



US 20070184923A1

(19) **United States**

(12) **Patent Application Publication**  
**Morrow**

(10) **Pub. No.: US 2007/0184923 A1**

(43) **Pub. Date: Aug. 9, 2007**

(54) **LACROSSE HANDLE**

**Publication Classification**

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(51) **Int. Cl.**  
**A63B 59/02** (2006.01)

(52) **U.S. Cl.** ..... **473/513**

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(57) **ABSTRACT**

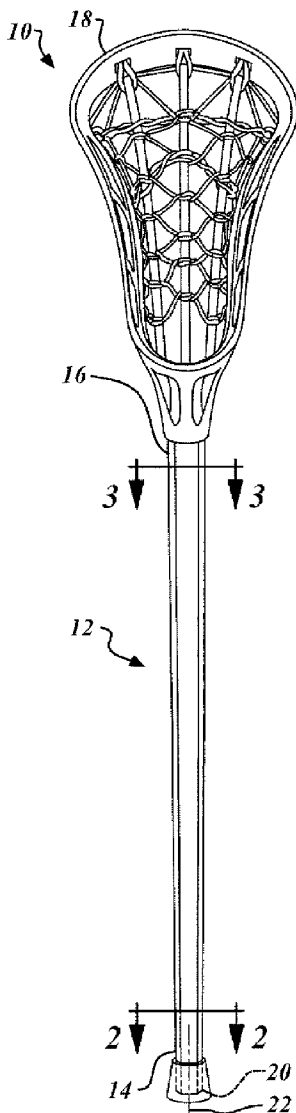
In one embodiment, an improved handle (12) for attachment to a lacrosse head (10) is provided. The improved handle (12) includes a generally tubular member (14) having a top end (16) for attachment to a lacrosse head (18) and a bottom end (20) opposite thereto. The top end (16) and the bottom end (20) have a longitudinal reference line (22) extending generally therebetween. The lateral width of one portion of the generally tubular member (14) is larger than the lateral width of another portion of the generally tubular member (14), which is offset from the first portion along the longitudinal reference line (22).

