

April 6, 1965

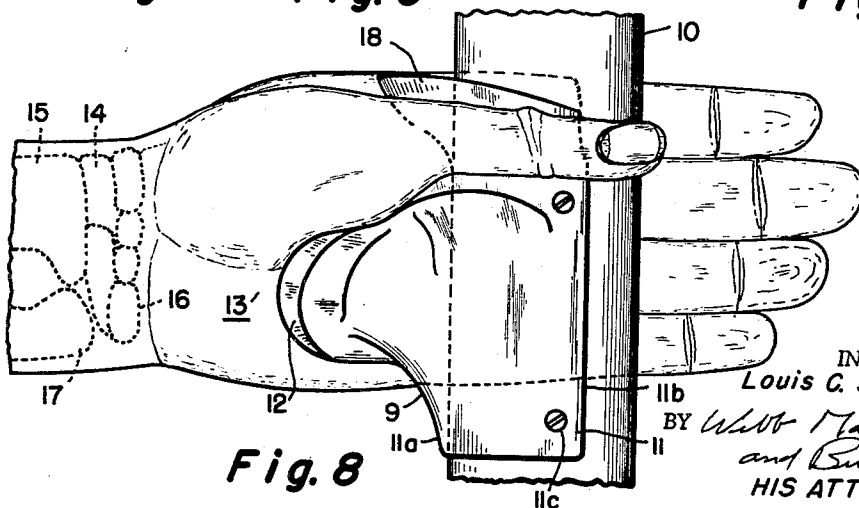
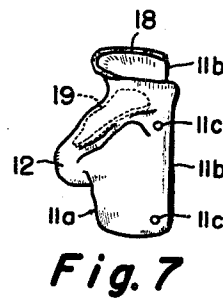
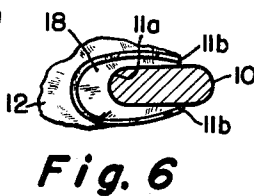
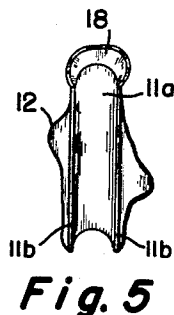
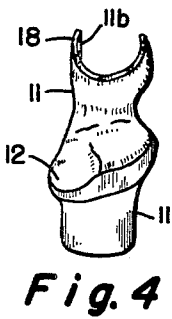
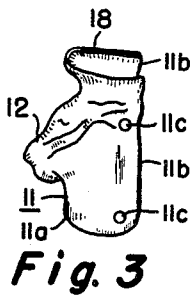
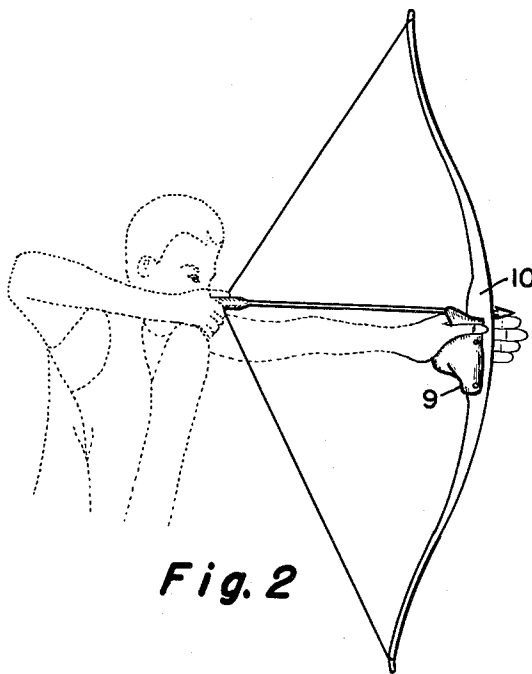
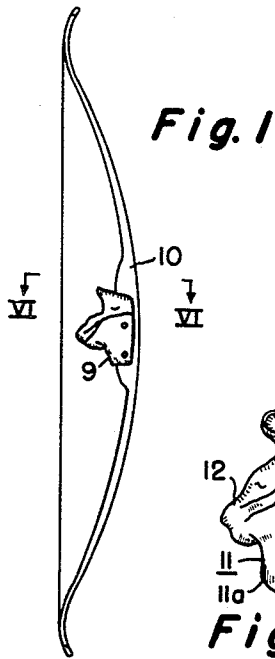
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3,176,674

