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(54) HOCKEY STICK SHAFT

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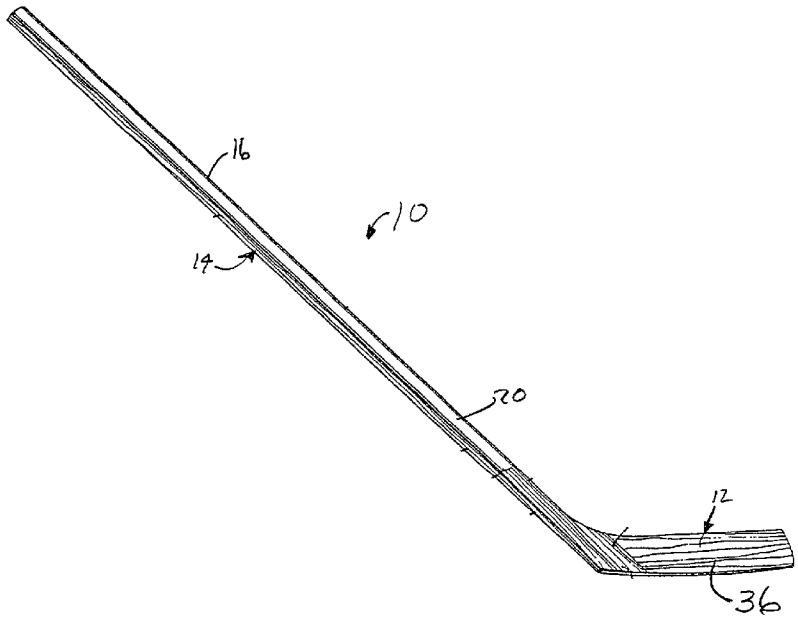
(57) **ABSTRACT**

A hockey stick handle shaft comprising a substantially rectangular cross-sectional core member. The substantially rectangular cross-sectional core member includes first and second major surfaces, with each major surface positioned opposite one another. The core member further includes a first member adhered to the first major surface and a second member adhered to the opposite second major surface, the first and second members increasing the structural integrity of the core member.



