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(56) Documents Cited:
GB 1093528 A **GB 0231294 A**
US 6033328 A

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UK CL (Edition X) **A6D**
INT CL **A63B**
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(54) Abstract Title: **Hurley stick**

(57) A hurley stick comprises a shaft 3 with first and second outer layers 8,9 extending from an upper handle end to a lower head end 5, and an insert 10 of material of greater rigidity than that of the outer layers, arranged to extend longitudinally between at least a portion of the outer layers. The layers 8,9,10 may be made from wood. Alternatively the insert 10 may be made from a plastics material or a combination of wood and plastics.

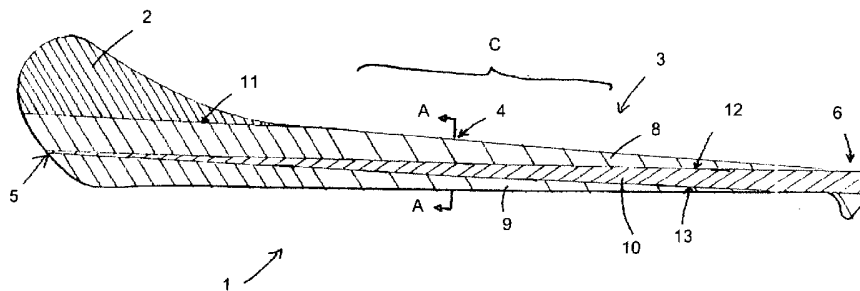
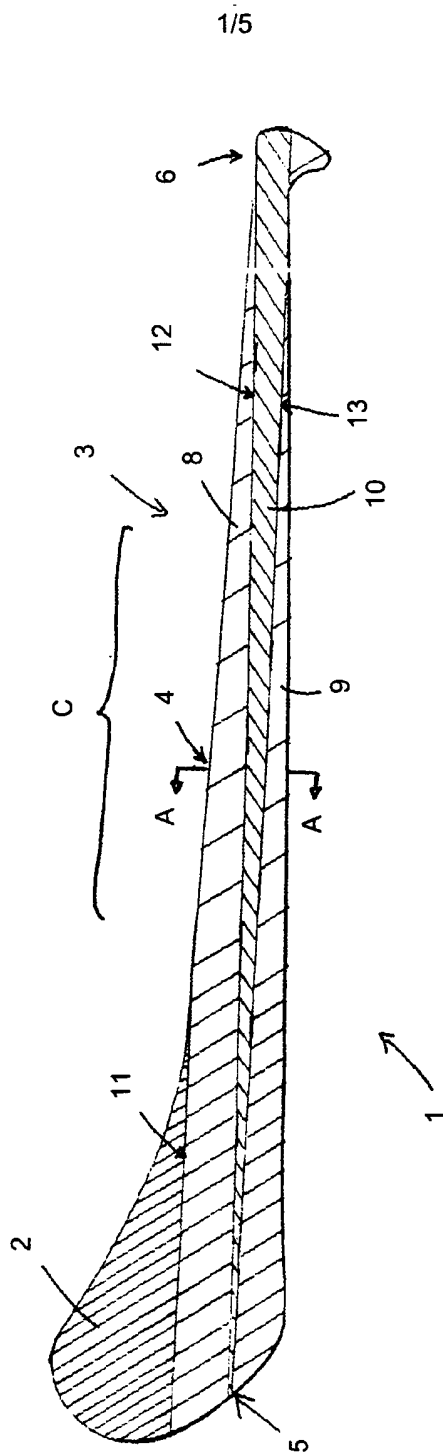


