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(54) **WOMEN'S LACROSSE STICK HEAD**

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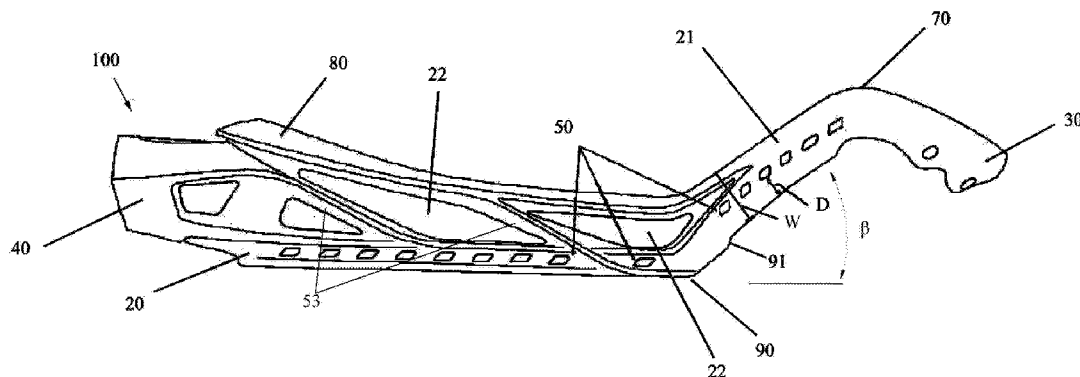
(57) **ABSTRACT**