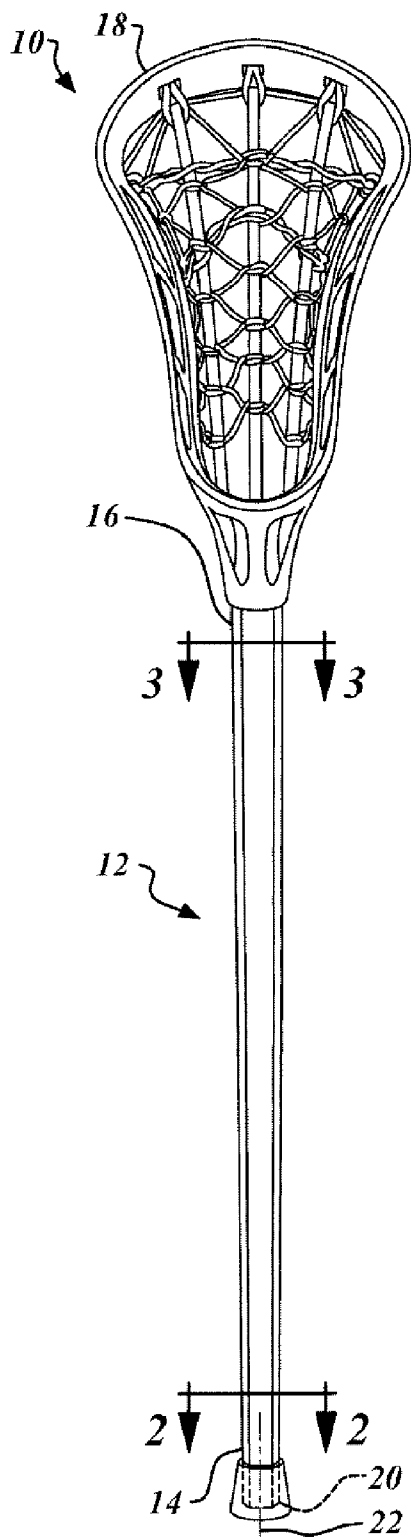
(21) Appl. No.: **10/907,912**

(22) Filed: **Apr. 20, 2005**

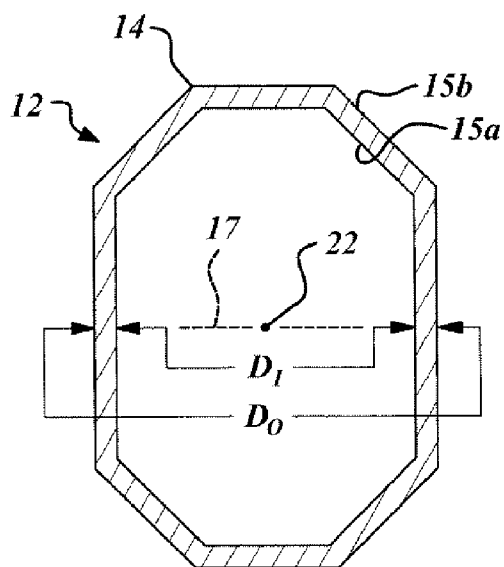
**Related U.S. Application Data**

(60) Provisional application No. 60/563,870, filed on Apr. 20, 2004.