Fig. 1

04.10.06



04 12 08

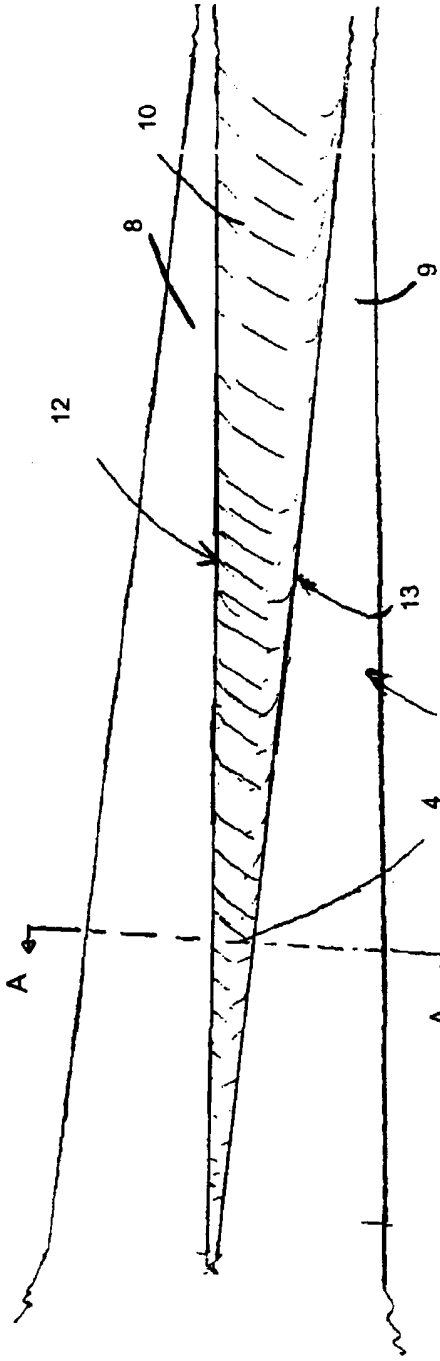


Fig. 2a

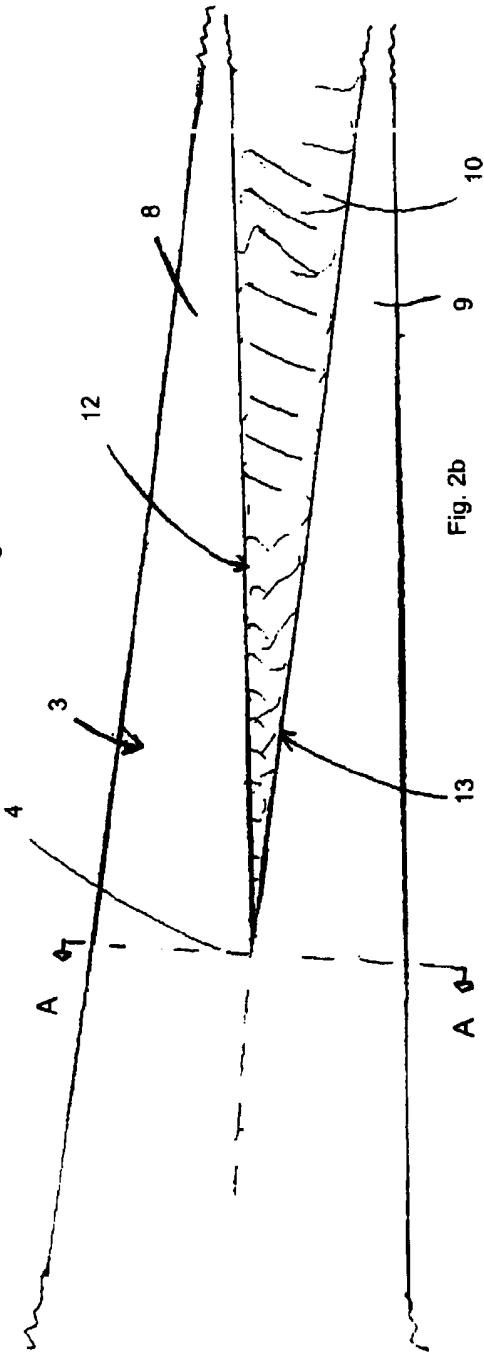


Fig. 2b

04 12 05

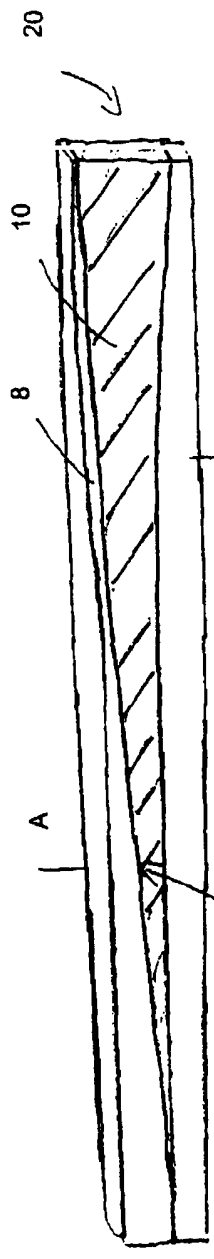


Fig. 3a

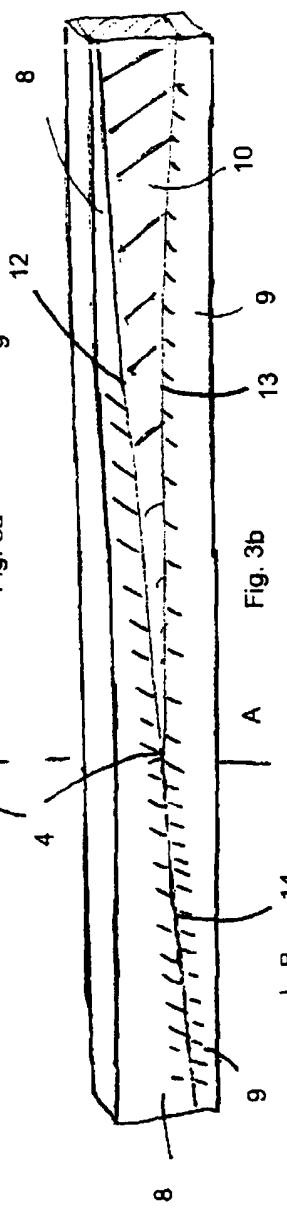


Fig. 3b

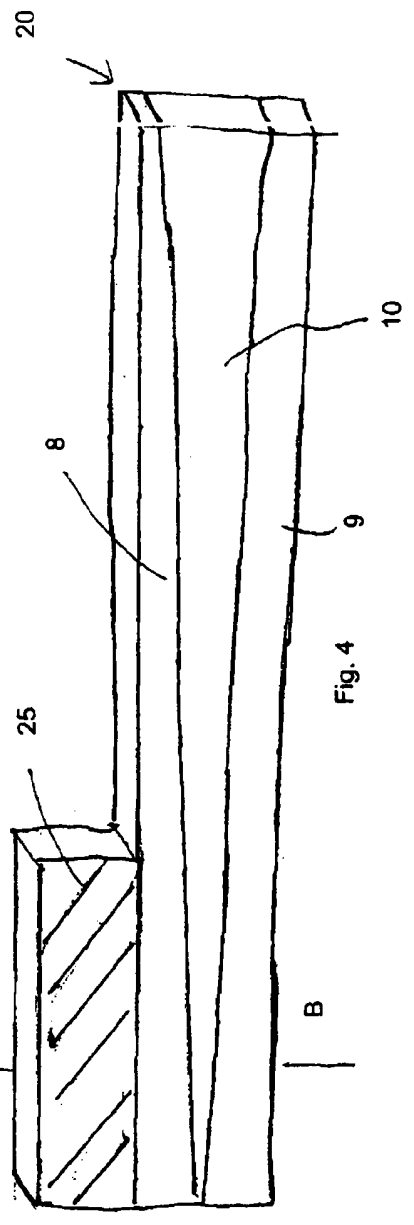


Fig. 4

4 13 05

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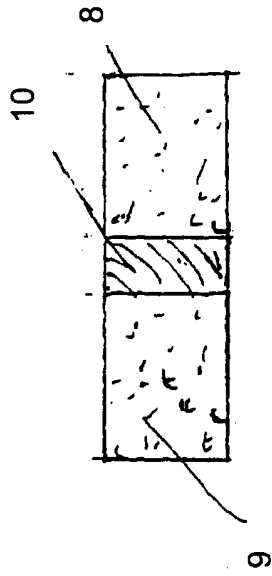
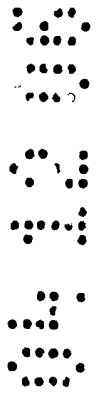
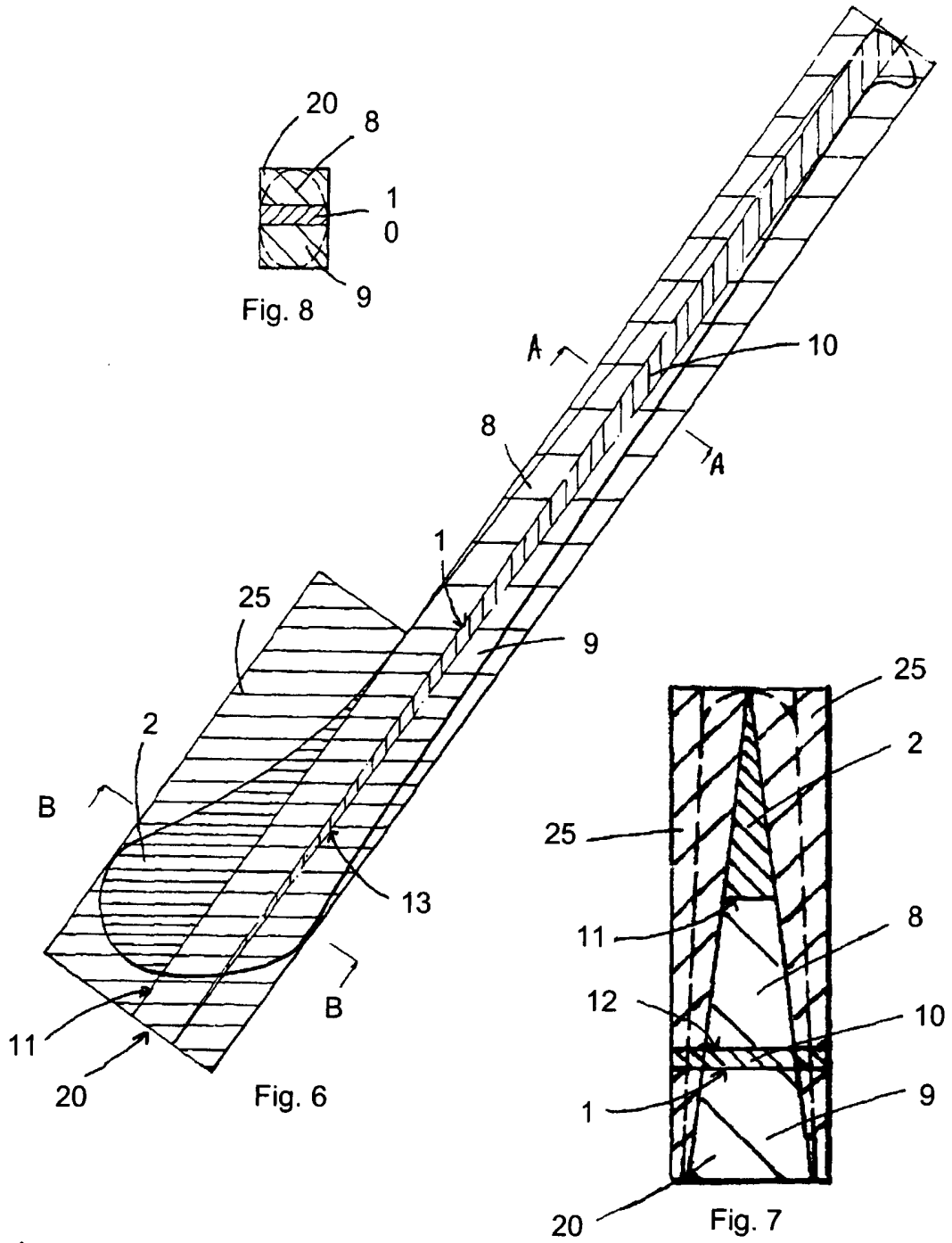


Fig. 5



Title

A hurley stick

Field of the Invention

5 The present invention relates to hurley sticks, and a method for manufacturing hurley sticks.

Background Of The Invention

10 The game of hurling is over 100 years old, and during that time Ash wood has been used in the making of hurley sticks. Over the past 25 years the availability of suitable ash wood supplies has been dwindling and this has created a problem for manufacturers and the end user alike.

15 The game of hurling could be described as an impact sport, where the "Clash of the Ash" is a feature of the game, but this clash of hurleys means the hurley should be made from very specific material if it is to withstand the stresses generated on impact.

20 The hurley stick should ideally be manufactured from young fast growth trees that have matured in a relatively high humidity level. This influences the resilience or flexibility to the wood, the essential factor for impact resistance. However in recent times 70-80% of the material requirements have had to be sourced from countries with cold climates as a result the raw materials are often even less suitable for the manufacture of hurley sticks.