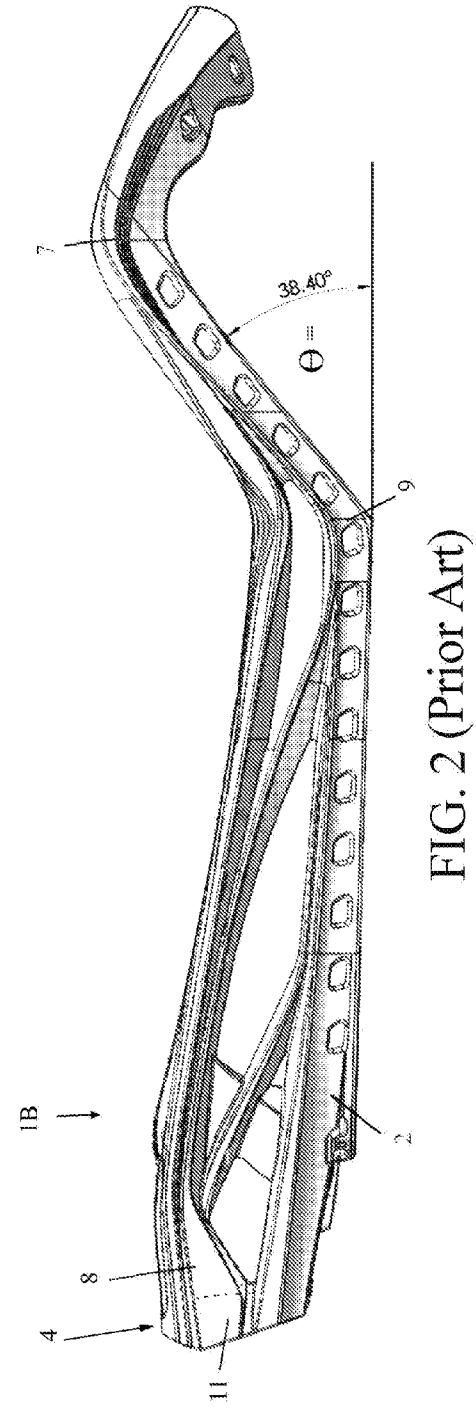
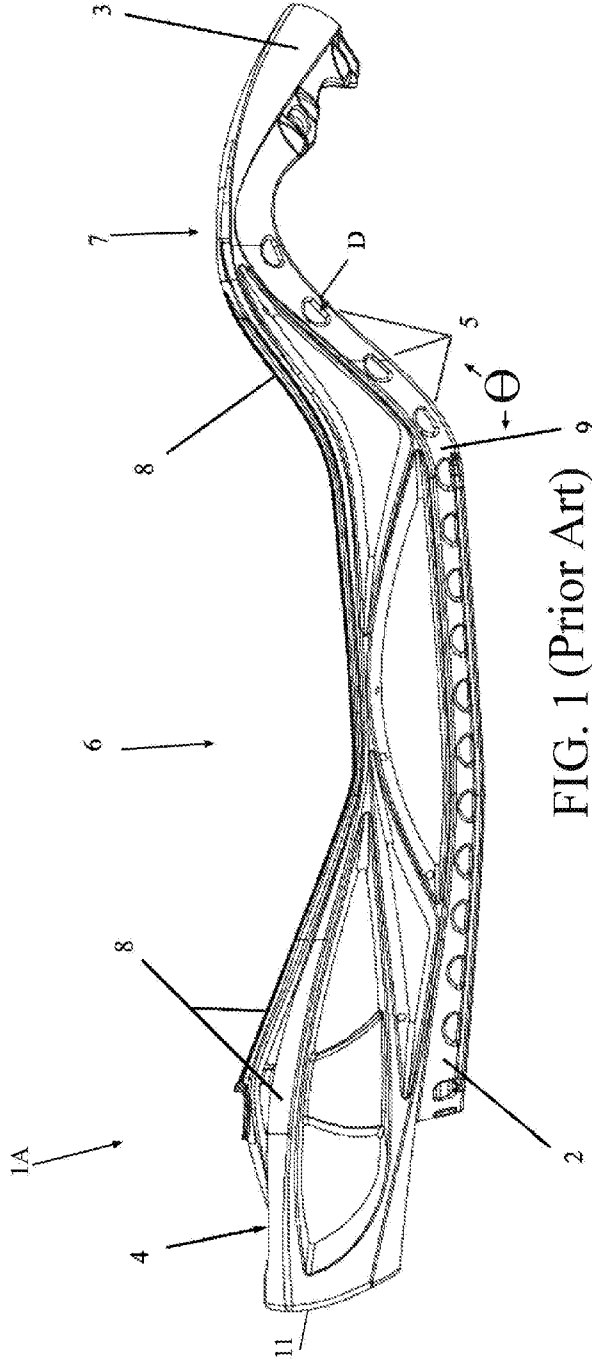
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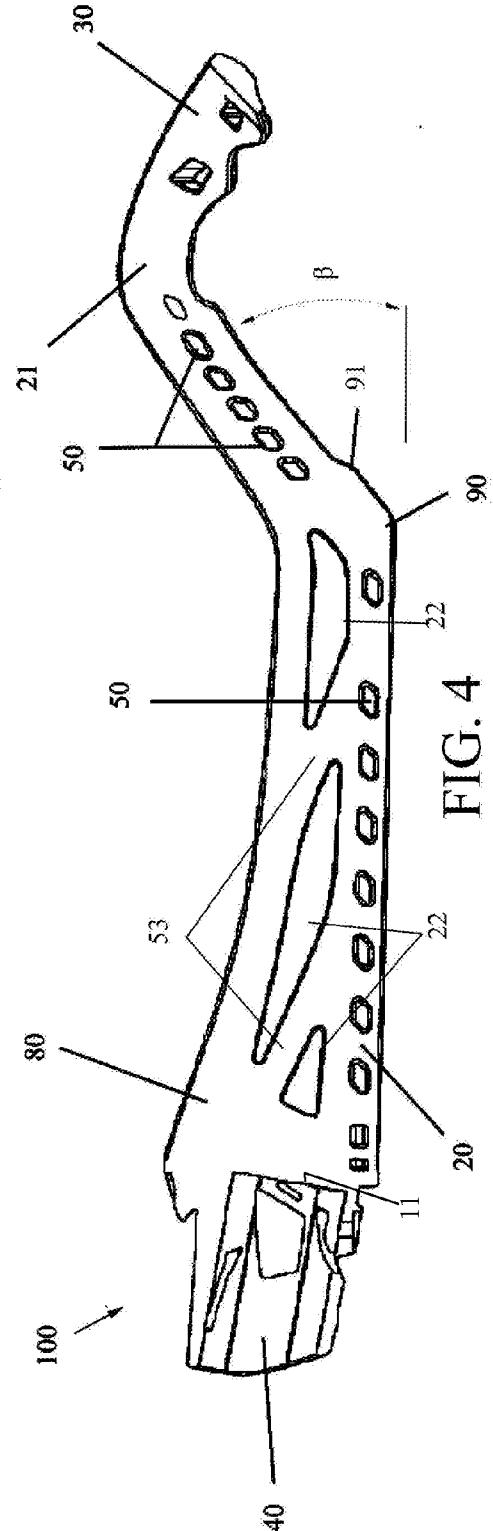
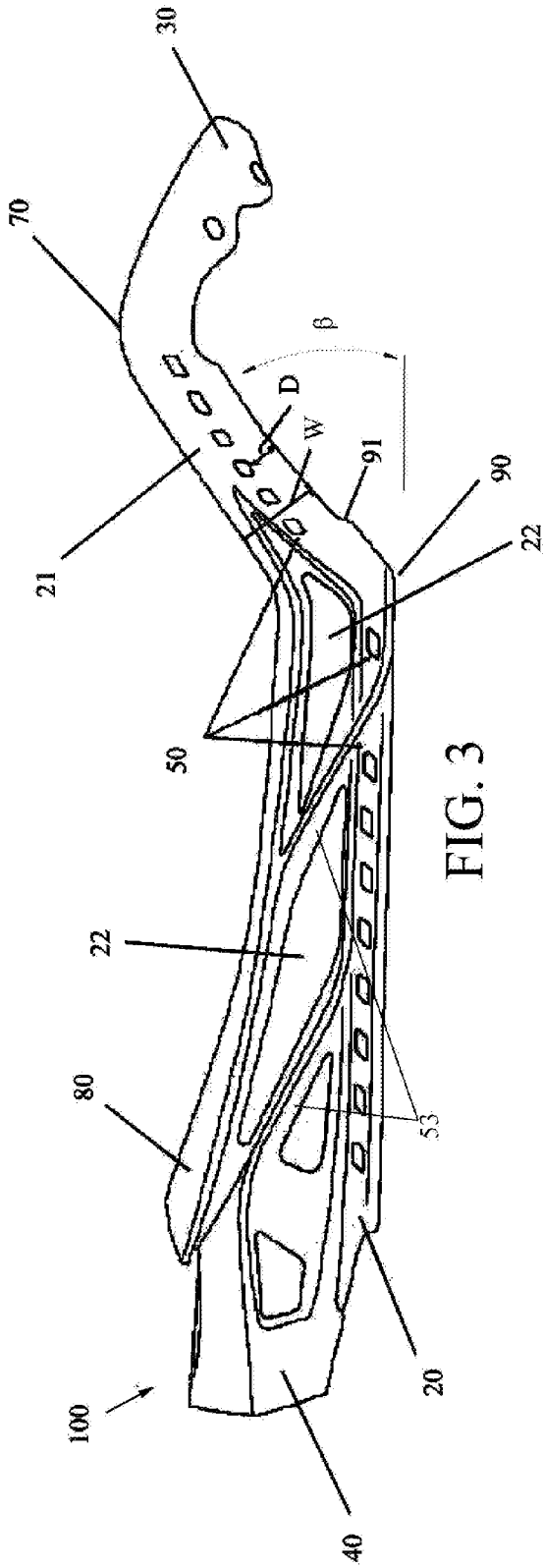
A head for attachment to a lacrosse stick is provided. The head has a protrusion feature on its back edge proximate the widest portion of the head and a stringing configuration to provide increased ball control when the ball is placed against the back of the head during a draw play. The head is additionally designed to allow the back of the head to seat inside the frame of the head of an opposing player's stick. The head is advantageously used for women's lacrosse games.