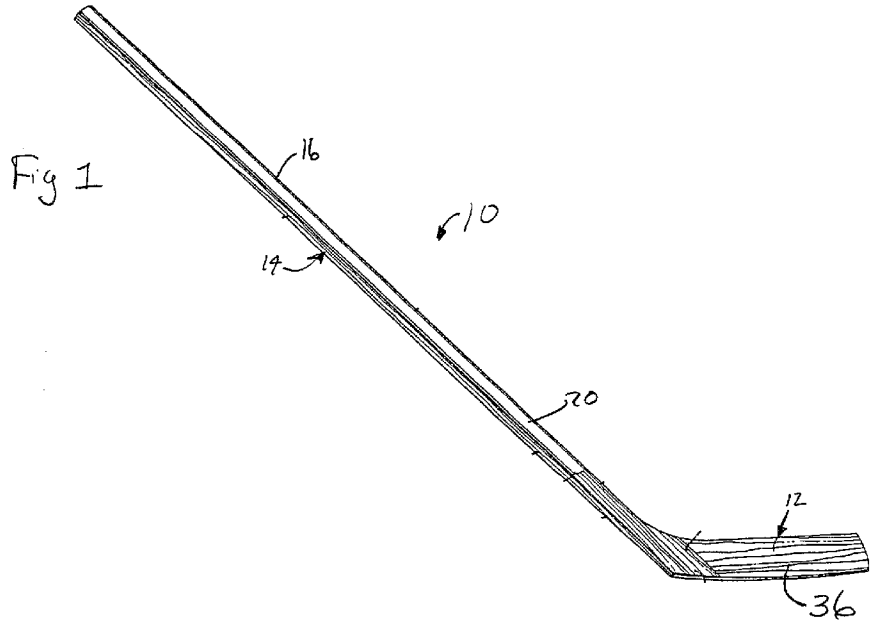


Fig 1

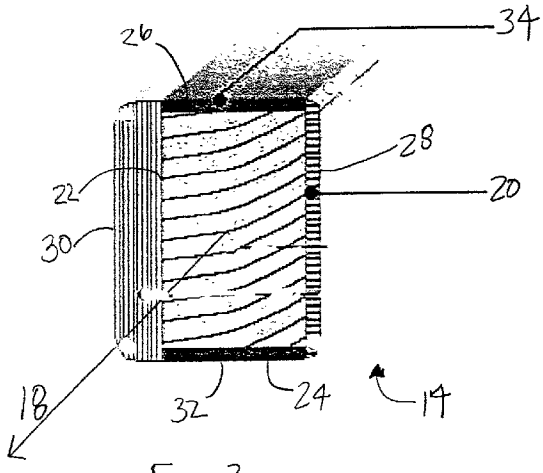


Fig 2

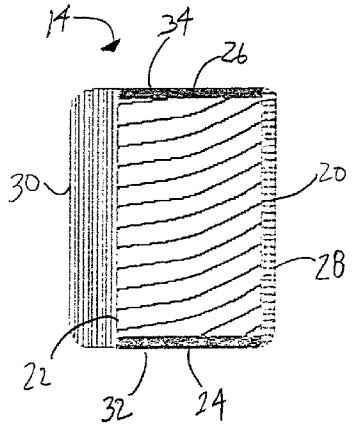


Fig 3

HOCKEY STICK SHAFT

CROSS-REFERENCE TO RELATED APPLICATION(S)

[0001] Applicant claims the priority date of U.S. Provisional Application No. 60/243,610, filed Oct. 26, 2000.

BACKGROUND OF THE INVENTION

[0002] The present invention relates to a hockey stick. In particular, the present invention relates to a handle shaft of the hockey stick.

[0003] A hockey stick includes an elongated handle shaft with a blade attached thereto. The elongated handle shaft typically has a rectangular cross-section along a central longitudinal axis, with the blade attached at one end protruding substantially parallel to the wide sides of the rectangular cross-section of the elongated hockey shaft.

[0004] In use, when a player strikes a puck with the blade of the hockey stick, the handle shaft undergoes a variety of different stresses. There are torsional stresses resulting from the torquing of the blade upon contacting the puck that tends to twist the handle shaft. There are also shearing stresses arising from the blade striking the ground or ice. Due to either of these forces or a combination of them both, it is typical for the shaft of the hockey stick to break sometimes prematurely.

[0005] Shaft destruction is problematic in both professional and amateur sports. When a the handle shaft breaks during a game, a player is left without a means for guiding or deflecting the puck either offensively or defensively, resulting in the player becoming less effective. This hinders the ability of the whole team, allowing the opponent a better chance of scoring.

[0006] Additionally, replacement of broken or damaged hockey sticks may become quite expensive. This is especially a factor in an amateur situation, where it is typical for either the player or the player's parent to purchase equipment for the player to play on a hockey team. These players need a dependable, high strength and durable hockey stick which can be used for an extended period of time.

[0007] High strength durability are not the only factors to be considered, however. There are examples in the prior which teach the manufacturing of shafts from high strength metals, composite materials, all hardwood material or combinations of all three. Shafts manufactured from metals and composite materials may have high strength and durability, however, these shafts do not have the same type of "feel" of a natural wood hockey shaft.

[0008] Shafts made from wood and reinforced with composite materials include the BAUER® 3050 (solid aspen wood core reinforced with fiberglass), and the KOHO® 2285 (aspen wood core reinforced with fiberglass and graphite). While these sticks are primarily made of wood, the construction of the shaft with the addition of the fiberglass and/or graphite diminishes the overall wood character of the shaft. In essence, the undesirable traits of the of the fiberglass and graphite overpower the desirable traits of the wood. What is missing is the resiliency and natural flexibility of an all-wood shaft. Therefore, what is needed is a shaft with improved strength and durability characteristics, while retaining the natural feel of a wooden shaft.

BRIEF SUMMARY OF THE INVENTION

[0009] The present invention includes a handle shaft of a hockey stick. The handle shaft includes a wooden core member having a substantially rectangular cross-section along a central longitudinal axis. The rectangular core member includes first and second major sides, and third and fourth minor sides. The first major side includes a fiber-glass veneer adhered thereon, while the second major side includes an aircraft veneer adhered thereon. The third and fourth minor sides include wooden veneer strips adhered thereon. Each veneer member improves the structural integrity of the core member.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] **FIG. 1** is a perspective view of a hockey stick of the present invention.