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 As a result there now exists a need to find a more consistent method of manufacture of hurley sticks capable of withstanding the impacts experienced during play.

There are therefore a number of problems with the conventional hurley sticks and the methods of manufacturing of hurley sticks that need to be addressed.

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Summary Of The Invention

These needs and others are addressed by a hurley stick in accordance with the teachings of the invention having a head portion and a shaft portion, wherein the shaft portion comprises first and second outer layers extending
10 longitudinally from an upper handle end to a lower head end, and having an insert of material of greater rigidity than that of the outer layers, the insert extending longitudinally between at least a portion of said outer layers.

The invention therefore provides a hurley stick as claimed in claim 1.
15 Advantageous embodiments are provided in the dependent claims thereto.

The invention also provides a method of manufacturing a hurley stick as claimed in claim 25.

20 Brief Description Of The Drawings

The present invention will now be described with reference to the accompanying drawings in which:

Fig. 1 is a plan view from the side of a hurley stick according to the
25 invention;

Figs. 2(a) and 2(b) are detailed views from the side of two alternative arrangements of handle /shaft portions, indicated as the portion C, of the hurley stick of Fig. 1 ;

30

Figs. 3(a) and 3(b) are plan views from the side of wood blocks used to form the handle portion of Figs. 2(a) and 2(b);

5 Figs. 4 is a plan view from the side of wood blocks used to form the head portion and the handle portion of Figs. 2(a);

Fig. 5 is a cross-sectional view on the line A-A of Figs. 2(a) and 3(a);

10 Fig. 6 is a plan view from the side of the arrangement of wood blocks used to form a hurley stick according to the invention and shows in outline thereon the form of the handle portion and the head portion;

Fig. 7 is a cross-sectional view on the line B-B of Fig. 6; and

15 Fig. 8 is a cross-sectional view of the handle portion of Fig. 6, showing in outline the cross-section of the form of the final machined handle.

Detailed Description Of The Drawings

20 Referring to the drawings, a hurley stick 1 comprises a head portion 2 and a shaft portion 3. The shaft portion 3 extends from a lower head end 5 to an upper handle end 6. The shaft 3 comprises a handle flex area 4, which is located approximately 250mm up from the head end 5. A hurley stick shaft generally varies in length from 750-900mm.

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The hurley stick 1 has a composite form made, in this case, by having the head portion 2 bonded by adhesive to the shaft portion 3 at a joint 11. The shaft portion 3 is a multi-layer structure, comprised in this exemplary embodiment of layers 8, 9 and 10. The different materials used for these layers are selected for their properties of hardness, rigidity and flexibility, and are combined as
30 required to form a hurley stick according to the invention.

In this case, the shaft portion 3 is comprised of three portions or layers of wood, namely two outer portions 8 and 9 of a flexible wood, and a central insert 10 arranged extending longitudinally between at least a portion of the outer layers 8 and 9. Figs. 2(a) and 2(b) show two alternative arrangements.

The central insert 10 is of a more rigid material, in this case of a wood that is more rigid than the outer portions or layers. In the example embodiment (Figs. 1 and 6), the central insert 10 has a wedge form which tapers from the top handle end 6 of the shaft portion towards the lower head end 5. The insert 10 is bonded to the outer layers 8 and 9 at joints 12 and 13.

In the case where the insert 10 (Fig. 2b and Fig. 3b) does not extend right down to the head end of the shaft portion the insert is bonded to the outer layers 8 and 9 adjacent thereto at joints 12 and 13 and the outer layers 8 and 9 are bonded to each other at the joint 14 below the insert.

The insert 10 and each of the outer layers extend through from one side of the shaft portion to the other and is exposed to the sides of the hurley stick.

20

The levels of flexibility and impact resistance in the shaft 3, and in particular at the handle flex area 4, may be varied as required by varying the longitudinal extent of central insert 10, and by varying the position and extent of the insert relative to the lower head end 5 of the shaft.

25

Figs. 2(a) and 2(b) show two alternative arrangements of the shaft 3. The insert 10 of Fig. 2(a) is of greater length and extends further down the shaft, in the direction of the lower head end 5, than the insert of Fig. 2(b). The flexibility of the handle of Fig. 2(a) is therefore less than that of the shaft of Fig. 2(b).