Related U.S. Application Data

(60) Provisional application No. 62/102,302, filed on Jan. 12, 2015.







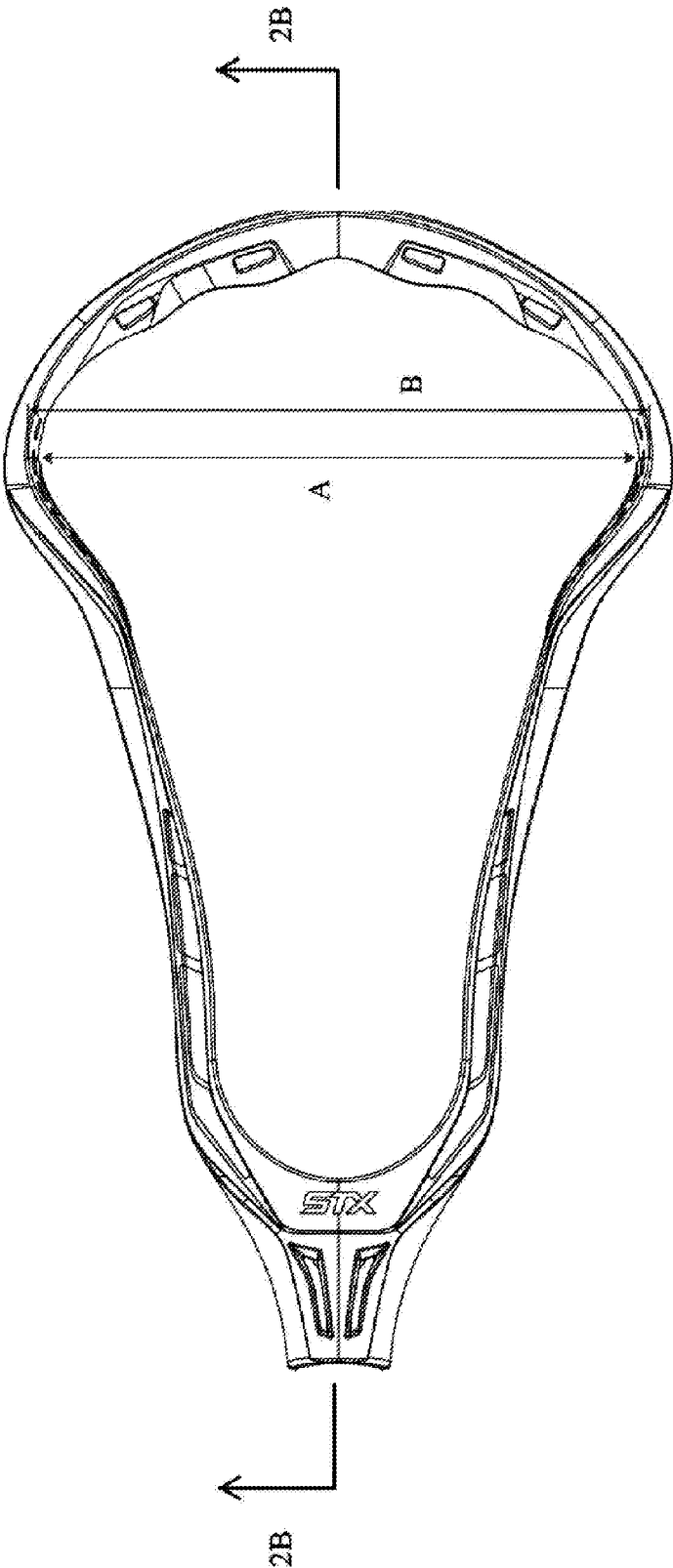


FIG. 5

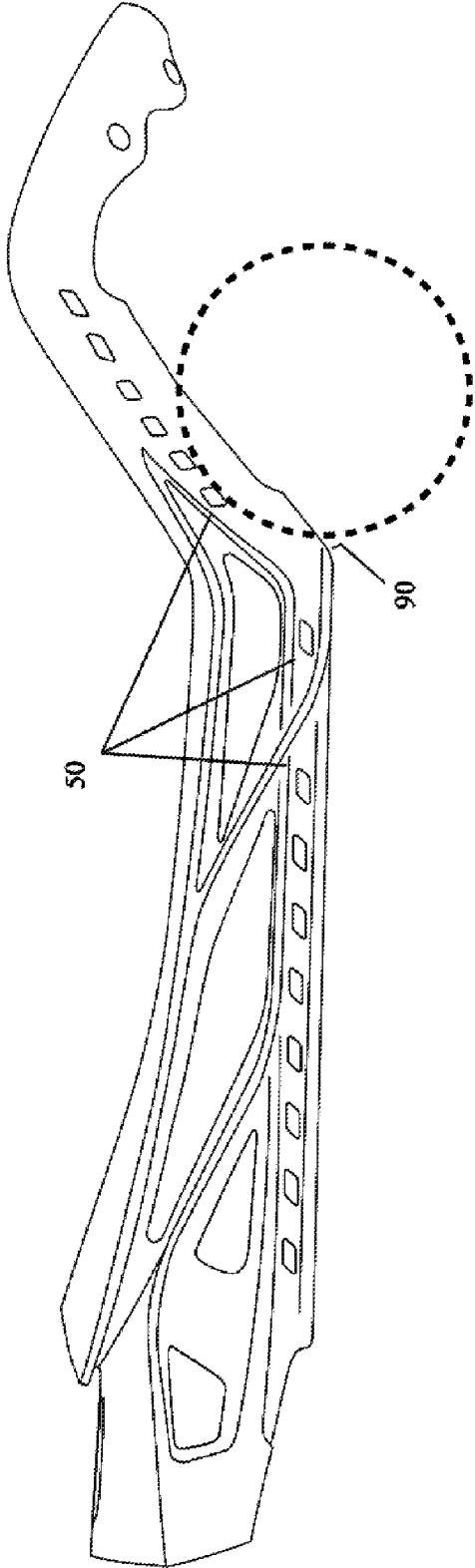


FIG. 6

WOMEN'S LACROSSE STICK HEAD**CROSS-REFERENCE TO RELATED APPLICATION(S)**

[0001] The present application derives priority from U.S. Provisional Patent Application Ser. No. 62/102,302 filed 12 Jan. 2015.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates to lacrosse and, more particularly, to an improved lacrosse stick head adapted for improved playing characteristics, especially in women's lacrosse.

[0004] 2. Description of the Background

[0005] In a typical women's lacrosse game, a draw occurs at the beginning of each period and after each goal is scored. The draw determines which team will have possession of the ball to begin a given period or after a goal. To prepare for the draw, one player from each team lines up in the middle of the "center circle", which is a circular demarcation defining the middle of the field and having a radius of 30 feet around the centerfield mark according to NCAA standards. Other players from each team may line up on their team's respective side of the field, as well as around the edges of the center circle, such that players from a given team may be positional on all sides of the center circle where the draw takes place.

[0006] To initiate a draw, the two opposing players at the centerfield mark position the heads of their lacrosse sticks "back to back" at waist height or above with the ball sandwiched between the backs of the two heads. Recent rule changes have mandated that the ball be placed closer to the scoop end of the lacrosse head (i.e. upper third) than the throat end. Upon the start of gameplay, usually indicated by the referee, each of the two players attempts to wrest the ball from the other's control to obtain possession of it for herself or her team. To do so, a player may catch the ball herself out of the air or attempt to propel the ball out of the center circle towards one of her teammates. Consequently, control over the ball is highly important for a successful draw maneuver. A successful draw is especially important in women's lacrosse because the rules of that game, as contrasted with the rules of men's lacrosse, make it more difficult for a player to gain possession of the ball from an opposing player, i.e. to force a turnover, without incurring a penalty unless the opposing player makes an error, has an unsuccessful shot on goal, or otherwise relinquishes the ball.

