May 13, 1952 B. N. FRISCH 2,596,894

COMPOSITE LAMINATED LACROSSE STICK

Filed May 4, 1948 2 SHEETS—SHEET 1

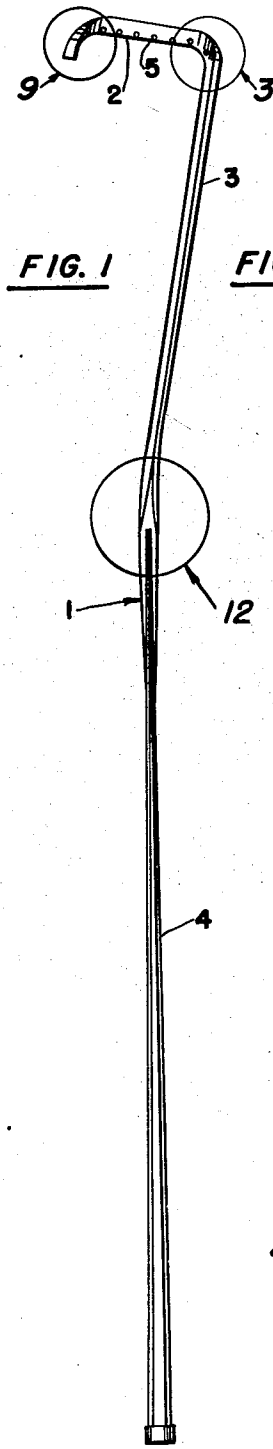


FIG. 1

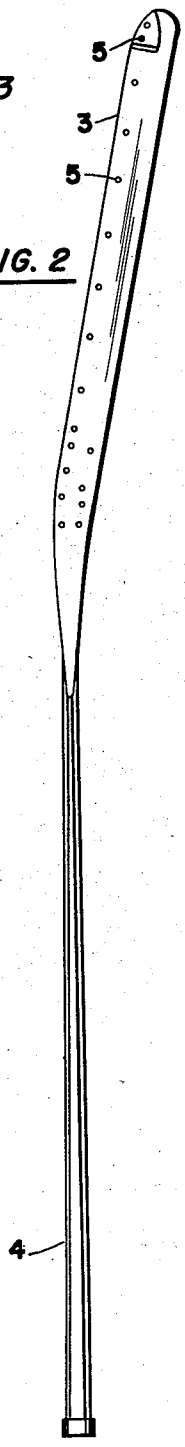


FIG. 2

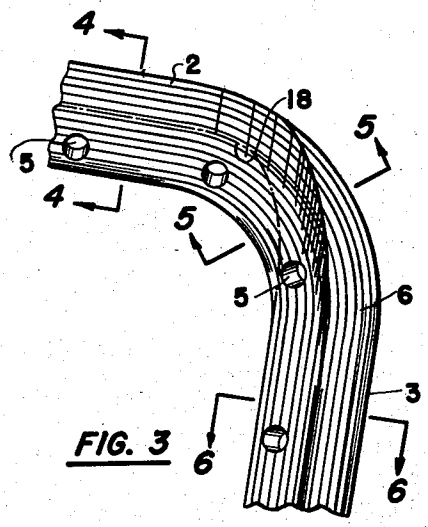


FIG. 3

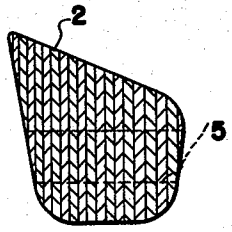


FIG. 4

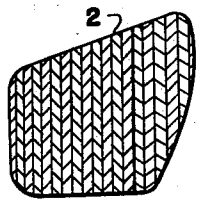


FIG. 5

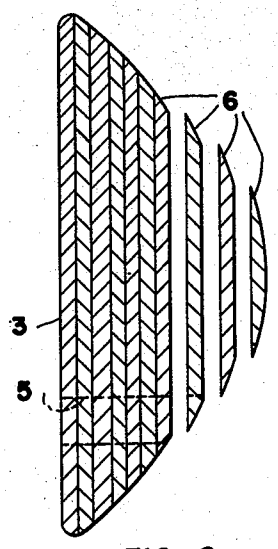


FIG. 6

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COMPOSITE LAMINATED LACROSSE STICK