30

This allows for the maximum cross section of the flexible wood/material to be utilized where the maximum impact resistance is required.

5 The central insert 10 may be of solid wood, laminated wood or any combination of plastic fibres etc. The insert is comprised of a material having greater rigidity than the outer layers to which it is bonded.

10 The outer layers 8 and 9 are of material of suitable flexibility. The flexible outer layers may be comprised of ash or other woods such as bamboo, manu, rattan and rubber wood. They may also be comprised of a suitable combination of these materials and/or other suitable plastics.

15 While in the embodiments described the hurley stick is formed of wood, it will be appreciated that different suitable alternative materials may be substituted, or used in combination with wood material as required.

20 The hurley stick of the invention is comprised of three layers of material, as described above, of which the two outer layers are of material having greater flexibility than the central insert. The outer layers and the insert are bonded at the interfacing surfaces to form joints 12 and 13. The form, dimensions and location of the insert may be varied to produce a hurley stick having the required flexibility and impact resistance. In use, the interaction at the joints 12 and 13 of the layers making up the hurley stick shaft, is such that forces are dissipated between the layers.

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A method of manufacture of a hurley stick 1 according to the invention includes the following steps:

Manufacturing the shaft portion 3 including the steps of:

30

- providing a block comprised of a flexible wood material

- cutting the block to form the outer portions 8 and 9. The outer portions are cut to provide a recess for receiving the central insert 10 (in this case an insert of a wedge form, to be bonded between outer portions 8 and 9)
- cutting a piece of material of suitable rigidity to form the insert 10
- 5 - placing the insert 10 between the outer portions 8 and 9
- bonding with adhesive to the outer layers 8 and 9 at joints 12 and 13 and,
- in the case where the insert 10 does not extend the full length of the shaft portion the outer portions 8 and 9 are bonded together at joint 14 below the
- 10 insert 10.

This gives the composite woodblock 20, 10 from which the shaft section of the hurley is formed. The head portion 2 of the hurley is formed from a separate woodblock. The block 25 is bonded to the composite block 20 at the

15 joint 11.

- The method of manufacture of the head portion 3 includes the following steps:
- providing a block 25
 - 20 - bonding the block 25 to the lower end of the composite woodblock 20, 10 (the block 25 maybe comprised of a hardwood / softwood or other suitable material)
 - machining the block 25 and the composite woodblock 20, 10 to the finished hurley profile shown in Fig. 7 (dashed cut-lines),
 - 25 - machining the handle portion 3 to a flat beveled section as shown Fig. 7 to receive head reinforcing layers
 - bonding at an angle to the composite shaft over an area approximately 250mm from the lower end 5.

30 The remaining steps of manufacture are conventional, and are not described in detail here but include the following:

- machining the outer edges of the hurley with an oval profile to facilitate use in play.

5 While in the embodiment described the composite block 20, 10 is made up of three layers, namely the outer layers 8, 9 and the insert layer 10 and that each layer extends the width of the block from the front side through to the rear side.

10 It will be appreciated that suitable alternative arrangements may also be 5 used. For example, in an alternative arrangement, the insert may be encapsulated in the outer layers of more flexible material. While in the embodiment described the layers 8 and 9 are of the same flexible wood material, it will be appreciated that they may be of different 10 materials, these 15 materials being of greater flexibility than the material of the insert.

The method of manufacture of the head portion and shaft portion according to the invention has a number of advantages as follows: It gives a considerable saving in wood over a traditional hurley which is machined from a 20 single piece of wood with much of the wood being discarded. Also by making the head portion separately from the shaft portion, it may be made from stronger wood. The head portion may also be bonded in a cross-grain fashion similar to plywood thus giving great strength and rigidity.

25 The invention has the further advantage that it is possible to vary the flexibility and impact resistance of the hurley stick. This is particularly important for hurley sticks for adults where the impact during use is more severe.

While in the embodiment described the insert as a wedge form, other 30 suitable forms may also be used depending on the degree of flexibility required, for example an insert of a substantially rectangular form may be used. The

method of the invention provides a means for providing a hurley stick having the required levels of flexibility and impact resistance. The flexibility and impact resistance may be controlled during manufacture giving a constant quality of finished product at a competitive cost.