[0007] A side view of two conventional women's lacrosse heads 1A, 1B are illustrated in FIGS. 1-2, with like parts designated by like reference numbers. A lower rail 2 of a sidewall defines the lower perimeter of the heads 1A, 1B. When viewed from above heads 1A, 1B form roughly an inverted "bulb"-shape where the bottom of the bulb is formed by a curved transverse connecting wall, or scoop 3, and where the lateral sides of the bulb join opposite the scoop to form a ball stop member 11 and throat member 4, where the head 1 is joined to a lacrosse handle (not shown). Lower rail 2 further comprises a plurality of stringing holes 5 through which strings (not shown), typically made of nylon, are threaded between lateral sides and between scoop 3 and throat 4 to define a shallow pocket that lies generally in the same plane as lower rail 2. Reference character 6 indicates the pocket span between scoop 3 and throat member 4. In a

conventional women's lacrosse head, stringing holes 5 are positioned adjacent the base of lower rail 2 (e.g. 3 mm from the base), as denoted by reference character D in FIG. 1A. A portion of lower rail 2 accounting for approximately 2/3 of the overall length of head 1 proximate throat 4 may be slightly convex relative to the pocket side of head 1 (facing the bottom of the page). Thus, lower rail 2 aids in defining the shape of the pocket 6. In certain head models, a portion of lower rail 2 accounting for approximately 1/3 of the overall length of head 1 proximate scoop 3 may form a severe angle with respect to the rest of the pocket side of head 1. Thus, in certain models, the portion of lower rail 2 proximate scoop 3 has a first angle Θ relative to the remainder of lower rail 2, which first angle may range between 32 and 45 degrees.

[0008] FIG. 2 depicts a prior art lacrosse head showing the first angle Θ of 38.40 degrees between the angled portion of lower rail 2 and the remainder (convex in sonic models) of lower rail 2. The apex of the angled portion of lower rail 2 adjacent scoop 3 is known as the shoulder 7. Shoulder 7 may have varying heights (as measured from the bottom of base rail 2) relative to the highest portion of stop member 11, i.e., shoulder 7 may be below, level with or above the height of stop member 11. On the ball receiving side of head 1, an upper sidewall rail 8 can form the same shape as lower rail 2 when viewed from above, i.e. a roughly inverted "bulb"-shape having as its base scoop 3 and having its sidewalls joining opposite scoop 3 at throat 4 and stop member 11. Viewed from the side, upper rail 8 forms a shallow concave shape with respect to the ball receiving side of head 1 to further define pocket 6, where the ball primarily resides when in control by the player during game play.

[0009] When lining up for a draw, two opposing players will face off with portions of the bottom edges of the lower rails 2 of their respective lacrosse stick heads touching. A referee will place the lacrosse ball between the two touching heads 1, and the ball will tend to settle near the transition point of lower rail 2, indicated by reference character 9 in FIGS. 1-2, where it is cushioned by the nylon strings (not shown) strung through stringing holes 5. Stringing holes 5 may be positioned approximately 3 mm from the bottom edges of lower rails 2 (see reference character D).

[0010] A major disadvantage of the conventional women's lacrosse head is that its shape and string hole positioning are not conducive to controlling the ball during the draw. In prior women's heads, the combination of string bole placement and positioning relative to lower rails 2, and the corresponding stringing patterns, fails to create a satisfactory area of lacrosse head material free from stringing that can "grip" a lacrosse ball where it most frequently sits during a draw play. Prior configurations also make it difficult for a player to influence the direction of the ball during a draw. In addition, the relatively uniform height of lower rail 2 from throat 4 to shoulder 7 in many prior lacrosse head models, as seen in FIGS. 1-2, makes lower rail 2 prone to increased flexing and strength vulnerability at shoulder 7 and at the transition point of lower rail 2 from convex to concave, as indicated by reference character 9 in FIG. 1.

[0011] What is needed is a women's lacrosse head specifically designed for use by the player chosen to take the draw for her team, which provides increased control over the ball when positioned at the back of the lacrosse head to begin a draw play. In addition, such a lacrosse head would beneficially have increased strength at points of potential weakness of the lacrosse head to further exert control over the ball

during a draw and regular play. Finally, such a lacrosse head would beneficially provide a pocket suitable for catching and maintaining control over a ball during normal game play, including when the draw player attempts to possess the ball herself after an initial draw move.

SUMMARY OF THE INVENTION

[0012] Accordingly, it is an object of the invention to provide an improved lacrosse head specifically designed for draw plays in women's lacrosse games to improve the player's control of the ball when positioned for a draw play.

[0013] In addition, it is an object of the present invention to provide such an improved lacrosse head having, a reinforced lower rail to add stiffness to the lowest point of the lower rail for durability during and after the draw.

[0014] In accordance with the foregoing objects, the present invention is a drawn head for attachment to a women's lacrosse handle. The head has a protrusion feature on its back edge proximate the widest portion of the head and a stringing configuration to provide increased ball control when the ball is placed against the back of the head for the game-starting draw. The head is additionally designed to allow the back of the head to seat inside the frame of the head of an opposing player's stick. For a more complete understanding of the invention, and its objects and advantages, refer to the remaining specification and to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] Other objects, features, and advantages of the present invention will become more apparent from the following detailed description of the preferred embodiment and certain modifications thereof, in which:

[0016] FIG. 1 illustrates a side view of a prior art women's lacrosse head.