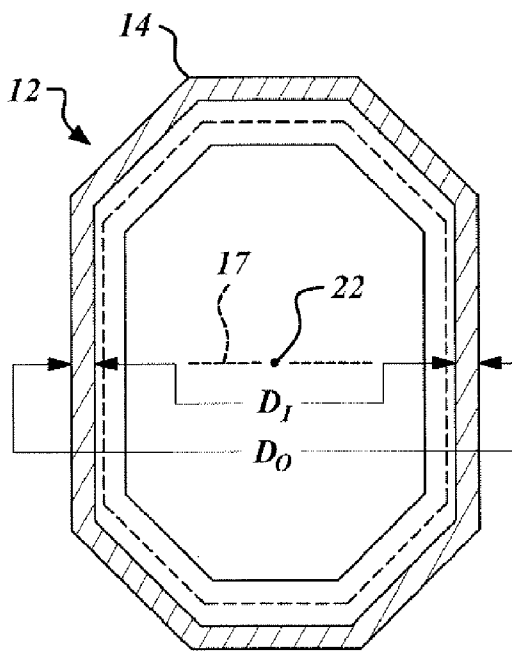




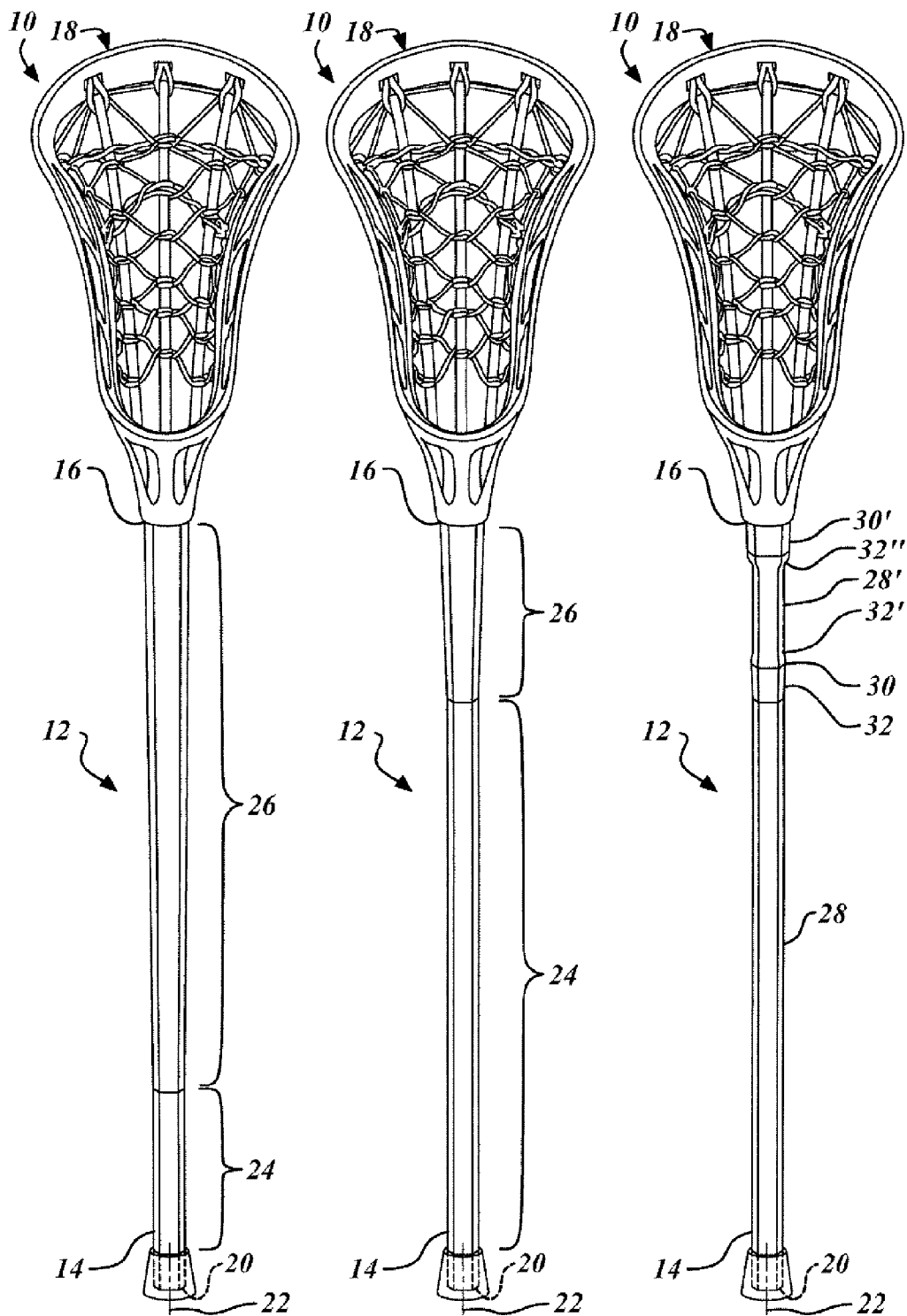
**FIG. 1**



**FIG. 2**



**FIG. 3**



**FIG. 4**

**FIG. 5**

**FIG. 6**

**LACROSSE HANDLE**

**CROSS-REFERENCE TO RELATED APPLICATION**

[0001] This application claims the benefit of U.S. Provisional Application No. 60/563,870, filed on Apr. 20, 2004, entitled "Tapered Lacrosse Handle," and is a continuation-in-part of U.S. Non-Provisional application Ser. No. 10/906,734, filed on Mar. 3, 2005, entitled "Improved Handle For Attachment To A Lacrosse Head," which are both incorporated herein by reference.

**TECHNICAL FIELD**

[0002] The present invention relates generally to lacrosse equipment, and more particularly to an improved handle for attachment to a lacrosse head.

**BACKGROUND OF THE INVENTION**

[0003] Lacrosse manufacturers increasingly develop equipment for improving a player's performance in the game. One significant development was the introduction of lacrosse handles having a hollow metal tube construction. These metal handles were developed to replace prior wooden handles, which were susceptible to water damage and were somewhat heavy and cumbersome. To that end, the current hollow metal handles are typically comprised of aluminum or titanium and provide durable constructions that enhance a player's ability to manipulate and carry the handle.

[0004] A typical hollow metal handle is an extrusion having a uniform lateral cross-section across the length of the handle. This construction typically does not provide tactile feedback as to the position of the player's hands on the handle. For instance, a defensive player having a stick with a relatively long handle would not know if he is holding a top portion, a bottom portion, or a middle portion of the handle without first visually inspecting the handle.

[0005] One of ordinary skill in the art will understand that informing the player about the position of his hands on the handle without requiring visual inspection can enhance his ability to play the game. Specifically, it is understood that the position of a player's hands can determine how the player cradles, passes, or shoots the ball. In other words, the player can grip a portion of the handle best suited for handling or throwing the ball in a predetermined manner.

[0006] In addition, it is also understood that a player can use his sight for obtaining a clear vision of the field, e.g. identifying which teammates are open or will be open to receive his pass.

[0007] It would therefore be desirable to provide a lacrosse handle that improves a player's perception of the field while maintaining his ability to throw or pass the ball in a desired way.

**SUMMARY OF THE INVENTION**

[0008] It is therefore one advantage of the present invention to provide an improved handle for attachment to a lacrosse head that provides tactile feedback as to the position of a player's hands on the handle.

[0009] It is another advantage of the present invention to provide an improved handle for attachment to a lacrosse head that has a relatively strong construction for resisting fractures or other breakage.

[0010] It is yet another advantage of the present invention to provide an improved handle for attachment to a lacrosse head that is substantially lightweight for conserving a player's energy and enhancing his ability to perform in the game.

[0011] It is still another advantage of the present invention to provide an improved handle for attachment to a lacrosse head that is resistant to corrosion and/or other damage, e.g. damage caused by exposure to water.

