seated on the bowstring adjacent the nocking point 50 as illustrated in FIGURE 3.

The nocking point 50 may be formed either of an attractive, colored polyethylene or of transparent polyethylene, but in either case the appearance will be pleasing. In addition, the nocking point 50 will be tough and durable in use and may be considered to be permanently applied.

A modified form of nocking point, generally indicated at 60, is illustrated in FIGURE 5 and comprises a slender sheath-like portion 62 flanked by heavier portions 64 and 66. Nocking point 60 is molded around the bowstring 48' in essentially the same manner as nocking point 50, as will be presently described, and is used in association with the nock 66 of the arrow as illustrated. The nocking point 60 is formed in a pair of mold blocks having cavities as illustrated in FIGURE 4. Only one mold block 68 is illustrated, it being understood that, as in the case of FIGURE 1, both blocks are identical except for the means necessary to their connection. The blocks are relatively located by guide pins 70 and held together by thumb screws 72. Semicircular channels 74 and 76 have a diameter approximately the same as that of the bowstring portion 48'. A first semicircular cavity 78 corresponds in length and diameter to portion 62 of the nocking point. A semicircular cavity 80 corresponds in diameter and length to the portion 60, and a further semicircular cavity 82 similarly corresponds to the portion 64. Cylindrical bores are cooperatively defined between the blocks, as indicated at 84, and communicate with cavities 78 and 82 by passages 86. A passage for the escape of air from the intermediate cavity 80 is indicated at 88.

The process of applying a nocking point 60 by means of mold blocks having the details shown in FIGURE 4 is basically the same as the process previously described with reference to FIGURES 1, 2 and 3, with the exception that two of the tools 30 are simultaneously employed in association with the bores 84.

The invention is not limited to the use of any specific mold design whereby a particular nocking point is provided, but contemplates broadly the molding of the nocking point, in whatever shape is desired, around the bowstring. Thus a nocking point might be made up of integral spherical, cylindrical and slender sheath-like portions as desired, with the mold blocks merely having cavities corresponding to the shape of the end result. Also, although polyethylene is a highly satisfactory plastic for present purposes, it will be understood that other plastics having similar properties are equally applicable.

Various other departures from the specifically disclosed

embodiments of the invention may be made without departing from the scope thereof as defined by the following claims.

What is claimed is:

1. Hand operable and hand portable apparatus for forming a nocking point on an archery bowstring, comprising a hand-size portable two-piece mold having a cavity therein larger than the diameter of a bowstring and passages leading inwardly to said cavity and having a cross-sectional diameter approximately the same as that of a bowstring, said mold having inlet passageway means for the injection of a plastic material into said cavity, and a portable, hand operable plunger means for injecting said plastic material into said cavity, said plunger means being a separate unit from said mold.

2. Apparatus according to claim 1 comprising a guide pin on one piece of said mold and a guide hole in the other piece of said mold adapted to receive said pin for aligning said mold pieces in the molding position, and hand operable means engaging each of said mold pieces for securing the same together in the molding position.

3. Apparatus as claimed in claim 1 wherein said plunger means comprises a tubular member open at one end and adapted to contain said plastic material therein, said mold having a bore open at one end and communicating with said inlet passageway means at said other end, said bore being of substantially the same dimension as said tubular member so that said tubular member may be inserted therein so as to align said inlet passageway with said plunger and to provide a trap for the plastic material and guide it into said inlet passageway.

4. Apparatus according to claim 3 wherein said plunger means includes a plunger member mounted for movement through said tubular member for forcing the plastic material therein through the open end thereof and a spring biasing said plunger against said movement through the tubular member.

5. Apparatus according to claim 3 comprising a guide pin on one piece of said mold and a guide hole in the other piece of said mold adapted to receive said pin for aligning said mold pieces in the molding position, and hand operable means engaging each of said mold pieces for securing the same together in the molding position.

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