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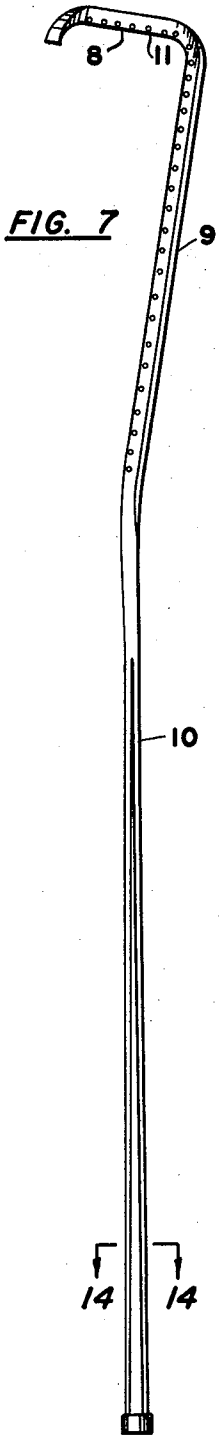


FIG. 7

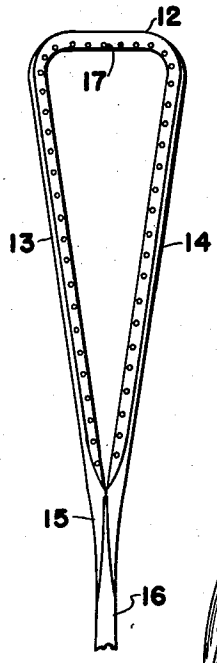


FIG. 8

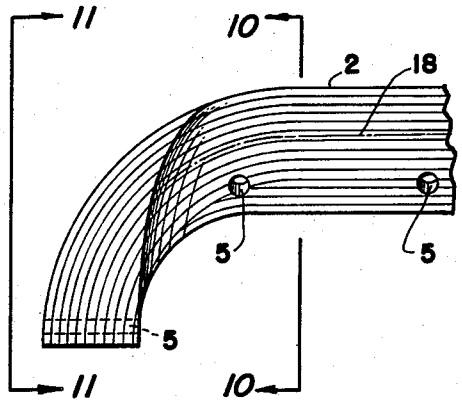


FIG. 9

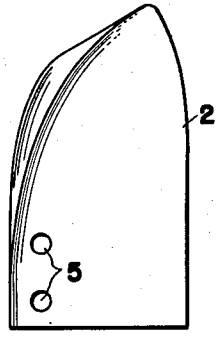


FIG. 11

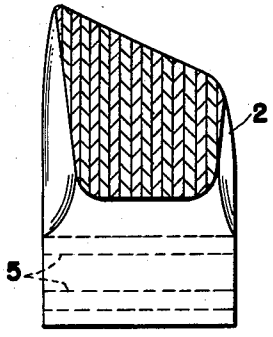


FIG. 10

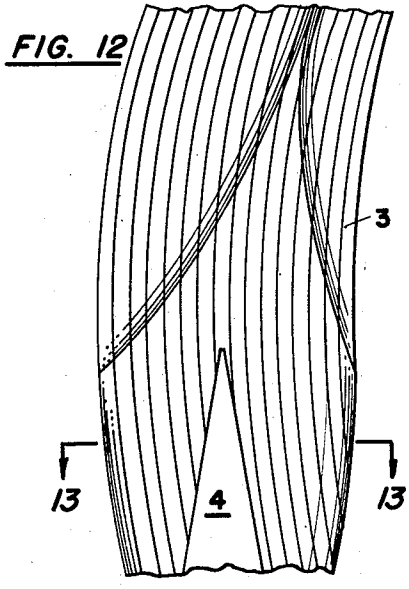


FIG. 12

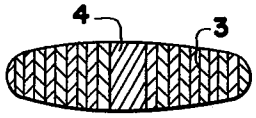


FIG. 13

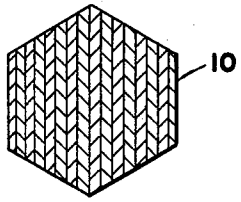


FIG. 14

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UNITED STATES PATENT OFFICE

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COMPOSITE LAMINATED LACROSSE STICK

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Application May 4, 1948, Serial No. 24,969

1 Claim. (Cl. 273—96)

1

This invention relates to the manufacture of lacrosse sticks and particularly to the process wherein the lacrosse stick is composed, either in whole or in part, of thin layers of wood or other suitable material, henceforth to be termed laminates, thus presenting a bonded assembly that may be readily bent or worked to varying lengths, weight and balance.