HANDGRIP FOR BOWS

Filed May 12, 1961

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

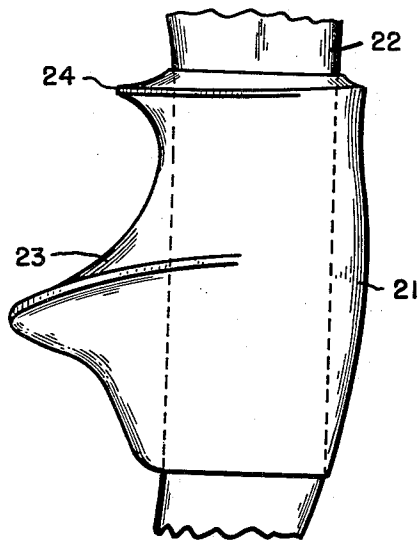


Fig. 9

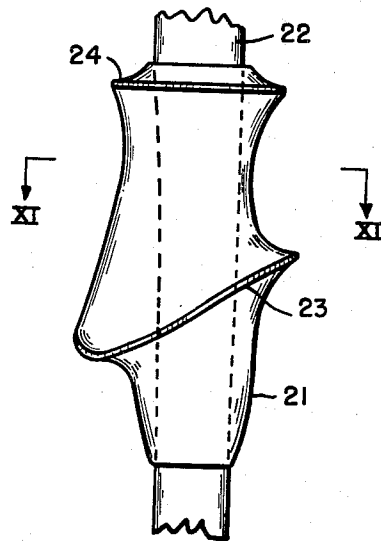


Fig. 10

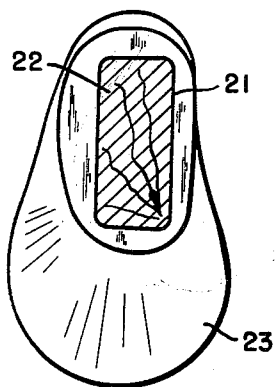


Fig. 11

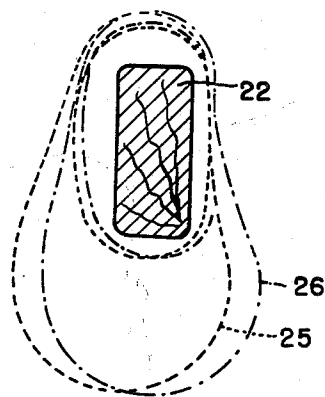


Fig. 12

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HANDGRIP FOR BOWS

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3 Sheets--Sheet 3

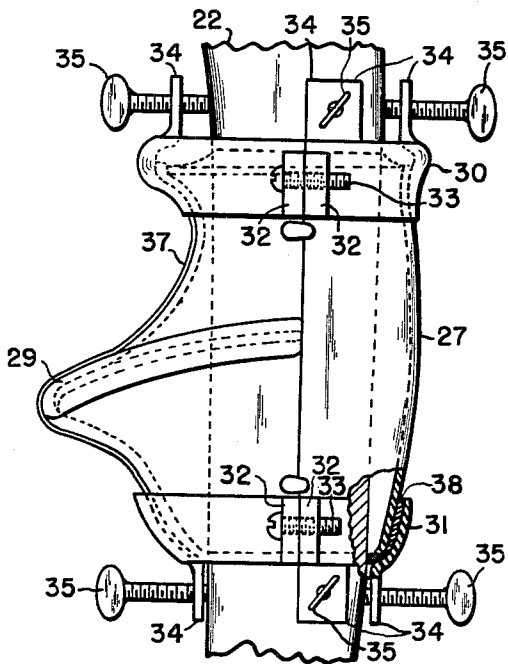


Fig. 13

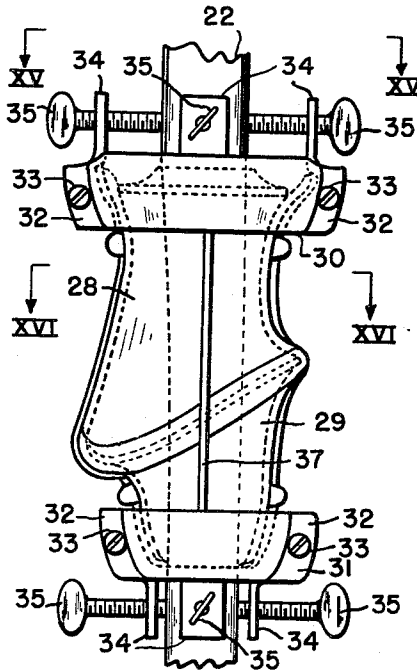


Fig. 14

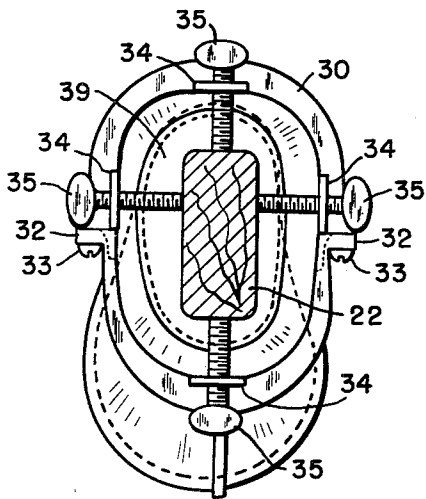


Fig. 15

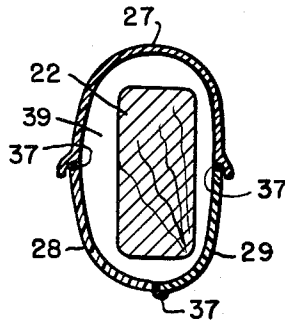


Fig. 16

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HANDGRIP FOR BOWS

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2 Claims. (Cl. 124-23)

This application relates to a handgrip for bows. More particularly, it relates to a handgrip for bows used in archery. This application is a continuation-in-part of my application Serial No. 749,295 filed July 17, 1958, now abandoned.

In shooting a bow, an archer holds the bow by its handle, which is in the center of the bow, with one hand and pulls the bow-string with the other hand, which also holds an arrow. In holding the bow, expert archers use what is known as a "straight wrist grip." In this grip, the fingers of the hand are not wrapped around the bow but extend straight beyond one side of the handle of the bow. The arm and bow are held so that the wrist, forearm, upper arm and shoulder are all substantially in a straight line. Because the wrist is straight out and the fingers are not wrapped around the handle of the bow, the full force of the drawn bow is taken entirely by the muscles between the thumb and the forefinger of the hand holding the bow. It is difficult to hold a bow steady in this position or to maintain the position for more than a short period of time because of the force required to draw a bow, which may be as much as 60 or 80 pounds. The result is that most archers, with the exception of the extremely