[0012] In accordance with the above and other advantages of one embodiment of the invention, an improved handle for attachment to a lacrosse head is provided. The improved handle includes a generally tubular member having a top end for attachment to a lacrosse head and a bottom end opposite the top end. The top end and the bottom end have a centerline axis extending generally therebetween as a longitudinal reference line. Furthermore, the elongated generally tubular member has a lateral reference line extending through the longitudinal reference line. The lateral reference line is positioned in a predetermined orientation for assisting in defining an inner diameter and an outer diameter of the tubular member.

[0013] Specifically, in this embodiment, the elongated generally tubular member is a hollow tube construction with an inner surface and an outer surface. The inner surface has opposing sides, as viewed along the lateral reference line, for defining the inner diameter. Similarly, the outer surface has opposing sides, as viewed along the lateral reference line, for defining the outer diameter. This outer diameter varies in dimension across the longitudinal reference line for providing tactile stimulation.

[0014] Other advantages of the invention will become apparent when viewed in light of the detailed description in conjunction with the attached drawings and appended claims. Also, it is contemplated that the features, the functions, and the advantages can be achieved independently and in various embodiments of the present invention or may be combined in yet other embodiments.

**BRIEF DESCRIPTION OF THE DRAWINGS**

[0015] For a more complete understanding of this invention, reference should now be made to the embodiments illustrated in greater detail in the accompanying drawings and described below by way of examples of the invention:

[0016] FIG. 1 is a top plan view of an improved handle for attachment to a lacrosse head, according to one advantageous embodiment of the claimed invention.

[0017] FIG. 2 is a cross-sectional view of the handle shown in FIG. 1 as taken along line 2-2.

[0018] FIG. 3 is a cross-sectional view of the handle shown in FIG. 1 as taken along line 3-3.

[0019] FIG. 4 is a top plan view of an improved handle for attachment to a lacrosse head, according to another advantageous embodiment of the claimed invention.

[0020] FIG. 5 is a top plan view of an improved handle for attachment to a lacrosse head, according to yet another advantageous embodiment of the claimed invention.

[0021] FIG. 6 is a top plan view of an improved handle for attachment to a lacrosse head, according to still another advantageous embodiment of the claimed invention.

#### DETAILED DESCRIPTION OF THE INVENTION

[0022] In the following figures, the same reference numerals are used to identify the same or similar components in the various views.

[0023] The present invention is particularly suited for an improved handle having a “baseball bat-like” construction for providing tactile feedback regarding the position of a player’s hands on the handle. For this reason, the illustrated embodiments described herein have features as the context permits. However, as exemplified in FIGS. 4 through 6, it will be appreciated that the improved handle can have various other suitable constructions for providing tactile feedback as desired. In this respect, a variety of other embodiments are contemplated having different combinations of the described features, having features other than those described herein, or even lacking one or more of those features. The disclosed handle is preferably intended for the game of lacrosse. However, the handle may also be utilized for other sports.

[0024] Referring to FIG. 1, there is shown a lacrosse stick 10 including an improved handle 12, according to one advantageous embodiment of the claimed invention. This handle 12 gradually tapers in width at a constant rate across its length. However, it is contemplated that the handle 12 may instead taper or thicken across its length at a variable rate or otherwise vary in grade as desired.

[0025] This handle 12 is comprised of an elongated generally tubular member 14 with a top end 16 for attachment to a lacrosse head 18 and a bottom end 20 opposite thereto. The top end 16 and the bottom end 20 have a longitudinal reference line 22 extending generally therebetween. The longitudinal reference line 22 preferably defines the length of the handle 12. In an embodiment where the handle 12 is straight, this line 22 extends along the centerline of the tubular member 14.

[0026] Furthermore, the tubular member 14 has a lateral reference line 17 extending through the longitudinal reference line 22. The lateral reference line 17 is positioned in a predetermined orientation for assisting in defining an inner diameter  $D_I$  and an outer diameter  $D_O$  of the tubular member 14.

[0027] Specifically, in this embodiment, the tubular member 14 is a hollow tube with an inner surface 15a and an outer surface 15b. The inner surface 15a has opposing sides, as viewed along the lateral reference line 17, for defining the inner diameter  $D_I$ . Similarly, the outer surface 15b has opposing sides, as viewed along the lateral reference line 17, for defining the outer diameter  $D_O$ . This outer diameter  $D_O$  varies in dimension as taken along the longitudinal reference line 22 so as to provide tactile feedback regarding the position of the player’s hands on the handle 12.