The means heretofore used in the manufacture of lacrosse sticks have proved to be both costly and inefficient, in regards to material and labor required, as well as the results obtained in the finished product. Since the wood used in this process must be of a type being of long fibre species, amenable to steaming and bending, precise care must be exercised in the selection of said material. The fact that this wood type is not found in sufficient quantity, within the continental borders of the United States, has forced the manufacturer to make his procurements abroad, thus incurring additional expense. Further, the length of the handle of the conventional stick is limited to the extremities established by the material used. Thus it may be shortened, to suit the individual player's preference, but the player desiring a handle longer than that found on the aforesaid stick must remain dissatisfied.

Another disadvantage of the aforementioned means of production concerns the procedure of bending said sticks to conform to the outline defined by the regulations governing the game and its subsequent equipment. After the wood rail has been carved or worked to the desired lineal contours, it is then subjected to steam, thus creating a state suitable for bending and shaping of the crosse or head. The bending must be performed by hand, with the final results depending upon the skill of the craftsman. In the bending process, many stresses are set up in the material structure, often causing the wood to crack and render the entire piece unusable. The high bending stresses that have been lock-in in the affected areas will tend to weaken the structure at these points and thus cause the crosses to crack when subjected to the rugged use encountered in the game.

A further disadvantage concerning the formation of the head, hereafter to be called the "crosse," is that the dimension between the inside wall of the frame and the inside wall of the bent end of the crosse should be of a value conforming to that prescribed in the rules of the game. The maintaining of this dimension has been found to be an utter impossibility, in actual practice, due to the natural differences in the fibre composition of the wood as well as the existence of human error on the part of the person performing this operation. Consequently, the weaving of the net and gut wall, which is attached to the frame and crosse, must be forestalled until the completion of the sticks, so that the aforementioned dimension of the crosse may be checked. The net and gut wall is then woven to this specification with the resultant of time and greater economy that would be attained through the mass production of said nets, either prior to or at the time of the formation of the sticks.

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The present invention therefore contemplates the use of a wood more common to this country, thereby eliminating the need for importing of the same and the subsequent costs. By the use of a laminated stick, it is possible to obtain better balance and weight features, because the cross sectional areas at various points may be more readily controlled. The completed stick has a handle of sufficient length to satisfy the most extreme lineal desire, without causing additional manufacturing problems or materially affecting the cost.

The invention further contemplates the introduction of a means for the more economical manufacture of lacrosse sticks by the using of different grades of wood, or other suitable material, in the laminae composing the stick. This is accomplished by using laminae of lesser grade on the inner portion of the frame and crosse and using a laminae of better quality on the outer side of the said frame and crosse. By means of this combination, material cost is held to a minimum, without sacrificing strength at the points of greater stress. The individual lamina may be dyed different colors, thus producing a finished product of highly decorative proportions. Through the proper selection of laminae for grain direction and through the careful arrangement of the succeeding lamina to obtain a crossed grain, the opportunity of splitting along a grain line is eliminated.

The invention further contemplates to provide a means for the bending and formation of the crosse and at the same time guarantees a constant dimension for the distance between the inner frame wall and the bent end of the crosse. In the process of bending, the radius or degree of bend may be executed to predetermined amount without setting up high bending stresses, since each successive lamina takes a portion of the total stress. The fact that a bend may be so regulated, insures a constant crosse length, thereby enabling the manufacturer to have the

net and gut wall put into mass production immediately. Having this crosse dimension become a standard, makes the net and gut wall interchangeable. Prior to this net, if the original stick was unserviceable it was discarded if another stick of the same crosse dimension could not be purchased.

The invention further contemplates to provide a stick of an adhesive bonded assembly of laminates constructed, either as a complete unit, comprising the crosse, frame and handle, or it consists of a laminated crosse and frame suitably joined to a conventional handle.

The various objects of the invention will be clear from the description which follows, and from the drawings, in which

Figure 1 is a front elevation of a lacrosse stick having a laminated frame and solid handle;

Figure 2 is a left side elevation of the lacrosse stick shown in Figure 1;

Figure 3 is an enlarged fragmentary view of the encircled area **3** in Figure 1;

Figure 4 is a transverse section taken on the line **4—4** of Figure 3;

Figure 5 is a transverse section taken on the line **5—5** of Figure 3;

Figure 6 is a transverse section taken on the line **6—6** of Figure 3, having laminae of the outer portion partially exposed;

Figure 7 is a front elevation of a lacrosse stick of entirely laminated construction;

Figure 8 is a partial front elevation of a lacrosse stick having two sides forming the net enclosure;

Figure 9 is an enlarged fragmentary view of the encircled area **9** in Figure 1;

Figure 10 is a transverse section taken on the line **10—10** of Figure 9;

Figure 11 is an end elevation of the crosse, taken on the line **11—11** of Figure 9;

Figure 12 is an enlarged fragmentary view of the handle junction shown in the encircled area **12** of Figure 1;

Figure 13 is a transverse section taken on the line **13—13** of Figure 12; and

Figure 14 is a transverse section taken on the line **14—14** of Figure 7.

