1,198,800

PATENT SPECIFICATION

DRAWINGS ATTACHED

1,198,800

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COMPLETE SPECIFICATION

Improvements in or relating to Racket Frames

We, CARLTON SPORTS COMPANY LIMITED, formerly THE CARLTON TYRE SAVING COMPANY LIMITED, of Shire Hill, Saffron Walden, Essex, a British Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to racket frames and more particularly to a type of racket frame formed from, or including, a metal tube having integral flanged apertures for the strings of the racket, the flanges projecting towards the interior of the tube. Such a frame may be incorporated in a racket such as a badminton, tennis or squash racket.

In this specification by the "frame" of a racket is meant the looped portion within which the stringing is carried out, as distinct from the shaft of the racket which connects the frame to a handle. Moreover, by an "integral flanged aperture" is meant that metal of the tube surrounding a hole in said tube is used to form a flange, the inner edge of said surrounding metal having been turned at least through substantially 90° from its original position in the tube, at least in the longitudinal direction of said tube, so that said flange forms a seating for the stringing.

According to the invention there is provided a racket frame comprising a metal tube having substantially aligned integral flanged apertures in its inner and outer sides, characterised in that, at least in the longitudinal direction of the tubular frame, the size of the opening of an aperture in one of said sides is larger than the corresponding size of the opening of the aligned aperture in the other of said sides.

The inner edge of the surrounding metal of the smaller size integral flanged aperture in said other side may be bent through an angle greater than 90° from its original position, at least in said longitudinal direction.

Preferably some or all of the integral flanged apertures in the outer side of the tubular frame have larger openings than the respectively aligned integral flanged apertures in the inner side of said tubular frame, at least in the longitudinal direction of said tubular frame.

In order that the invention may be clearly understood and readily carried into effect it will now be more fully described with reference to the accompanying drawings, in which:

Figure 1 shows a racket having a frame according to one embodiment of the invention, and

Figure 2 is a section, on an enlarged scale, of a part of the frame of the racket of Figure 1, taken in a plane which bisects the racket frame and is parallel to the plane of Figure 1.

The invention will be described with reference to the drawings, by way of example, as applied to a badminton racket, although it may alternatively be applied to other rackets having frames for stringing, such as tennis or squash rackets.

The badminton racket shown in Figure 1 comprises a frame 1 for stringing, formed from a metal tube having flanged apertures therein as will be more fully described hereinafter. The racket also comprises a shaft 2 and a handle 3, the shaft 2 connecting the frame 1 to the handle 3 as shown. In the embodiment illustrated the shaft 2, which may be a tubular metal shaft, is separately formed from the frame 1 and is secured thereto by welding as indicated by the reference numeral 4. Alternatively the shaft 2 may comprise two metal tubes or one or two solid metal rods secured to the frame 1, or may be integral with said frame 1, being formed by an extension of one or both ends of the metal tube forming the frame 1. The handle 3 may be of moulded plastics, or other suitable material.

As can be seen in Figure 2 flanged apertures are provided in the metal tube forming the frame 1, both in the inner and

outer sides of said frame 1, the inner flanged apertures 5 being substantially aligned with the respective outer flanged apertures 6, so that stringing (not shown) may be applied to the frame 1 by passing it through aligned pairs of flanged apertures 5 and 6. In the present embodiment the openings of the outer flanged apertures 6 are all larger than the openings of the respective aligned inner flanged apertures 5 in the plane of the section of Figure 2 which passes longitudinally through the frame 1. Moreover the inner edge 7 of the surrounding metal of each of said inner flanged apertures 5 is bent through an angle greater than 90° from its original position, at least in the plane of the section of Figure 2.

The frame 1 is also provided with a plurality of recesses or grooves 8 in the outer side thereof respectively between adjacent outer flanged apertures 6 to accommodate stringing between said apertures 6. If desired, however, the grooves or recesses 8 may be omitted.

When stringing is applied to the frame 1 the strings will pass through said frame 1 at an angle other than 90° to the axis of the metal tube due to the different sizes of the openings in aligned pairs of inner and outer flanged apertures, in the longitudinal direction of the frame 1. By turning the edges 7 of the inner apertures 5 through an angle greater than 90° it can be arranged that said edges 7 are out of the paths of the inclined strings. The inner edges of the outer flanged apertures 6 are turned through substantially 90° from their original positions in the metal tube, and this may be slightly less than 90° in this embodiment due to the inclination of the strings. In one specific embodiment the inner edges 7 of the inner apertures may be turned through 93° from their original positions in the metal tube in the longitudinal direction of said tube.