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The words comprises/comprising when used in this specification are to specify the presence of stated features, integers, steps or components but does not preclude the presence or addition of one or more other features, integers, steps, components or groups thereof.

10

Claims

1. A hurley stick having a head portion and a shaft portion, wherein the shaft portion comprises first and second outer layers extending longitudinally from an upper handle end to a lower head end, and having an insert of material of greater rigidity than that of the outer layers, the insert extending longitudinally between at least a portion of said outer layers.
5
2. A hurley stick as claimed in claim 1 wherein the insert comprises a wedge form.
10
3. A hurley stick as claimed in claims 1 or 2 wherein the insert tapers towards the lower head end of the shaft portion.
15
4. A hurley stick as claimed in any preceding claim wherein the first and second outer layers are bonded to the insert and/or each other to form the shaft portion.
5. A hurley stick as claimed in any preceding claim wherein the insert is comprised of a solid wood.
20
6. A hurley stick as claimed in any preceding claim wherein the insert is comprised of a laminated wood or plastics material, or a suitable combination thereof.
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7. A hurley stick as claimed in any preceding wherein the first and second outer layers are comprised of a material having the required properties of flexibility.
30
8. A hurley stick as claimed in any preceding claim wherein the first and second outer layers are comprised of a flexible wood, for

10

example ash, rubber, rattan, manu, or bamboo or a suitable combination thereof.

- 5
9. A hurley stick as claimed in any preceding claim comprising a handle flex area located between 200mm and 300mm, preferably 250mm from the lower head end of the shaft portion
10. A hurley stick as claimed in claim 9 wherein insert extends through the handle flex area.
- 10
11. A hurley stick as claimed in claim 9 wherein the insert extends upwardly from the handle flex area.
12. A hurley stick as claimed in claims 9 to 11 wherein the flexibility of the shaft is varied by varying the cross-sectional area of the insert at the handle flex area.
- 15
13. A hurley stick as claimed in any preceding claim wherein the flexibility of the shaft is varied by varying the longitudinal extent of the insert.
- 20
14. A hurley stick as claimed in claims 9 to 13 wherein the flexibility of the shaft is varied by varying the cross-sectional area of the insert at the handle flex area.
- 25
15. A hurley stick as claimed in any preceding claim wherein the impact resistance is varied by varying the longitudinal extent of the insert.
- 30
16. A hurley stick as claimed in any preceding claim wherein the head portion is manufactured separately from the shaft portion and is bonded thereto.

17. A hurley stick as claimed in any preceding claim wherein the head portion may be comprised of hardwood, softwood or other suitable material.
- 5 18. A hurley stick as claimed in claims 15 or 16 wherein the head portion is comprised of wood bonded in a cross-grain or angle fashion.
- 10 19. A hurley stick as claimed in claims 15 to 18 wherein the head portion is comprised of two outer head layers and one central head layer of wood.
- 15 20. A hurley stick as claimed in claim 19 wherein the central head layer comprises a tapered form and the outer head layers are bonded to the sides thereof with the grain of the outer head layers running substantially at an angle to the grain of the shaft portion and the central head layer.
- 20 21. A hurley stick as claimed in claims 19 or 20 wherein the outer head layers comprise reinforcing layers.
- 25 22. A hurley stick as claimed in claims 19 to 21 wherein the hurley stick comprises a lower surface and wherein the grain of the outer head layers runs parallel to the lower surface of the hurley stick at an angle of substantially 70 degrees to the grain of the shaft portion.
23. A hurley stick as claimed in claims 19 to 22 wherein the insert is sandwiched between the outer layers.
- 30 24. A hurley stick substantially as hereinbefore described with reference to the drawings.

25. A method of manufacturing a hurley stick including:

(a) manufacturing the shaft portion including the steps of:

5

(i) providing a shaft portion block of a material of suitable flexibility

(ii) cutting the block to form a recess between outer portions for receiving an insert

(iii) cutting a piece of material of rigidity greater than the rigidity of the material of the shaft portion block, to form an insert

10

(iv) placing the insert into the recess between the outer portions

(v) bonding the insert with adhesive to the outer portions

(b) manufacturing the head portion including the steps of:

15

(vi) providing a head portion block

(vii) bonding the head portion block to the lower end of the shaft portion block

(viii) machining the head portion block to the required profile

(ix) machining the shaft portion to a flat bevelled section to receive head reinforcing layers

20

(x) bonding head reinforcing layers at an angle to the composite shaft.

