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(54) Racket with improved strength and low air resistance

(57) A racket (10, 40, 50, 60, 70, 80) with improved strength and low air resistance includes a head frame (20, 41, 66, 72, 82), a connecting portion (30) extending from the head frame (20, 41, 66, 72, 82), and a handle fastened to a free end (31) of the connecting portion (30). The head frame (20, 41, 66, 72, 82) is provided with an inner circumference surface (22, 44, 56), an outer circumference surface (25) and two annular surfaces (26, 52, 62, 74, 84) connecting between the inner circumference surface (22, 44, 56) and the outer circumference surface (25). The annular surfaces (26, 52, 62, 74, 84) are provided with a plurality of concavities (27, 54, 64, 76, 86) adjacent to the inner circumference surface (22, 44, 56) such that an edge of the inner circumference surface (22, 44, 56) has a waved shape. By means of the aforesaid arrangement, the racket (10, 40, 50, 60, 70, 80) has improved strength and low air resistance and is easy to manipulate.

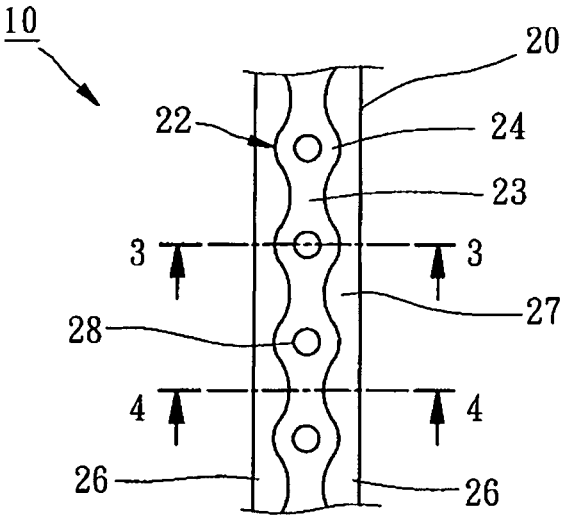

FIG. 2

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Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to sports goods and more particularly, to a racket with improved strength and low air resistance.

2. Description of the Related Art

[0002] A conventional racket, such as badminton racket, tennis racket or squash racket, includes a head frame, a connecting portion extending from the head frame, and a handle fastened to a free end of the connecting portion. The cross section of the head frame has an approximately rectangular shape. Thus the air resistance of the head frame during waving the racket is not small. Besides, the head frame is the part most likely to be broken by external force since the head frame bears the tension of the net. Therefore, it is an important topic in this technique area as how to enhance the structure strength of the head frame.

SUMMARY OF THE INVENTION

[0003] The present invention has been accomplished under the circumstances in view. It is one object of the present invention to provide a racket with improved structure strength and low air resistance.

[0004] It is another object of the present invention to provide a racket, which is pretty easy to manipulate.

[0005] It is another object of the present invention to provide a racket with a longer lifetime.

[0006] To achieve these and other objects of the present invention, the racket includes a head frame, a connecting portion extending from the head frame, and a handle fastened to a free end of the connecting portion. The head frame is provided with an inner circumference surface, an outer circumference surface and two annular surfaces connecting between the inner circumference surface and the outer circumference surface. The annular surfaces are provided with a plurality of concavities adjacent to the inner circumference surface such that an edge of the inner circumference surface has a waved shape.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007]

FIG. 1 is a perspective view of a first embodiment of the present invention.

FIG. 2 is a side view of part of the first embodiment of the present invention.

FIG. 3 is a sectional view along line 3-3 in FIG. 2.

FIG. 4 is a sectional view along line 4-4 in FIG. 2.

FIG. 5 is a side view of part of a second embodiment of the present invention.

FIG. 6 is a side view of part of a third embodiment of the present invention.

FIG. 7 is a perspective view of part of a fourth embodiment of the present invention.

FIG. 8 is a perspective view of a fifth embodiment of the present invention.

