SPECIFICATION

Sports rackets

The present invention relates to sports rackets, particularly to light rackets whose frames are reinforced with graphite fiber.

Badminton is a very popular game and a considerable number of badminton courts have been constructed in recent years with more than fifty million people playing badminton and badminton competitions being held all over the world.

Many experts have devoted themselves to improve the structure of badminton rackets, the problem being to minimize the weight of the racket while increasing its strength so as to make it more suitable for cutting and smashing shuttlecocks. Usually, the center of gravity of a conventional badminton racket made of wood or other material is located at the center-point of the racket length. The center of gravity is therefore much too close to the racket head and use of the conventional badminton racket is prone to waste a player's energy and make him tired.

One method of lowering the center of gravity is to make the handle of a racket heavier. However the resulting racket has not proved strong enough for smashing and cutting shuttlecock.

The badminton racket marketed under the trade name "YONEX" has long enjoyed good reputation for its quality; however the "YONEX" racket is approximately 125 to 130 grams in weight, and the thickness of the frame of the racket is more than 12 millimeters. Though there are many kinds of badminton rackets made of metal, their weight, elasticity, shock reduction and balance are not satisfactory. As a result, best-quality badminton rackets are all made of wood but still suffer from the problems outlined above.

The main object of the present invention is to provide an improved sports racket, wherein the weight is minimised while maintaining satisfactory smashing power.

Accordingly the present invention provides a sports racket reinforced with graphite fiber, comprising a handle, a central shaft and a substantially wooden frame, wherein at least one groove is formed in said frame and contains graphite fiber reinforcement therein which bonds with the surrounding wood.

In one embodiment of badminton racket according to the present invention the two bow sides of the frame thereof are provided with two respective grooves which are injected with reinforcing graphite fiber, thereby increasing the strength of the racket.

Advantageously the thickness of the frame reduces toward its upper end, and the thickness of the upper end thereof may be reduced to less than 10.2 millimeters. Therefore, the center of gravity may be properly lowered so as to reduce the shock and the burden on the player's arm.

The present invention is further described hereinafter, by way of example with reference to the accompanying drawings, in which:

Figure 1 is a plan view showing an improved badminton racket according to the present invention;

Figure 2 is a side view of the badminton racket of Figure 1; and

Figure 3 is a sectional view taken along line A-A of Figure 1.

Referring to the drawings, these show a preferred form of badminton racket which comprises a handle 12, a central shaft 11 and a wooden frame 10, the length from the base 200 of the handle 12 to the upper end 100 of the frame being 26 inches.

The bow sides 102, 103 of the frame are provided with two grooves, one each in their upper and lower faces (Figure 3), and mixed viscous graphite fiber is injected into the grooves and heated to 165°C for 30 minutes to present even and smooth upper surfaces 14 and 15. The graphite fiber integrally combines with the surrounding wood of the racket. The racket strings 13 (only one of which is shown in Figure 3) are attached to the frame between the graphite fiber reinforcements 14, 15.

The graphite fiber applied here is celion 6000, usually adopted to fabricate space-construction elements, being made from precursor of polyacrylonitrile. The surface of said graphite fiber is hard and light after being properly treated. Owing to its strong adhesion to organic polymer, the graphite fiber integrally combines with said frame 10. The total weight of the badminton racket is reduced to between 115 and 120 grams. The frame 10 as shown in Figure 2 may be curved as desired. The thickness of said upper end 100 is reduced to less than 10.2 millimeters, and the cross-section 101 of said frame being 18.5 to 19.5 inches away from said bottom 200 is reduced to less than 11.5 millimeters.

The center of gravity may accordingly be lowered to point 17 (shown in Figure 1), being 12 to 12.5 inches away from said bottom 200 of the handle 12, which is the best location for the center of gravity of a badminton racket. The improved badminton racket is also strong enough for smashing and cutting shuttlecock.

The use of graphite fiber to reinforce a badminton racket enables the whole weight of the improved badminton racket to be decreased to a certain extent, and the center of gravity thereof lowered to a suitable position.

CLAIMS

1. A sports racket reinforced with graphite fiber, comprising a handle, a central shaft and a substantially wooden frame, wherein at least one groove is formed in said frame and contains graphite fiber reinforcement therein which bonds with the surrounding wood.

2. A racket as claimed in Claim 1, wherein the thickness of the upper end of said frame is less than 10.2 millimeters.

3. A racket as claimed in Claim 1 or 2, wherein the thickness of said frame at a location 18.5 to 19.5 inches away from the base of said handle is less than 11.5 millimeters.

4. A racket as claimed in any of claims 1 to 3 in the form of a badminton racket.

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5. A racket substantially as hereinbefore described with reference to the accompanying drawings.

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