[0011] **FIG. 2** is a perspective view of a handle shaft of the hockey stick of the present invention.

[0012] **FIG. 3** is a cross-sectional view of the handle shaft of the hockey stick of the present invention taken along line A-A.

DETAILED DESCRIPTION

[0013] A hockey stick of the present invention is indicated generally at **10** in **FIG. 1**. The hockey stick **10** is comprised of two basic components. A blade component **12** in which to contact a puck (not shown) or similar object during play, and an elongated handle shaft component **14** for a player to maneuver the blade **12**.

[0014] The handle shaft component **14** of the present invention comprises a core member **16** having a substantially rectangular cross-section along a central longitudinal axis **18**, as best illustrated in **FIG. 2**. Preferably, the core member **16** is manufactured from a hardwood such as Aspen, Poplar, or an equivalent thereof.

[0015] Referring to **FIG. 3**, the substantially rectangular core member **16** includes four sides **20**, **22**, **24**, **26** with two major surfaces **20**, **22** and two minor surfaces **24**, **26**. The two major surfaces **20**, **22** are defined by the parallel opposing sides of the rectangular core member having the greater width dimensions and run the entire length of the core member **16**. The two minor surfaces **24**, **26** are defined by the parallel opposing sides of the core member having smaller width dimensions and also run the entire length of the core member **16**. It should be noted, however, that it is within the scope of this invention to have a square core member **16**. In the alternative embodiment including a square core member **16**, the first major surface is defined as the lead side of the core member **16** which faces a puck during play as will be discussed further, while the second major surface **22** directly opposes the first major surface **20**.

[0016] Attached to the first major surface **20** of the elongated core member **16** is a first veneer member **28**. Preferably, the first veneer member **28** is constructed of a **2** carbon fiber-glass material, however any material with similar characteristics is within the scope of this invention. Attached to the opposing second major surface **22** is a second veneer

member **30**. Preferably, the second veneer member is constructed of a 10-ply aircraft veneer member. Those skilled in the art of hockey stick manufacture will appreciate that aircraft veneer may be constructed from a variety of hardwoods. The selected aircraft veneer of the present invention is preferably constructed from white birch wood. Both the first fiber-glass veneer member **28** and the second aircraft veneer member **30** are preferably attached to the core member **16** by way of adhesion such as a suitable adhesive. However, other means of attachment would be within the scope of this invention.

[**0017**] As mentioned, the first major surface **20** of the hockey shaft is defined as the surface of the core member **16** which is situated to face the direction in which to strike the hockey puck with the blade **12** of the hockey stick **10**. This lead side position is therefore relative to whether the stick is a right-handed stick or a left-handed stick. In each case, the blade **12** is attached to the shaft **14** such that the blade **12** protrudes away from the shaft **14**, the face **36** of the blade **12** facing the same direction as the first major surface **20** of the core member **16**, as illustrated in **FIG. 1**.

[**0018**] When striking a puck with increased force, the core member **16** is subjected to a variety of shear, compressive, and tensile stresses. The contact between the blade **12** and either the puck or the ice tends to bend or deform the shape of the handle shaft **14** from an original position. Being that the first major surface **20** faces the direction of the puck, the bending of the shaft **14** places a tensile stress on the first veneer member **28**. At the same time, the opposing second veneer member **30** is placed under a compressive stress. The elastic and durable qualities of the fiber-glass veneer **28** attached to the lead surface **20** of the core member **16** allow the shaft **14** of the hockey stick **10** to bend within tolerable standards without destruction of the core member **16**. The same elastic and durable qualities of fiberglass veneer **28** tend to bring the shaft **14** of the hockey stick **10** back to the original position faster than if both veneers **28**, **30** were constructed of aircraft veneer.

[**0019**] Attached to the third minor surface **24** of the core member **16** is a third veneer member **32**. Additionally, attached to the opposing fourth minor surface **26** of the core member **16** is a fourth veneer member **34**. Both the third and fourth veneer members, **32** and **34** respectively, are preferably constructed of birch wood, and more particularly yellow birch wood. However, any material having equivalent properties of birch wood would be within the scope of this invention. The third and fourth veneer members **32** and **34** aid in supporting the structural integrity of the core member **16** from torsional strain. With the blade **12** of the hockey stick **10** protruding away from the shaft **14**, a torquing force results whenever the blade **12** contacts the puck, ice, or any other object. The torquing force tends to twist the core member **16**, and if the force is great enough, destruction of the core member **16** results. With the addition of the third and fourth veneer members **32** and **34**, the amount of twisting upon the core member **16** is reduced, thus strengthening the core member **16**.