FIG. 9 is a perspective view of a sixth embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0008] Referring to FIGS. 1, a racket **10** in accordance with the first embodiment of the present invention comprises a head frame **20,** a connecting portion **30** extending from the head frame **20,** and a handle (not shown) fastened to a distal end **31** of the connecting portion **30.** The racket **10** of the first embodiment of the present invention is a badminton racket and the connecting portion **30** is a straight rod.

[0009] The features of the present invention is that the head frame **20** has an inner circumference surface **22,** an outer circumference surface **25** and two annular surfaces **26** connecting between the inner circumference surface **22** and the outer circumference surface **25.** The two annular surfaces **26** are respectively provided with a plurality of concavities **27** adjacent to the inner circumference surface **22** such that an edge of the inner circumference surface **22** has a waved shape. The concavities **27** of the two annular surfaces **26** correspond to each other in a pair manner, as shown in FIG 2, such that a neck **23** of the inner circumference surface **22** is formed between each pair of the corresponding concavities **27** and a plurality of wide heads **24** are formed between the necks **23.** The inner circumference surface **22** is a smooth annular surface with interlaced wider heads **24** and narrower necks **23** such that the inner circumference surface **22** has a calabash-like shape. FIGS. 3-4 show the cross-section of the head frame **20** respectively along the head **24** and the neck **23.** The head frame **20** is provided with a plurality of holes **28** located between the necks **23.**

[0010] Since the concavities **27** are located between the two annular surfaces **26** and the inner circumference surface **22,** the area facing the wind during waving the racket **10** is decreased, so as to diminish the air resistance to make it easy to manipulate the racket **10.** Furthermore, the structure strength of the head frame **20** is improved since the surrounding wall **29** of the head frame **20** is meandrous such that the racket **10** has an elongated lifetime.

[0011] The spirit of the present invention can be applied to similar products, such as tennis racket, squash racket, etc. The structure of the head frame has a lot of alternatives, too. Several examples are given below. A racket **40** in accordance with the second embodiment of the present invention is shown in FIG. 5. The head frame

41 of the racket **40** is provided with a plurality of holes **42** located at the necks **46** of the inner circumference surface **44.** A racket **50** in accordance with the third embodiment of the present invention is shown in FIG. 6. The concavities **54** of the two annular surfaces **52** are arranged in a staggered manner such that the inner circumference surface **56** has a continuous S-shape. A racket **60** in accordance with the fourth embodiment of the present invention is shown in FIG. 7. The concavities **64** of the two annular surfaces **62** are provided merely along several sections of the head frame **66.** Only one of the two annular surfaces **62** is provided with the concavities **64** in specific section **S.** A tennis racket **70** in accordance with the fifth embodiment of the present invention is shown in FIG. 8. The two annular surfaces **74** are provided with a plurality of concavities **76** corresponding to each other in a pair manner in specific section **S** of the head frame **72.** A squash racket **80** in accordance with the sixth embodiment of the present invention is shown in FIG. 9. The two annular surfaces **84** are provided with a plurality of concavities **86** corresponding to each other in a pair manner in specific section **S** of the head frame **82.**

[0012] Although particular embodiments of the invention have been described in detail for purposes of illustration, various modifications and enhancements may be made without departing from the spirit and scope of the invention. Accordingly, the invention is not to be limited except as by the appended claims.

Claims

1. A racket (10, 40, 50, 60, 70, 80) with improved strength and low air resistance, comprising:

   a head frame (20, 41, 66, 72, 82) provided with an inner circumference surface (22, 44, 56), an outer circumference surface (25) and two annular surfaces (26, 52, 62, 74, 84) connecting between said inner circumference surface (22, 44, 56) and said outer circumference surface (25); wherein said annular surfaces (26, 52, 62, 74, 84) are provided with a plurality of concavities (27, 54, 64, 76, 86) adjacent to said inner circumference surface (22, 44, 56) such that an edge of said inner circumference surface (22, 44, 56) has a waved shape.