[0028] In this embodiment, as best shown in FIG. 3, the tubular member 14 has an outer diameter  $D_O$  near the top end 16 of the handle 12 that is substantially larger than the outer diameter  $D_O$  near the bottom end 20 of the handle 12. Put another way, the lateral cross-section of the handle 12

increases in its peripheral dimension along a general direction from the bottom end 20 toward the top end 16 of the handle 12. In this respect, the thickness of the tubular member 14 can inform the player as to the location of his hands on the handle 12.

[0029] For instance, as shown in FIG. 2, a relatively thin portion can provide tactile feedback indicating that the player’s hand is located near a bottom end 20 of the handle 12. Likewise, turning to FIG. 3, a relatively thick portion provides tactile feedback indicating to the player that his hand is near the top end 16 of the handle 12. In this vein, the handle 12 eliminates the need for the player to visually inspect the handle 12. As explained hereinabove, this feature is beneficial for enhancing a player’s vision of the field and maintaining his ability to manipulate and carry the handle 12.

[0030] However, it will be appreciated that the tubular member 14 can vary across the longitudinal reference line 22 in various other ways for providing tactile feedback.

[0031] Referring now to FIGS. 4 through 6, there are shown exemplary constructions of the handle 12, according to other advantageous embodiments of the claimed invention.

[0032] With regard to the embodiment shown in FIG. 4, the handle 12 has an overall length comprised of a bottom length portion 24 with a substantially constant outside diameter and a top length portion 26 extending from the bottom length portion 24. The top length portion 26 has an outside diameter  $D_O$  that gradually increases toward the top end 16 of the handle 12.

[0033] In this embodiment, the bottom length portion 24 extends across a substantially shorter length of the handle 12 than the top length portion 26. In this way, for instance, the bottom length portion 24 can provide tactile stimulation for indicating where the player can position his hands for shooting the ball. It will be appreciated that this construction provides various other advantages.

[0034] Regarding the embodiment shown in FIG. 5, the bottom length portion 24 having the substantially constant outside diameter  $D_O$  extends across a substantially longer length of the handle 12 than the top length portion 26. In this instance, the top length portion 26 provides tactile feedback as to the player’s hand being located near the top end 16 of the handle 12. In that regard, for example, the player can feel where to place his upper hand for cradling the ball.

[0035] This advantage is also accomplished by another embodiment exemplified in FIG. 6. In this embodiment, the length of the handle 12 includes two generally thin portions 28, 28’ adapted for being gripped by a player’s hands, two generally thick portions 30, 30’ having a larger girth than that of the generally thin portions 28, 28’, and three transition portions 32, 32’, 32’’ therebetween.

[0036] Specifically, a first thin portion 28 has a substantially constant girth and extends from the bottom end 20 toward the top end 16 of the handle 12. This portion 28 has a first transition portion 32 extending therefrom with a variable girth gradually increasing toward the top end 16. Furthermore, the first transition portion 32 has a first thick portion 30 extending therefrom toward the top end 16.

[0037] In this embodiment, the first thick portion 30 comprises a substantially short length of the handle 12 as a second transition portion 32' extends therefrom substantially close to the first transition portion 32. This second transition portion 32' has a variable girth abruptly decreasing toward the top end 16 of the handle 12 and terminating at a second thin portion 28'.

[0038] The second thin portion 28' has a substantially constant girth dimensioned similar to that of the first thin portion 28. In this respect, the second thin portion 28' can provide tactile feedback as to where the player can locate his upper hand on the handle 12 for cradling the ball. Moreover, the second thin portion 28' has a third transition portion 32" extending therefrom with a variable girth abruptly increasing toward the top end 16. This steep increase in girth can stop a player's hand quickly sliding up the handle 12. In this respect, the handle 12 can assist the player in positioning his hand without the player consciously stopping his hand in the desired location. Finally, from the third transition portion 32" extends a second thick portion 30'.

[0039] Referring back to FIG. 1, the tubular member 14 is in the form of a one-piece hollow metal construction. For instance, the tubular member 14 can be constructed of aluminum or titanium material by a hydroforming process. However, it will be appreciated that the tubular member 14 can instead be comprised of two or more components of a composite laminate, a plastic, various other suitable materials, or any combination thereof. Likewise, it is contemplated that the tubular member 14 can be produced by an injection molding process, a pressing process, a swaging process, an extrusion process, various other suitable manufacturing processes, or any combination thereof. Further, the tubular member 14 can take on a variety of different shapes and lengths as desired.