skilled, cannot hold a drawn bow steady and they do not have adequate time to properly aim the arrow if they use the straight wrist grip. To overcome these difficulties, the average archer will bend his wrist downwardly so as to obtain more contact between the bow handle and his hand. The bent wrist grip has disadvantages in that the archer cannot come to a full draw because his elbow is bent and the bow is supported by only one bone and the forearm.

I have invented a handgrip for bows which overcomes these difficulties. I provide a grip which has a base which can be secured to the handle portion of the bow. From this base, there extends a body portion which extends in a direction away from the string side of the bow and contacts at least the portion of the palm of an archer which is opposite the heel of the archer's thumb. Preferably, this body portion contacts the entire surface of the palm and adjoining inner surface of the thumb. The body portion contacts the palm of the archer as just described when the archer is holding the bow in a straight wrist position and thereby the force of the bow is distributed over the whole hand of the archer instead of being carried solely by the muscles between the forefinger and the thumb. The archer is thereby able to hold a bow in a straight wrist position for relatively extended periods of time and the force on the bow is carried from the archer's hand to both bones in his forearm.

I have also invented a method of manufacturing the handgrip whereby the surface of the grip which contacts the inner surface of an archer's hand can be made to conform almost exactly to the shape of the archer's hand when it is under the pressure applied to it by a drawn bow. The grip thus assures that the archer will always grip the bow in the same manner when shooting.

I have also invented a method of manufacturing the handgrip and securing it to a bow in one operation. This method of manufacture avoids the insertion of screws or bolts into the bow which might affect the strength of the bow.