2. The racket as claimed in claim 1, wherein said concavities (27, 54, 64, 76, 86) of said two annular surfaces (26, 52, 62, 74, 84) correspond to each other in a pair manner.

3. The racket as claimed in claim 1, wherein said concavities (27, 54, 64, 76, 86) of said two annular surfaces (26, 52, 62, 74, 84) are arranged in a staggered manner.

4. The racket as claimed in claim 1, wherein said inner circumference surface (22) is provided with a plurality of necks (23) between each two of which a hole (28) of said head frame (20, 66, 72, 82) is located.

5. The racket as claimed in claim 1, wherein said inner circumference surface (44) is provided with a plurality of necks (46) at each of which a hole (42) of said head frame (41) is located.

6. The racket as claimed in claim 1, wherein said inner circumference surface (56) has a continuous S-shape.

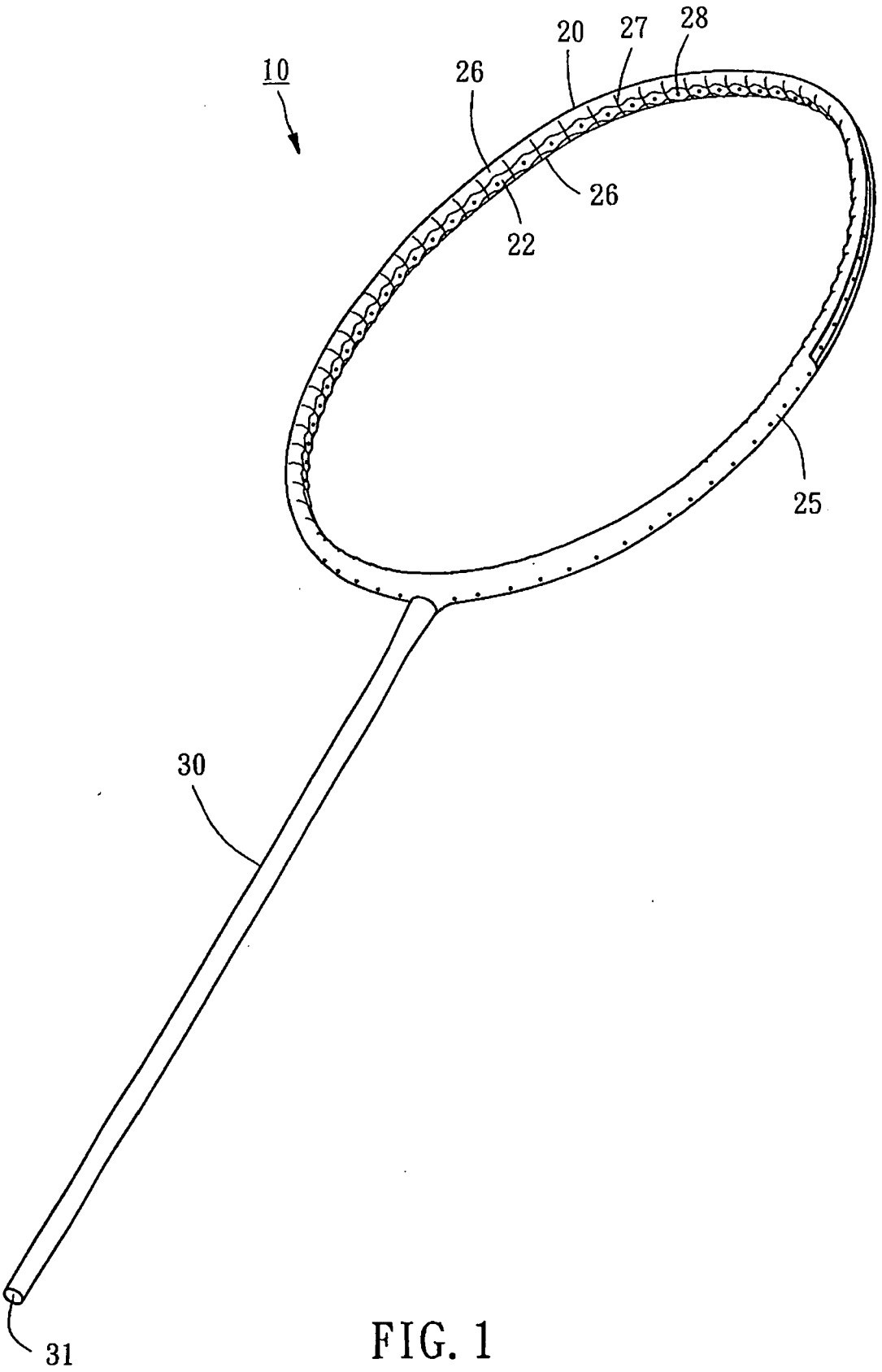

FIG. 1

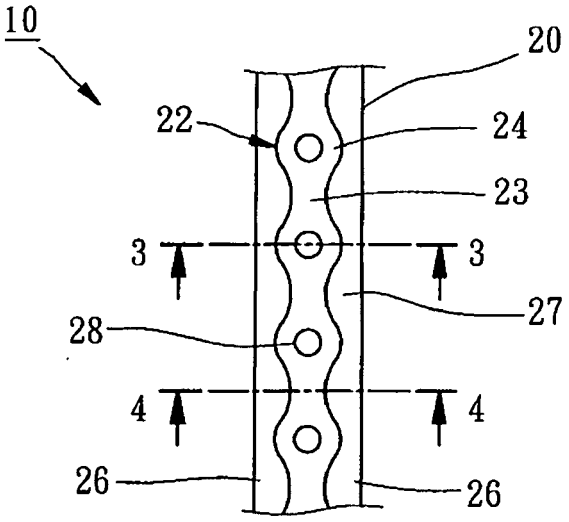

FIG. 2

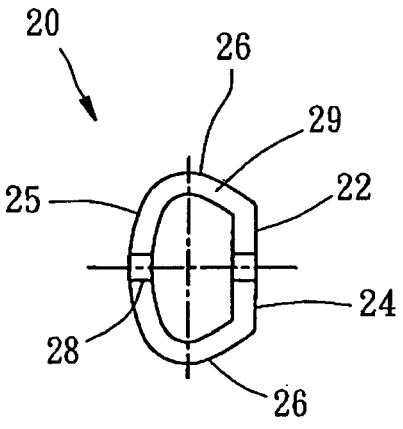

FIG. 3

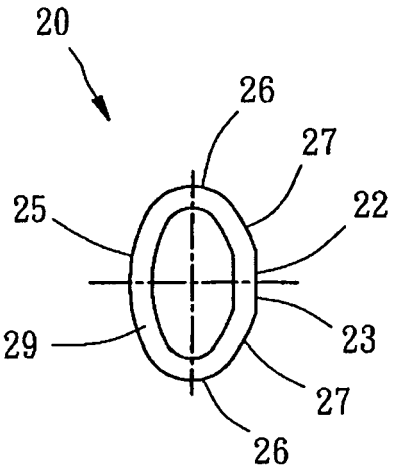

FIG. 4

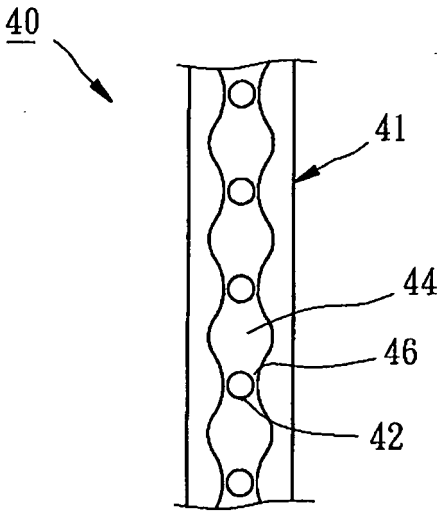

FIG. 5

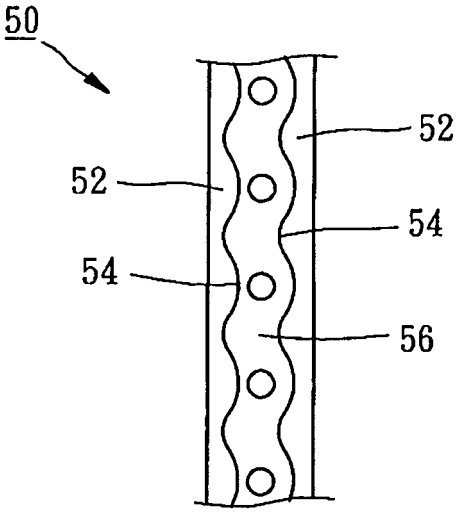

FIG. 6

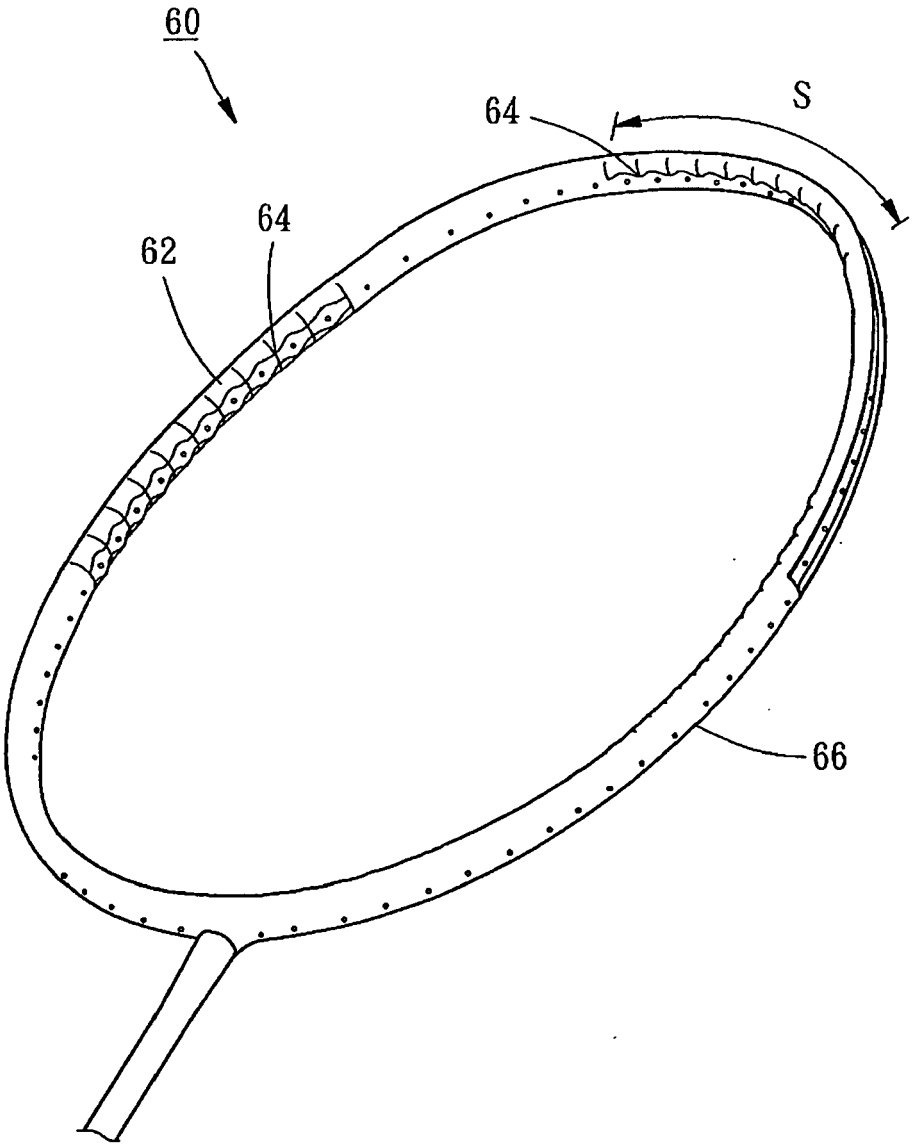

FIG. 7