[**0020**] In the preferred embodiment, the average weight of the hockey stick **10** is approximately 610 grams, the width of the stick **10** being approximately 0.790 inches (the width of the core member **16** in addition to the first and second veneer members **28** and **30** respectively), the height of the stick **10** being approximately 1.165 inches (the height of the core member **16** in addition to the third and fourth veneer members **32** and **34** respectively). The first veneer member has an approximate thickness of at least 0.0420 inches. The second veneer member has an approximate thickness of 0.2145 inches. The third and fourth veneer members **32** and **34** have an approximate thickness of about 0.0620 inches. The hockey stick **10** has a hockey length of approximately 57.5 inches, a shaved handle length of approximately 6 inches, and a taper length of approximately 11.5 inches.

[**0021**] Although the present invention has been described with reference to preferred embodiments, workers skilled in the art will recognize that changes may be made in form and detail without departing from the spirit and scope of the invention.

1. A hockey stick handle shaft comprising:

a core member having a substantially rectangular cross-section along a central longitudinal axis, the core member including first and second major surfaces;

a first member adhered to the first major surface of the core member;

a second member adhered to the second major surface of the core member; and

the first and second members providing structural integrity to the core member.

2. The shaft of claim 1 wherein the core member further comprises third and fourth minor surfaces, the third and fourth minor surfaces positioned substantially orthogonal to each first and second major surfaces.

3. The shaft of claim 2 and further comprising:

a third member adhered to the third minor surface;

a fourth member adhered to the fourth minor surface; and

the third and fourth members providing structural integrity to the core member.

4. The shaft of claim 1 wherein the core member is constructed of wood.

5. The shaft of claim 4 wherein the core member is constructed of an aspen-type wood.

6. The shaft of claim 1 wherein the first member is a fiber-glass veneer.

7. The shaft of claim 6 wherein the thickness of the fiber-glass veneer is at least about 0.042 inches.

8. The shaft of claim 1 wherein the second member is a wooden veneer.

9. The shaft of claim 8 wherein the second member is a white birch veneer.

10. The shaft of claim 8 wherein the wooden veneer is at least about 0.24 inches thick.

11. The shaft of claim 3 wherein the third member is wood veneer.

12. The shaft of claim 3 wherein the fourth member is wood veneer.

13. The shaft of claim 11 wherein the third member is constructed of yellow birch wood veneer.

14. The shaft of claim 12 wherein the fourth member is constructed of yellow birch wood veneer.

15. The shaft of claim 1 wherein the first major surface is a lead surface.

16. A handle shaft of a hockey stick having a substantially rectangular cross-section core member along a central lon-

gitudinal axis, the core member having a member adhered to each surface, each member providing support to the structural integrity of the core member, the shaft comprising:

a core member having a substantially rectangular cross-section along a central longitudinal axis, the core member including:

a first major surface;

a second major surface;

a third minor surface; and

a fourth minor surface;

a first member adhered to the first major surface;

a second member adhered to the second major surface;

a third member adhered to the third minor surface; and

a fourth member adhered to the fourth minor surface.

17. The shaft of claim 15 wherein the first member includes a fiber-glass veneer.

18. The shaft of claim 15 wherein the second member includes a wooden veneer.

19. The shaft of claim 17 wherein the second member includes an aircraft veneer.

20. The shaft of claim 18 wherein the aircraft veneer includes a white birch wood.

21. The shaft of claim 15 wherein the third and fourth members include a wood veneer.

22. The shaft of claim 20 wherein the third and fourth members include yellow birch wood veneer.

23. The shaft of claim 15 wherein the first member has a thickness of at least about 0.042 inches.

24. The shaft of claim 15 wherein the second member has a thickness of at least about 0.214 inches.

25. The shaft of claim 15 wherein the third and fourth members have a thickness of at least about 0.062 inches.

26. The shaft of claim 15 wherein the core member includes a wood material.

27. The shaft of claim 25 wherein the core member includes an aspen wood.

28. The shaft of claim 1 wherein the first major surface is a lead surface.

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