In the accompanying drawings, I have illustrated cer-

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tain presently preferred embodiments of my invention, in which:

FIGURE 1 is a side view of a bow with a handgrip embodying my invention attached thereto;

FIGURE 2 is an illustration of an archer with drawn bow showing the "straight wrist grip";

FIGURE 3 is a side view of the handgrip;

FIGURE 4 shows a rear view of my handgrip;

FIGURE 5 shows a front view;

FIGURE 6 is a cross-section through the bow on the lines VI-VI of FIGURE 1;

FIGURE 7 shows a side view of a grip and illustrates a step in my method of making the grip;

FIGURE 8 is an enlarged view illustrating a straight grip position and the manner in which my handgrip distributes the force of pulling a bow to both bones in the forearm of an archer;

FIGURE 9 is a side view of a modified form of grip;

FIGURE 10 is a rear view of the handgrip shown in FIGURE 9;

FIGURE 11 is a section along the lines XI-XI of FIGURE 10;

FIGURE 12 is a diagram showing how the grip shown in FIGURES 9 and 10 can be positioned relative to the bow;

FIGURE 13 is a side view of a mold which I have invented for applying the grip shown in FIGURES 9 and 10 to a bow;

FIGURE 14 is a rear view of the mold shown in FIGURE 13;

FIGURE 15 is a section along the lines XV-XV of FIGURE 14; and

FIGURE 16 is a section along the lines XVI-XVI of FIGURE 14.

Referring to the drawings and particularly to FIGURES 1 and 2, the handgrip 9 is designed to be secured to the handle portion 10 of any conventional bow and is grasped by an archer between his thumb and fingers so that it rests against the palm of his hand, as shown in FIGURES 2 and 8.

Referring to FIGURES 3 and 4, the grip has a base by which it is secured to the handle of a bow. In the particular embodiment shown in the drawing, this base is in the form of a generally U-shaped channel 11, the base 11a of which fits around the string side of the bow and the legs 11b of which extend along the sides of the bow at the handle portion of the bow. The base is held to the bow handle by screws which pass through holes 11c in the legs 11b.

A body portion 12 extends from the base 11 in a direction away from the string side of the bow over to the portion of the palm of an archer's hand which is opposite to the thumb. See FIGURES 2 and 8 which show the "straight wrist grip" and with the fingers of an archer extending beyond one side of the bow. Preferably, the body portion 12 has sufficient surface to fit against the entire palm and the inside surface of the thumb so as to provide a solid comfortable grip; however, the important feature of the grip is that the body portion 12 extends over to the portion of the palm of the archer which is opposite to the thumb and which is marked 13 in FIGURE 8. The reason for this is that the force of the bow when the bowstring is pulled is distributed through the archer's hand to both of the bones in the archer's forearm, as illustrated in dotted lines in FIGURE 8. Thus, the force exerted by the bow in the croch between the thumb and forefinger of the archer is distributed through carpal bones 14 to the radius bone 15 of the forearm and the force of the bow exerted against the palm of the hand opposite the thumb is distributed through carpal bones 16 to the ulna bone 17 adjacent the heel of the archer's hand.

When an archer holds a bow in the straight wrist position, the palm of his hand lies roughly in a plane which makes an angle of between 55° and 65° with the central longitudinal axis of the bow. For proper shooting, the bow is held vertically and, therefore, the angular position of the hand just described turns the elbow of the archer outwardly. This moves the forearm of the archer out of the path of the bowstring when the arrow is released, which is an additional advantage of the straight wrist position. Looking at FIGURE 4, it will be seen that the top surface of the body portion 12 which engages the palm of the archer slopes downwardly and rearwardly from the vicinity of the top of the base and forms an angle between 55° and 65° with the central longitudinal axis of the bow.

The upper end of the base 11 has an outwardly flaring lip 18 which extends part way along the sides of the thumb and forefinger which are opposed to each other and along the muscles in the hand between the thumb and forefinger. The lip also extends partially over those portions of the hand which it contacts so as to provide a grip whereby the bow can be held loosely in the hand, which is desirable for accurate shooting and for holding the bow in one hand when not shooting.

The grip can be made of any suitable material. Thus, it may be carved out of wood; it may be cast or die cast out of metal; or it may be molded from plastic such as urea formaldehyde condensation products or polystyrene.

I have also invented a method of manufacturing bow grips as just described whereby they can be made to fit the hand of any individual archer so closely that, in effect, the body portion 12 is an anatomical print of the hand of a particular archer when the bow is drawn and his hand is under pressure exerted by the drawn bow.