In the practical embodiment of the invention shown by way of example, the stick **1** is composed of a laminated head or crosse **2**, a laminated frame **3**, and a solid type handle **4**. The crosse **2**, and the frame **3**, contain holes **5**, which provide a convenient means for attaching a conventional net and gut-wall assembly not shown. It will be noted that the laminae **6**, shown in Figure 3, are parallel to the length of the stick.

During the process of manufacture, the lamina is bonded one to the other to form an assembly of such proportions as to be suitable for the shaping of the entire stick, while in a straight position, that is, before bending. Upon the completion of the preliminary forming operations, the crosse is then bent to a specified size and contour. This is accomplished by a conventional steaming process and as previously mentioned, the setting up of high bending stresses is considerably lessened, since each successive lamina takes a portion of the total stress. Following the bending procedure, the stick is then worked to its final shape, as depicted by the cross sections shown in Figures 4, 5 and 6, then weighed and tested for balance.

The junction of the laminated frame **3** and the solid handle **4**, of the stick **1** illustrated in Figure 1, is shown in larger detail in Figure 12, wherein the method used is the conventional "fish mouth" joint, which by the contouring of one element into the other and the subsequent treating of the same with an adhesive substance, will result in a joint of equal or greater strength than the solid material of the stick.

The modified form of the lacrosse stick **7**, shown in Figure 7, is of an entirely laminated construction, comprising a crosse **8**, a frame **9**, and a handle **10**, and holes **11**, suitably spaced, about the crosse and frame, for the convenient attachment of the net and gut-wall.

Figure 8 shows a further modified form embodying an upper portion of a lacrosse stick, having a crosse **12**, frames **13** and **14**, forming a union **15**, with the partially shown handle **16**. As in previous forms shown, holes **17**, of suitable diameter and spacing have been drilled in the crosse and frames, to facilitate the attachment of the net and gut-wall. The additional frame, in lieu of the normally open side, greatly adds to the overall strength of the stick, protecting further against cracking while in use. The frames **13** and **14**, in conjunction with the crosse **12**, are composed of laminated section, shaped and then bent, by means of the steaming process, to conform to the outline shown in Figure 8. The union **15**, wherein the frames **13** and **14** are bonded to the handle **16**, is of the conventional predescribed "fish mouth" type. The handle **16**, of this form, may be either of laminated construction, or of a solid wood rail.

Figs. 3 and 9, show enlarged fragmentary views of the extremities of the crosse **2**. In Figure 3, the arc connecting the frame **3** and the crosse **2** is shown, as well as the characteristics of the general contouring involved. Figure 9, shows the opposite end of the crosse **2** and its subsequent contour characteristics. The area defined within the dot-dash outline **18**, may be either laminated or of a solid material, depending upon prevailing conditions of manufacture, or at the discretion of the user. In using a solid material, within this area, it is first fashioned to the desired shape and adhesively applied to the existing laminated crosse **2**.

It will be readily seen that by this means of lacrosse stick construction, an appreciable degree of economy, of materials and labor, is attained, due to the fact of the introduction of varying grades of material composition, reduction of the risk of splitting, of said stick, during the bending, in addition to the standardization of the inside crosse dimension.

It will also be seen that the provision of a handle of superflous length will meet the requirements of the most extreme choice on the part of the user, without creating difficulties or added cost in manufacture.

In summation, it will therefore be seen that the introduction of mass production, of the net and gut-wall assembly, a heretofore impossibility due to variations of the crosse length, will entail an enormous saving in the production time of the entire unit, as well as representing a satisfactory reduction in the cost to the consumer.

While I have shown and described certain specific embodiments of my invention, I do not wish to be understood as limiting myself thereto, but intend to claim the invention as broadly as may be permitted by the state of the prior art and the scope of the appended claim.

I claim:

A lacrosse stick comprising a handle of solid material, a frame of laminated material joined

to said handle, the top horizontal portion of said frame twisted at right angles to the side portion of said frame to form an extending arm, the free end of said arm bent at a right angle thereof, whereby said twisted laminations provide a durable structure.

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