[0040] While particular embodiments of the invention have been shown and described, numerous variations and alternate embodiments will occur to those skilled in the art. Accordingly, it is intended that the invention be limited only in terms of the appended claims.

What is claimed is:

- 1. A handle for attachment to a lacrosse head, comprising:
  - an elongated generally tubular member having a top end for attachment to a lacrosse head and a bottom end opposite to said top end, said elongated generally tubular member further having hollow tube construction with an inner surface and an outer surface;
  - a longitudinal reference line extending generally between said top end and said bottom end of said elongated generally tubular member; and
  - a lateral reference line extending generally perpendicularly through said longitudinal reference line and having a predetermined orientation for assisting in defining an inner diameter and an outer diameter of said elongated generally tubular member;

wherein said inner diameter is defined between opposing sides of said inner surface along said lateral reference line;

wherein said outer diameter is defined between opposing sides of said outer surface along said lateral reference line;

- wherein said outer diameter varies in dimension as taken across said longitudinal reference line.
- 2. The handle recited in claim 1 wherein said outside diameter near said top end of said elongated generally tubular member is larger than said outside diameter near said bottom end of said elongated generally tubular member.
- 3. The handle recited in claim 1 wherein said outside diameter gradually increases toward at least one of said top end and said bottom end elongated generally tubular member.
- 4. The handle recited in claim 1 wherein said outside diameter abruptly increases toward one of said top end and said bottom end.
- 5. The handle recited in claim 1 wherein said elongated generally tubular member has a length comprised of:
  - at least one generally-narrow portion adapted for being gripped by a hand;
  - at least one generally-wide portion having a larger outside diameter than that of said at least one generally-narrow portion; and
  - at least one generally-short portion in connection therewith with said outside diameter substantially increasing from said at least one generally-narrow portion to said at least one generally-wide portion.
- 6. The handle recited in claim 5 wherein said generally-narrow portion has a substantially constant outside diameter.
- 7. The handle recited in claim 5 wherein said generally-wide portion has a substantially constant outside diameter.
- 8. The handle recited in claim 1 wherein said elongated generally tubular member has at least one of a hydroformed construction, a pressed construction, a swaged construction, an extrusion construction, and an injection-molded construction.
- 9. A handle for attachment to a lacrosse head, comprising:
  - an elongated shaft having a top end for attachment to a lacrosse head and a bottom end opposite to said top end;

wherein said elongated shaft has a variable girth as taken along the length of said elongated shaft toward at least one of said top end and said bottom end.
- 10. The handle recited in claim 9 wherein said variable girth gradually increases toward at least one of said top end and said bottom end.
- 11. The handle recited in claim 9 wherein said variable girth abruptly increases toward at least one of said top end and said bottom end.
- 12. The handle recited in claim 9 wherein said elongated shaft has a length comprised of:
  - at least one generally-thin portion adapted for being gripped by a hand;
  - at least one generally-thick portion sized with a larger girth than said at least one generally-thin portion; and
  - at least one generally-short portion in connection therewith with said variable girth substantially increasing from said at least one generally-thin portion to said at least one generally-thick portion.
- 13. The handle recited in claim 12 wherein said generally-thin portion has a substantially constant girth.
- 14. The handle recited in claim 12 wherein said generally-thick portion has a substantially constant girth.

**15.** The handle recited in claim 9 wherein said elongated shaft is a single-piece structure.

**16.** The handle recited in claim 9 wherein said elongated shaft has at least one of a hydroformed construction, a pressed construction, a swaged construction, and an injection-molded construction.

**17.** A handle for attachment to a lacrosse head, comprising:

a hollow rod having a top end adapted for coupling to a lacrosse head, a bottom end opposite to said top end, and at least two length portions extending between said top end and said bottom end with one of said length

portions having a lateral cross-section sized larger than the other of said length portions.

**18.** The handle recited in claim 17 further comprising: at least one transition portion extending between said at least two length portions with said lateral cross-section substantially changing therebetween.

**19.** The handle recited in claim 17 wherein at least one of said length portions has a substantially constant lateral cross-section thereacross.

**20.** The handle recited in claim 17 wherein said hollow rod is a single-piece construction.

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