In accordance with the process which I have developed, a handgrip formed as just described and approximating the contour of an archer's hand is first made and secured to a bow. A thin layer of a moldable material 19 is placed on the surface of the body portion 12 which contacts the hand of the archer (see FIGURE 7). The archer grips the bow in the straight wrist position and pulls the bowstring as he normally would do in shooting. The force of the drawn bow spreads the moldable material 19 over the body portion 12 of the grip and against the archer's hand, thereby making an imprint of the archer's hand when it is spread under the force required to draw the bow. The archer's hand is then removed and the moldable material is allowed to harden. It is advisable to coat the archer's hand with some material which will prevent the moldable material from sticking to his hand while the grip is being formed.

A number of materials are suitable for use for the moldable material 19. One example is a self-curing moldable dough made from a finely-divided polymeric substance containing a polymerization catalyst such as an organic peroxide benzoyl peroxide and blended with a compatible plastic in monomeric form. The plastic in monomeric form contains a polymerization promoter which is also reducing in nature such as a tertiary amine which promotes the heating up of the dough into a solid at relatively low temperatures, for example, temperatures ranging from 65° to 112° F.

Preferably, the finely-divided polymeric substance is methyl methacrylate. The compatible plastic is methyl methacrylate in monomeric form. Other plastic materials may be used as ethyl or butyl methacrylate; likewise, other self-curing materials can be used such as self-curing rubbers and self-curing silicones.

FIGURES 9-11 show a modified form of my handgrip which is made in a manner hereinafter described by casting a cold-processing plastic material into a mold positioned around the handle portion of a bow. The handgrip comprises a base 21 which completely surrounds the handle portion 22 of a bow and a body portion 23 which slopes downwardly and rearwardly from the vicinity of

the top of the base to such an extent as to engage the portion of an archer's hand opposite the heel of the thumb when the archer is holding the bow in straight wrist shooting position. Referring to FIGURE 10, it will be seen that the top surface of the body portion 23 which engages an archer's hand lies roughly in a plane forming an angle of 55° to 65° with the central longitudinal axis of the bow. The sides and string side of the grip have an outwardly flaring lip 24 which corresponds to the lip 18 in the handgrip shown in FIGURES 1 to 6 inclusive. The handgrip shown in FIGURES 9 to 11 is, therefore, substantially similar to the handgrip shown in FIGURES 1 to 6 inclusive except that the base portion of the grip entirely surrounds the bow.

As stated above, the grip shown in FIGURES 9 to 11 inclusive is made by casting a cold processing plastic material in a mold surrounding the handle portion 22 of a bow. The mold can be positioned on the handle portion of the bow so that the grip is aligned with the bow in the manner preferred by each individual archer. Thus, referring to FIGURE 12, if an archer prefers to shoot "off the thumb," in which much of the force of the bow when the string is drawn is met by an archer's thumb, the grip can be positioned relative to the bow as shown by the dotted line 25 in FIGURE 12. If, however, the archer prefers to place the major force of the drawn string against the palm and fingers of his hand, the grip can be positioned relative to the bow in the position shown in the dot-dash line 26 in FIGURE 12.

The handgrip shown in FIGURES 9 to 11 inclusive can be made of a variety of cold processing plastic materials. One such material which I have found to be particularly satisfactory is cold-curing methyl methacrylate monomer-polymer mixture which can be poured into the mold and which sets up in the mold to form a solid body.

FIGURES 13 to 16 inclusive show a mold which I have invented to make the handgrip shown in FIGURES 9 to 11 inclusive. The mold can be made by any number of well-known techniques. One technique which I have found to be particularly suitable is the molding of vulcanite by a process similar to that used by the dental profession for the preparation of dentures. The mold is made in three sections—a front section 27 and two rear sections 28 and 29—so that the mold can be disassembled after the cold processing plastic material has set up in the mold. The three sections are assembled around the handle portion 22 of a bow and held together by a top collar 30 and a bottom collar 31.

The collars 30 and 31 are split in two, and the two halves have outwardly extending tabs 32 at their ends. When the collars 30 and 31 are assembled around the top and bottom of the mold sections, the tabs 32 abut against each other and one of the opposed tabs is threaded so that screws 33 can be passed through the abutting tabs and turned to hold the tabs and, therefore, the two halves of each collar together.