[0017] FIG. 2 illustrates a side view of a prior art women's lacrosse head depicting the angle between two portions of lower rail 2.

[0018] FIG. 3 illustrates a side view of the improved women's draw head according to the present invention.

[0019] FIG. 4 illustrates a cutaway side view of the improved women's draw head according to the present invention taken along the lines 2B in FIG. 5.

[0020] FIG. 5 illustrates a top view of the improved women's draw head according to the present invention.

[0021] FIG. 6 illustrates a side view of the improved women's draw head according to the present invention, where a representative lacrosse ball is shown as positioned for a draw play.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0022] With collective reference to FIGS. 3-5, an improved women's lacrosse stick head 100 according to the present invention is shown that is optimized for draw plays. As seen in

[0023] FIGS. 3-4, the sidewall profile of lacrosse stick head 100 runs left-to-right from stop member 11 to scoop 30, and bottom-to-top from a bottom edge on the back surface or pocket side of the head 100 to a top edge on the front surface. The bottom edge of the "draw" head 100 is defined by lower rail 20. The portion of lower rail 20 proximate throat 40, accounting for approximately $\frac{2}{3}$ of the overall length of head 100 may be roughly flat or partially convex with respect to the

pocket side of head 100. The portion of lower rail 20 proximate scoop 30, accounting for approximately $\frac{1}{3}$ of the overall length of head 100, preferably forms a severe angle with respect to the remaining pocket side of head 100, having an apex at shoulder 70. For purposes of clarity, the lacrosse head 100 according to the instant invention is oriented in the same way as the prior art heads of FIGS. 1-2 such that the back or pocket side of head 100 is that portion facing the bottom of the page as viewed. The "back" or pocket side of the head is used for ball placement during a draw play, while the "front" or all receiving side of the head, facing the top of the page as viewed, accepts and retains the ball during regular game play. The transition point between the flat/convex and angled portions of lower rail 20 is denoted by reference character 90. The angle of transition β between flat/convex and concave portions of lower rail 20 may be between 37-45 degrees.

[0024] The ball receiving side of head 100 is defined by upper sidewall rail 80, which may form a shallow concave-upward shape. Lower rail 20 can have a flat or convex-downward portion with openings 22 between lower 20 and upper 80 rails. According to the present disclosure, upper rail 80 and lower rail 20 extend to a transition area before they converge to form an angled sidewall rail 21 that extends along approximately $\frac{1}{3}$ of head 100. Rail 21 may be a single unitary section as depicted or alternatively rail 21 may constitute multiple rails leading to scoop 3. Prior to convergence, the upper rail 80 and lower rail 20 are preferably separated by openings 22 between lower 20 and upper 80 rails, the openings 22 being interrupted by one Or more cross-struts 53 that may be angled as shown. The configuration of rails 20, 21, 80, openings 22 and struts 53 of head 100 is preferably formed by injection molding as is well known in the art. Alternatively, a head with rails 20, 21, 80 and struts 53 may be formed from a solid piece of material with the openings 22 between lower 20 and upper 80 rails created by die-cutting, 3D printing or a like process thereafter. The material for head 100 may be nylon or a nylon blend or any elastomer or other polymer, polycarbonate, silicone, or other material having sufficient strength to apply force to a conventional lacrosse ball. The shape and width W of rail 21 formed by the combination of lower rail 20 and upper rail 80 provides additional support to transition point 90, which can be a point of weakness in women's lacrosse heads such as those shown in FIGS. 1-2.

[0025] In addition, and as will be seen, the shape and width W of rail 21 formed by the combination of lower rail 20 and upper rail 80, particularly at a protruding section of built-up material and wider width defining a transition area 91, which advantageously provides the player with a better grip on the ball during the draw. This advantage is due in part to the novel location of stringing holes 50 on rail 21 relative to other stringing holes positioned along lower rail 20. Specifically, in forming the pocket by stringing from the last stringing hole on lower rail 20 to the first stringing hole on rail protrusion 91 projects outwardly/downwardly away from the pocket, thereby creating additional surface area of lacrosse head material to interact with the ball during the draw. By comparison, prior art heads do not have strategically designed surface area where needed and typically contain one or more interfering stringing holes where the ball is positioned in a player's head for the draw, which results in stringing material, rather than head frame material, interacting with a ball during the draw, substantially reducing ball control.

[0026] Protrusion 91 also adds additional structural support to transition point 90, a commonly understood weak spot of

heads such as shown in FIGS. 1-2. With further reference to FIGS. 3 and 4, protrusion 91 is positioned at transition point 90 as an extension of angled sidewall rail 21. The bottom edge of protrusion 91 is substantially parallel to the main axis of rail 21 and projects downward/outward toward the pocket side of head 100. In one embodiment, protrusion 91 does not extend below the plane of the relatively flat bottom edge of lower rail 20 or extend up the length of angled rail 21 so that it is directly in line with any stringing holes 50.