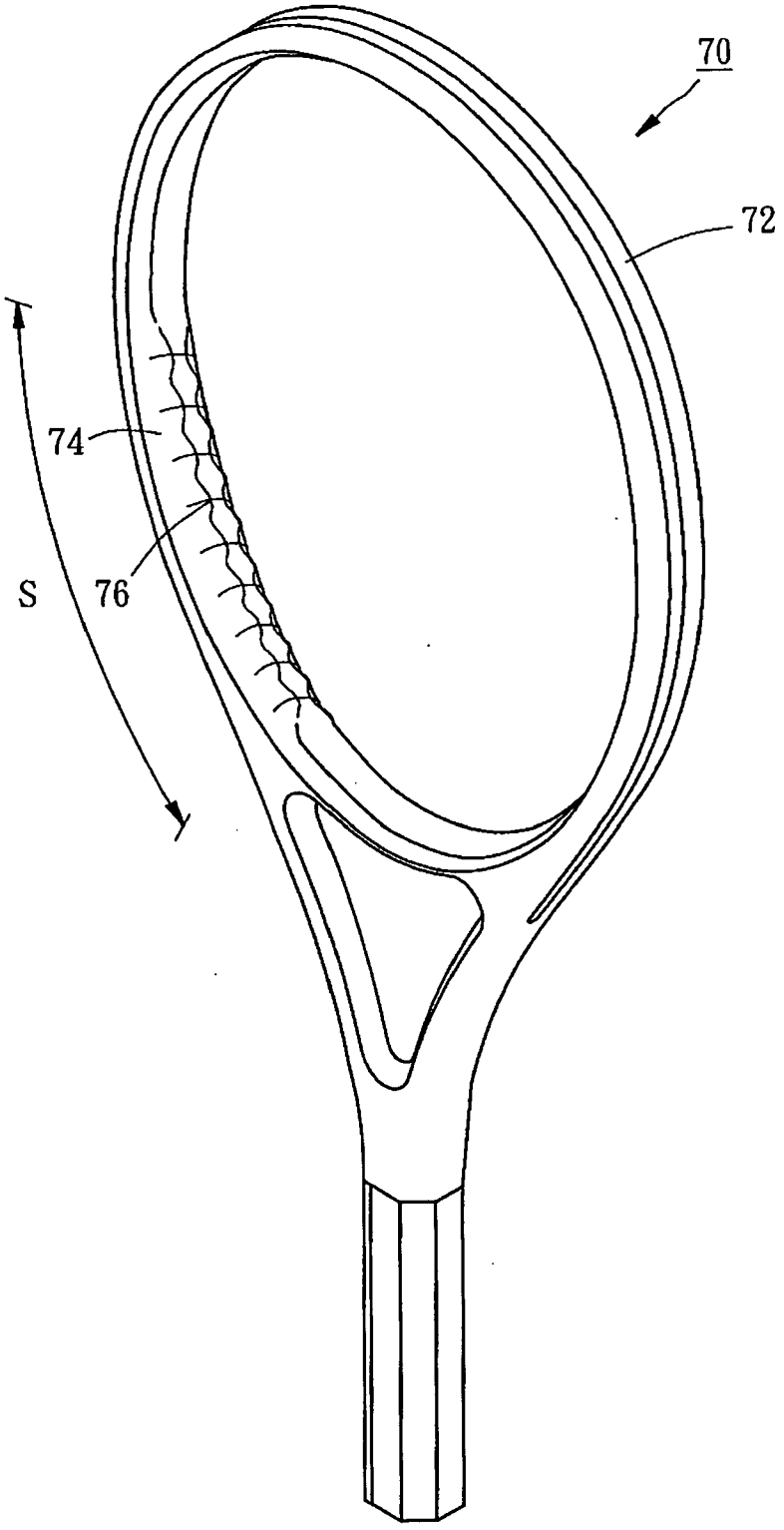

FIG. 8

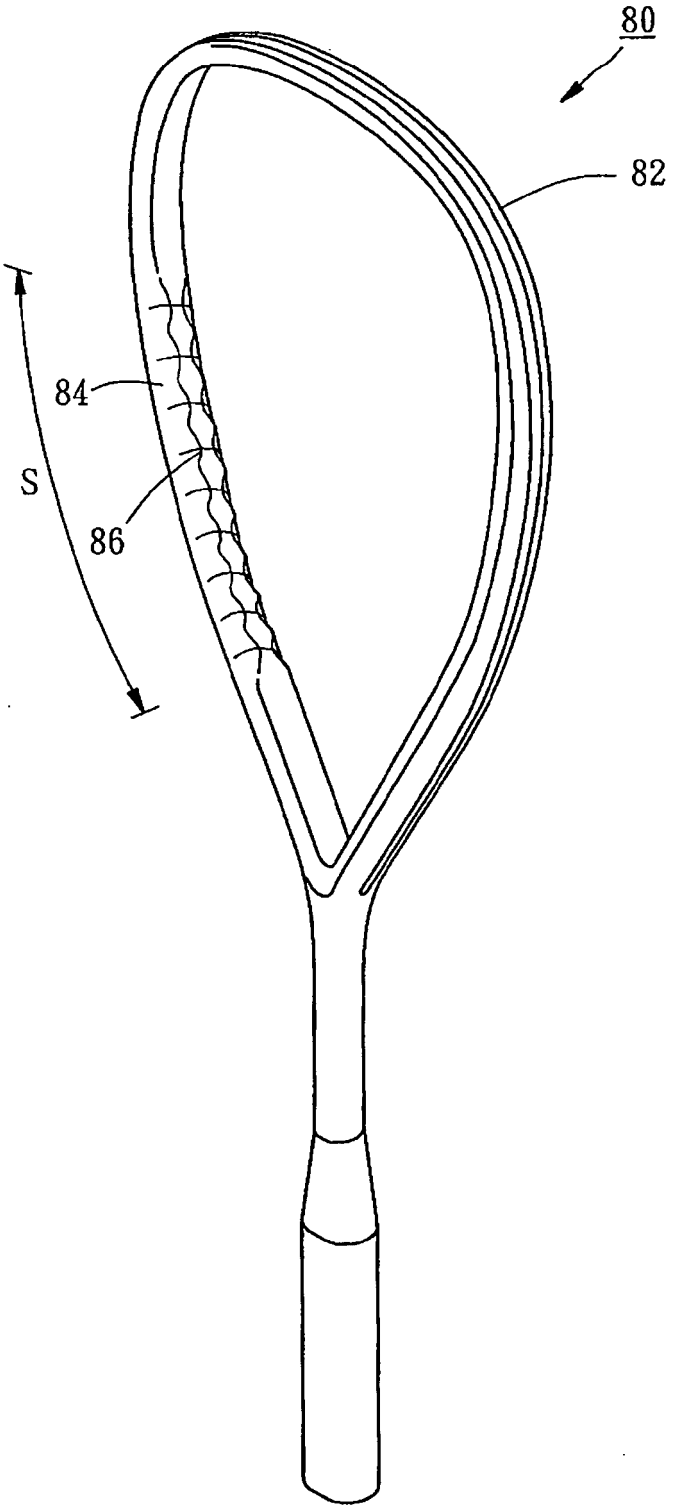

FIG. 9

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 01 5410

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 1 149 607 A (EF COMPOSITE TECHNOLOGIES LP [US]) 31 October 2001 (2001-10-31) * the whole document *	1-6	INV. A63B49/02
X	DE 20 2005 011325 U1 (YUAN MIN AN ENTPR CO [TW]) 17 November 2005 (2005-11-17) * the whole document *	1-6	

TECHNICAL FIELDS SEARCHED (IPC)

A63B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	10 December 2007	Tejada Biarge, Diego

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 07 01 5410

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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10-12-2007

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82