Each collar also has tabs 34 which extend away from the collar in a direction parallel to the longitudinal axis of the handle portion 22 of the bow when the mold is assembled on the bow. Each of the tabs 34 is tapped to receive thumbscrews 35 which extend through the tabs 34 to engage the sides of the handle portion 22 of the bow. By turning the thumbscrews 35, the position of the mold relative to the handle portion 22 of the bow can be adjusted.

To prevent the plastic material when liquid from leaking from the joints formed between the three sections of the mold, I provide a gasket 37 between the abutting edges of the mold sections 27, 28 and 29. As shown in FIGURE 13, another gasket 38 is placed between the lower collar 31 and the handle portion 22 of the bow so that the liquid plastic material, when poured, will not escape through the bottom of the mold.

The mold is assembled on the bow and positioned relative to the bow, as shown in FIGURES 13 to 16 inclusive.

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After the mold is assembled on the handle portion of a bow, it completely surrounds the bow and forms a mold cavity 39 which has the desired shape of the finished handgrip. Thereupon, cold processing plastic material is poured into the top of the mold until the mold is full. The plastic material sets up. The mold is removed, and there is formed around the handle portion of the bow a handgrip such as is shown in FIGURES 9 to 11 inclusive.

Referring to FIGURE 16, it will be seen that the walls of the mold are relatively thin and, referring to FIGURES 13 to 15, it will be seen that the outer surface of the mold parallels the inner surface of the mold cavity 39. Therefore, after the mold is assembled on the bow, an archer can grip the mold and thereby closely approximate the feeling in his hand of the finished handgrip. The mold can then be adjusted by turning the screws 35 so that the mold is in the desired alignment with the bow. Also, the mold can be turned about the longitudinal axis of the bow, as was explained in the discussion of FIGURE 12 of the drawings.

After a bow grip has been manufactured as just described, it can be made to fit almost exactly the hand of any individual archer when it is spread by the force of the drawn bow. This is done by placing a thin layer of moldable material on the surface of the body portion 23 and having the archer pull the bowstring in the same manner as was described with reference to the handgrip shown in FIGURES 1 to 6 inclusive.

From the foregoing, it is apparent that I have invented a bow grip which will improve the shooting accuracy of all archers. The grip makes it easy for the archer to hold the bow in the straight wrist position and he can hold this position for much longer periods of time than have heretofore been possible so that he has ample time to properly aim an arrow. Likewise, he can hold the bow steady while aiming and shooting and he can prevent forward "creeping" of the arrow. The ease provided by my grip for holding the bow in the proper position enables the archer to concentrate on the release or "loose" of the arrow, which plays a very important part in the flight of an arrow.

The force of the bow is distributed across the hand of the archer and against both bones in his forearm. The archer can therefore readily hold the bow so that his hand, wrist, arm and shoulder are lying substantially in a straight line.

The handgrip which I have invented which has a base extending completely around the bow has several advantages. It does not require any bolts or screws which pass into the bow and which might weaken the bow. It can be made to fit exactly the requirements of any individual archer. On the other hand, it can be readily adapted to mass production of bows. It is particularly advantageous in that it does not require any special preparation of the handle portion of any bow before the grip is applied.

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I have described my handgrip as a structure which is attached to a bow. However, it will be appreciated that the grip could be made an integral part of a bow by shaping the handle portion of a bow to provide a base and a body portion extending from the base to the palm of an archer's hand opposite to his thumb when the archer is gripping the bow in the "straight wrist" position.

The process which I have invented for making the above grip wherein an exact replica is made of the hand of an archer when flattened under the pressure of the bow insures that an archer will always grasp the bow in the same manner for shooting. The grip is also much more comfortable for the particular archer for which it has been made than bow handles heretofore made.

While I have described certain presently preferred embodiments of my invention, it is to be understood that it may be otherwise embodied within the scope of the appended claims.

I claim:

1. A handgrip for a bow comprising a base portion extending across the string side of the handle portion of the bow and along each side of said handle portion and a body portion extending rearwardly from the base, said body portion having means sloping downwardly and rearwardly from the vicinity of the top of the base to such length and in such width as to engage substantially all of an archer's palm when he is holding the bow in straight wrist shooting position, and thereby transmit a portion of the load of the drawn bow to the heel of the archer's hand.

2. A handgrip for a bow as defined in claim 1 in which the base portion is U-shaped extending across the string side of the bow and along a portion of each side of the bow.

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JAMES W. LOVE, *Examiner.*