[0027] Stringing holes 50 may be disposed in angled rail 21 immediately adjacent to, but not on, that portion of rail 21 containing protrusion 91. Additional stringing holes may be disposed in lower rail 20 along the flat or convex lower rail 20 proximate throat 40, as best shown in FIGS. 3 and 4. Importantly, no stringing holes are disposed in the vicinity of transition point 90 occupied by protrusion 91, which defines the interior of the concave portion of the pocket side of head 100 where the ball is positioned during a draw. Stringing holes 50 disposed on angled rail 21 may be positioned approximately midway along the width W of rail 21, or approximately 7.5 mm away from the lower edge of rail 21, although this distance may be anywhere from 3-7.5 mm and is most preferably at least 7 mm. In a preferred embodiment, the distance between the stringing holes disposed on rail 21 and the bottom edge of rail 21 is the maximum allowable according to applicable equipment rules.

[0028] Stringing holes 50 on both lower rail 20 and rail 21 accept strings (not shown) extending between the two sides of head 100 and generally perpendicular to the axis between throat 40 and scoop 30. Since the women's rules for lacrosse severely restrict the depth of the pocket extending from lower rail 20 (i.e., a portion of the ball resting in the pocket must be visible above the sidewalls when viewed from the side for a pocket to be legal under the rules), the location of stringing holes 50 largely defines the pocket of head 100. Thus, in the inventive head 100 disclosed herein, the location of stringing holes 50 and the configuration of rails 20, 21, 80, wherein no stringing hole is less than 7 mm away from the lower edge of angled rail 21, facilitate a desirable distance between the bottom of the pocket and the bottom edge of rail 21 and protrusion 91, defining the interior of the concave portion of the bottom of head 100 where the ball will be positioned during a draw.

[0029] The increased surface area between the bottom edge of angled rail 21 provided by the increased width W of rail 21, the placement of stringing holes 50 and protrusion 91 advantageously provides the player with a better grip on and control of the ball during the draw. As described with reference to the prior art, during the draw play two players from opposing teams place their lacrosse stick heads 100 back-to-back (or pocket side to pocket side), raised off of the ground, with the ball positioned there between. By rule, the official positions the ball in the upper third of the head 100 at approximately the widest part of head 100 as viewed from above. FIG. 6 illustrates this configuration, with the ball shown in dotted line as it would sit against the back of head 100 between the lateral edges of angled rail 21. As can be seen, the ball is held in place by the bottom of the pocket, which corresponds to the location of stringing holes 50. The width of angled rail 21 proximate the scoop 30 (or the width of multiple rails comprising angled rail 21) allows the stringing holes 50 to be recessed a greater distance from the bottom edge of the rail 21 than in prior art women's lacrosse heads. Further, the addition of protrusion 91 moves the bottom edge of rail 21 proximate

transition point 90 further away from the back of the pocket. Thus, the locations of stringing holes 50, in conjunction with the increased width of rail 21 and the presence of protrusion 91, form a deeper recess compared with the prior art heads to increase the player's control over the ball during the draw play.

[0030] According to the instant disclosure, the shape, dimensions and width of protrusion 91 may be varied without departing from the spirit of the invention, as a matter of player or design choice. The increased overall width of rail 21, as well as the locally increased width of rail 21 at protrusion 91, also serve to increase the strength of transition point 90. This increased strength of head 100 at a common failure point of prior art heads 1 gives the player greater control over the motion of the ball during draw after the draw play.

[0031] An additional feature of the disclosure is shown with reference to FIG. 5. As shown, the bottom edge of rail 21 adjacent scoop 30 may be angled slightly inwards towards the pocket. As such, at the point where rail 21 transitions into scoop 30, the interior measurement A between lateral sides of the bottom edges of rail 21 is less than the interior measurement B between lateral sides of the top edges of rail 21. This sidewall configuration enables the bottom edge of rail 21 to seat inside the frame of many prior art heads when the backs of head 100 and a prior art head are pressed against each other, as they would be prior to the draw. This "tucking in" of the lower edge of rail 21 and scoop 30, combined with the extension of the bottom edge of rail 21, creates an advantage in terms of gaining contact with a ball during a draw and wresting it away from an opponent. Referring still to FIG. 5, the interior measurement A between lateral sides of the lower edge of rail 21, and/or the difference between the interior measurements A, B between lateral sides of lower and upper edges of rail 21, may be determined according to design and/or player preference, or dictated by the pertinent equipment rules. In a preferred embodiment, the interior measurement A is selected to be the minimum interior measurement allowed by equipment rules for this portion of head 100 between shoulders 70, enabling the bottom edge of unitary rail 21 to sit inside the outer edge of an opponent's head.