In order to form the frame 1, the metal tube may be as defined in the complete specification of Patent No. 1,112,028 or of Patent No. 1,112,029 and may be formed into the frame 1 and have the flanged apertures 5 and 6 formed therein as described in the respective complete specification. In order to bend the inner edges 7 through an angle greater than 90° this may be achieved by inserting a suitable forming tool through the aligned larger apertures 6.

If desired the size of the openings of the flanged apertures in the outer side of the tubular frame may be arranged to be greater than those of the aligned flanged apertures in the inner side of the tubular frame in all directions across said openings. Moreover, if desired, the positions of the larger and smaller opening flanged apertures may be reversed, i.e. the openings of the flanged apertures in the inner side of the tubular frame may be larger than the openings of the respective aligned flanged apertures in the outer side of the tubular frame, at least in the longitudinal direction of said tubular frame. In this event the inner edge of the metal forming the flange of each flanged aperture in said outer side may be turned through an angle greater than 90° from its original position in the metal tube.

Although the invention has been especially described with reference to its application to a badminton racket frame, it may alternatively be applied to frames for other strung rackets, such as tennis or squash rackets, the frames being formed from or comprising a metal tube having integral flanged apertures for the racket stringing.

WHAT WE CLAIM IS:—

1. A racket frame comprising a metal tube having substantially aligned integral flanged apertures in its inner and outer sides, characterised in that, at least in the longitudinal direction of the tubular frame, the size of the opening of an aperture in one of said sides is larger than the corresponding size of the opening of the aligned aperture in the other of said sides.

2. A racket frame as claimed in Claim 1 characterised in that the inner edge of the surrounding metal of the smaller size integral flanged aperture in said other side is bent through an angle greater than 90° from its original position in the metal tube, at least in said longitudinal direction.

3. A racket frame as claimed in Claim 1 or 2, characterised in that the larger opening aperture is in the outer side of said frame.

4. A racket frame as claimed in Claim 1, 2 or 3, characterised in that all of the integral flanged apertures in one side of said frame have larger openings than the respective aligned integral flanged apertures in the other side of said frame.

5. A racket frame substantially as described with reference to the accompanying drawings, or modified as herein described.

6. A racket having a frame for stringing as claimed in any preceding claim.

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1198800 COMPLETE SPECIFICATION
1 SHEET *This drawing is a reproduction of the Original on a reduced scale*

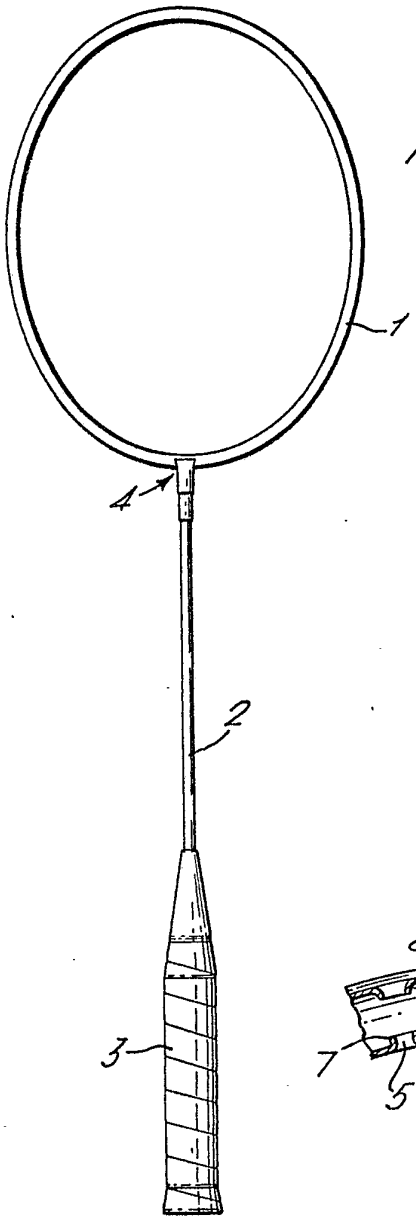

Fig. 1.

Fig. 2.