21. A method of manufacturing a hurley stick as hereinbefore described with reference to the drawings.

Claims

1. A hurley stick having a head portion and a shaft portion, the head portion presenting front and back hitting surfaces, wherein the shaft portion
5 comprises first and second outer layers extending longitudinally from an upper handle end to a lower head end, and having an insert of material of greater rigidity than that of the outer layers, the insert extending longitudinally between at least a portion of said outer layers, wherein the flexibility of the shaft is related to the cross-sectional area of the insert at a handle flex area, and
10 wherein the cross-sectional area of the insert is defined in a substantially rectangular form and is arranged such that at the handle flex area the short sides of the substantially rectangular form are arranged substantially parallel to the hitting surfaces of the head and the long sides thereof are arranged substantially transversely thereto.

15

2. A hurley stick as claimed in claim 1 wherein the insert comprises a wedge form.

3. A hurley as claimed in claims 1 or 2 wherein the insert tapers towards
20 the lower head end of the shaft portion

3. A hurley stick as claimed in any preceding claim wherein the first and second outer layers are bonded to the insert and/or each other to form the shaft
portion.

25

4. A hurley stick as claimed in any preceding claim wherein the insert is comprised of a solid wood.

5. A hurley stick as claimed in any preceding claim wherein the insert is
30 comprised of a laminated wood or plastics material, or a suitable combination thereof.

6. A hurley stick as claimed in any preceding wherein the first and second outer layers are comprised of a material having the required properties of flexibility.

5

7. A hurley stick as claimed in any preceding claim wherein the first and second outer layers are comprised of a flexible wood, for example ash, rubber, rattan, manu, or bamboo or a suitable combination thereof.

10 8. A hurley stick as claimed in any preceding claim wherein the handle flex area is located between 200mm and 300mm, preferably 250mm from the lower head end of the shaft portion

15 9. A hurley stick as claimed in any preceding claim wherein insert extends through the handle flex area.

10. A hurley stick as claimed in any preceding claim wherein the insert extends upwardly from the handle flex area.

20 11. A hurley stick as claimed in any preceding claim wherein the flexibility of the shaft is varied by varying the cross-sectional area of the insert at the handle flex area.

25 12. A hurley stick as claimed in any preceding claim wherein the flexibility of the shaft is varied by varying the longitudinal extent of the insert.

13. A hurley stick as claimed in any preceding claim wherein the impact resistance is varied by varying the longitudinal extent of the insert.

30 14. A hurley stick as claimed in any preceding claim wherein the head portion is manufactured separately from the shaft portion and is bonded thereto.

15. A hurley stick as claimed in any preceding claim wherein the head portion may be comprised of hardwood, softwood or other suitable material.

5 16. A hurley stick substantially as hereinbefore described with reference to the drawings.

17. A method of manufacturing a hurley stick including the steps of:

10 - manufacturing the shaft portion including the steps of:
 - providing a shaft portion block of a material of suitable flexibility
 - cutting the block to form a recess between outer portions for receiving an insert

 - cutting a piece of material of rigidity greater than the rigidity of the material of the shaft portion block, to form an insert

15 - placing the insert into the recess between the outer portions
 - bonding the insert with adhesive to the outer portions

 - manufacturing the head portion including the steps of:
 20 - providing a head portion block
 - bonding the head portion block to the lower end of the shaft portion block,
 and

 wherein the insert has a rectangular form and is arranged such that at a handle flex area the short sides of the rectangular form are parallel to a hitting surface of the head portion.

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18. A method of manufacturing a hurley stick as hereinbefore described with reference to the drawings.

Application No: GB0621304.5

Examiner: Paul Makin

Claims searched: 1-26

Date of search: 7 February 2007

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
Y	1-12,14,16-23	US 6033328 A (BELLEFLEUR) whole document
Y	1,4,5,7-11,13,15,17-23	GB 231294 A (HAZELL) see particularly line 113 page 2 - line 22 page 3
Y	1-23	GB 1093528 A (GARTLAND) whole document

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^X :

A6D

Worldwide search of patent documents classified in the following areas of the IPC

A63B

The following online and other databases have been used in the preparation of this search report

WPI, EPODOC, TXTE