[0032] In one embodiment, head 100 further comprises reinforcing material on lower rail 20 at transition area 90. Due to the stresses of the game, transition area 90 represents a weakness and potential point of excessive flex and/or deformation for lacrosse stick heads, all of which are undesirable to players. In a preferred embodiment, as depicted in FIGS. 3, 5 and 6, the area of lower rail 20 proximate transition area 90 may include a "C-channel" configuration of reinforcing material to provide maximum stiffness at this lowest point of the bottom of lower rail 20 for increased control during the draw and overall durability during all aspects of game play. The material used to reinforce transition area 90 may be the same material used to form the remainder of lower rail 20, and may be formed integrally with lower rail 20 or added to lower rail 20 after formation of same.

[0033] Having now fully set forth the preferred embodiments and certain modifications of the concept underlying the present invention, various other embodiments as well as certain variations and modifications of the embodiments herein shown and described will obviously occur to those skilled in the art upon becoming familiar with said underlying concept. It is to be understood, therefore, that the invention may be practiced otherwise than as specifically set forth in the appended claims.

I claim:

- 1. A lacrosse stick head, comprising:
at least one laterally extending sidewall that connects to a stop member at a first end and to a transverse scoop element at a second end, said sidewall having a bottom edge defining a back surface of said head and a top edge defining a front surface of said head;
said sidewall defining a severely angled portion adjacent said scoop, said angled portion having a width W between said top edge and said bottom edge;
a plurality of stringing holes formed through said sidewall including said angled portion to an interior surface of said head;
wherein said stringing holes formed through said angled portion are spaced from said bottom edge by a distance of between 5 mm and 8 mm.
- 2. The lacrosse stick head according to claim 1, wherein said at least one laterally extending sidewall further comprises a top rail and a bottom rail connected to said stop member and converging to a single angled rail connected to said transverse scoop element.
- 3. The lacrosse stick head according to claim 2, wherein said top rail and bottom rail comprise approximately two-thirds a length of said siderail and said angled rail comprises approximately one-third a length of said siderail.
- 4. The lacrosse stick head according to claim 2, wherein said top rail and bottom rail are separated by one or more openings prior to convergence with said single angled rail.
- 5. The lacrosse stick head according to claim 4, wherein said top rail and bottom rail are separated by a plurality of openings prior to convergence with said single angled rail.
- 6. The lacrosse stick head according to claim 5, further comprising at least one strut separating said plurality of openings and spanning said top rail and bottom rail.
- 7. The lacrosse stick head according to claim 2, wherein said angled rail is angled within a range of from between 37-45 degrees from said bottom rail.
- 8. The lacrosse stick head according to claim 2, further comprising a transition area disposed on said angled rail adjacent said bottom rail composed of a section of protruding material.
- 9. The lacrosse stick head according to claim 8, wherein said transition area has a width greater than the width W between said top edge and said bottom edge.
- 10. The lacrosse stick head according to claim 8, wherein said at least one laterally extending sidewall comprises two laterally extending sidewalls and said transition area extends between said two laterally extending sidewalls.
- 11. The lacrosse stick head according to claim 8, wherein said stringing holes formed through said angled portion are offset on either side of said transition area.

- 12. A lacrosse stick head, comprising:
at least one laterally extending sidewall that connects to a stop member at a first end and to a transverse scoop element at a second end, said sidewall having a bottom edge defining a back surface of said head and a top edge defining a front surface of said head;
said sidewall defining a severely angled portion adjacent said scoop element, said angled portion having a width between said top edge and said bottom edge;
a plurality of stringing holes formed through said sidewall including said angled portion to an interior surface of said head, wherein a gap of at least three quarters of an inch exists between at least two stringing holes along said sidewall and at least a portion of said width within said gap protrudes forwardly of the remaining width of said angled portion.
- 13. The lacrosse stick head according to claim 12, comprising two laterally extending sidewalls.
- 14. The lacrosse stick head according to claim 11, wherein a distance between said two sidewalls increases towards said scoop element.
- 15. The lacrosse stick head according to claim 14, wherein an interior measurement between said sidewalls adjacent said scoop element is greater at said top than at said corresponding bottom edge of said sidewall.
- 16. The lacrosse stick head according to claim 12, wherein said at least one laterally extending sidewall further comprises a top rail and a bottom rail connected to said stop member and converging to a single angled rail connected to said transverse scoop element.
- 17. The lacrosse stick head according to claim 16, wherein said top rail and bottom rail comprise approximately two-thirds a length of said siderail and said angled rail comprises approximately one-third a length of said siderail.
- 18. The lacrosse stick head according to claim 16, wherein said top rail and bottom rail are separated by one or more openings prior to convergence with said single angled rail.
- 19. The lacrosse stick head according to claim 17, wherein said top rail and bottom rail are separated by a plurality of openings prior to convergence with said single angled rail, and at least one strut separating said plurality of openings and spanning said top rail and bottom rail.
- 20. The lacrosse stick head according to claim 16, wherein said angled rail is angled within a range of from between 37-45 degrees from said bottom rail.
- 21. The lacrosse stick head according to claim 16, further comprising a transition area disposed on said angled rail adjacent said bottom rail composed of a section of protruding material.
- 22. The lacrosse stick head according to claim 21, wherein said transition area has a width greater than the width W between said top edge and said bottom edge.

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