1,166,078

PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Improvements in or relating to Racket Frames

We, CARLTON SPORTS COMPANY LIMITED (formerly known as 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 for rackets for use, for example in badminton, tennis and squash.

In this specification the term "frame" means the looped portion of a racket within which stringing is carried out, as distinct from the shaft of the racket which connects the frame to the handle.

It has been proposed to make rackets having metal frames, but difficulties have been encountered in applying stringing to such frames since the sharp edges around holes in such frames tend to sever the strings either during the actual stringing operation itself or in use of the racket. Plastic tubes have been used to protect the strings but such tubes move in use and make stringing more difficult.

It is an object of this invention to provide a metal racket frame having holes for stringing, whereby the difficulties indicated above are alleviated.

According to the invention there is provided a metal racket frame having holes therethrough for stringing, and a flanged sleeve of plastics material in such a hole, the plastics material being such as permanently to deform under the tension of stringing applied to said frame. Such a material is nylon 11, but the invention is not limited to this material.

The plastics sleeve is formed with an outwardly directed flange at one end thereof, and in one embodiment of the invention the flanged end of the sleeve is arranged to be at the outside of the racket frame. The interior surface of the flanged end of the sleeve is preferably curved and is arranged to extend over the outside of the frame surrounding the hole in which said plastics sleeve is provided. The other end of the plastics sleeve, which lies at the inside of the racket frame is undeformed in the unstrung state of the racket frame and arranged to extend beyond the inside edge of the respective hole. When stringing is applied to the racket frame said other end of the plastics sleeve may become deformed by the respective string which passes through the hole, particularly when two strings leave the sleeve in different directions. Alternatively said other end may be bent outwardly to overlie the inside of the frame surrounding the hole before stringing is applied to the frame. For example, said other end may be flanged similarly to said one end of the plastics sleeve.

The metal racket frame may be of any suitable construction. By way of example it may be formed from a metal tube as described in the complete specification of any of cognate Patent Applications Nos. 2401/66 and 8549/66 (Serial No. 1,112,028), 9964/67 and 29625/67 (Serial No. 1,112,029) or 9965/67 and 29626/67 (Serial No. 1,112,030) the holes in the metal tube having integral flanges projecting towards the interior of the tube. In such embodiments said one end of the plastics sleeve is arranged to extend over the integral flange of the respective hole at the outside of the frame.

By an "integral flange" is meant that the metal of the tube surrounding a hole in said tube is used to form the flange, the inner edge of said surrounding metal having been turned 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 smooth surface for the stringing.

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 metal

frame and plastics sleeves in holes in said frame in accordance with one embodiment of the invention,

Figure 2 is a view, on an enlarged scale, of part of the outside of the racket frame shown in Figure 1, and

Figure 3 is a longitudinal section through part of the racket frame, also on an enlarged scale.

The invention will be described, with reference to the three figures of the drawings, by way of example as applied to a racket frame of a racket suitable for use as a badminton racket and in which said racket frame is formed from a metal tube. The racket frame is indicated in the drawings by reference numeral 1, and the racket shown in Figure 1 also comprises a shaft 2, which may be a tubular metal shaft, which is welded at 3 to the frame 1, and a suitable handle 4 provided at the end of the shaft 2 remote from the frame 1 in well known manner. The handle may be made from moulded plastics material or may be of any other suitable form. Although in this embodiment the shaft 2 is separately formed from and welded to the frame 1 it may alternatively be constituted by an extension of one or both ends of the metal tube forming the frame 1. Stringing for the racket frame is not shown in Figure 1 of the drawings.

The frame 1 may be as described in the complete specification of cognate Patent Applications Nos. 2401/66 and 8549/66 (Serial No. 1,112,028) or 9964/67 and 29625/67 (Serial No. 1,112,029) or 9965/67 and 29626/67 (Serial No. 1,112,030) with reference to Figures 1 to 5 of the drawings of the respective applications. Accordingly the metal tube of the frame is provided with a plurality of holes 5 therethrough positioned to accommodate the racket stringing. The holes 5 are bounded by integral flanges 6 formed from the metal of the tube both on the inside and the outside of the frame. The flanges 6 can be seen in Figure 3 and project towards the interior of the metal tube. In addition, the outside of the frame 1 is formed with a recess or groove 7 to accommodate the strings between the holes 5, although this groove may be omitted if desired.

Each hole 5 contains therein a sleeve 8 of plastics material which, as can be seen in Figure 3 extends through the respective hole from the outside to the inside of the racket frame, thus overlying both of the edges of the metal surrounding the hole. The plastics material is such as permanently to deform under the tension of stringing applied to the racket frame. In the particular embodiment shown each sleeve 8 is formed with an outwardly directed flange 9 at one end and the flanged end is arranged to lie at the outside of the racket frame. Thus, as can be seen in Figures 2 and 3, the flange 9 overlies the flange 6 of the respective hole at the outside of the racket frame 1. The other end of the sleeve 8 is of straight tubular form, i.e. is undeformed, as can be seen most clearly in Figure 3, and accordingly, the sleeves 8 can readily be inserted into the holes 5 from the outside of the racket frame by inserting said other end first. The length of the sleeve 8 is arranged to be such that said other end thereof projects just beyond the inside of the frame 1 as can be seen in Figures 1 and 3. When stringing 10 is applied to the racket frame 1 the projecting end may become deformed by said stringing. Alternatively, said other end of the sleeve 8 may be deformed, such as by being flanged outwardly using a suitable heated forming tool, prior to the application of stringing. Thus said other end of the sleeve 8 can be made to overlie the flange 6 of the respective hole at the inside of the racket frame. As can be seen most that the interior of the sleeve 8 at said one end is curved. This forms a smooth seating for the strings of the racket at the outside end of the respective hole.

The sleeves 8 are made of nylon 11 but other suitable plastics materials may be used.

Although the invention has been described with particular reference to the embodiment thereof shown in the drawings, that embodiment may be modified in various ways without departing from the scope of the appendant claims. By way of example the invention may be applied to a racket frame of a racket suitable for use as a tennis or squash racket, for example formed as described in the complete specification of cognate Patent Applications Nos. 2401/66 and 8549/66 (Serial No. 1,112,028) or 9964/67 and 29625/67 (Serial No. 1,112,029) or 9965/67 and 29626/67 (Serial No. 1,112,030) with reference to Figures 6 and 11 of the respective applications. Alternatively the racket frame may be of other construction such as of tubular elliptical form or solid section.

WHAT WE CLAIM IS:—

1. A metal racket frame having holes therethrough for stringing and a flanged sleeve of plastics material in such a hole, the plastics material being such as permanently to deform under the tension of stringing applied to said frame.

2. A racket frame as claimed in Claim 1 in which said plastics material is nylon 11.

3. A racket frame as claimed in Claim 1 or 2 in which said sleeve is formed with an outwardly directed flange at one end disposed at the outside of the said racket frame.

4. A racket frame as claimed in Claim 3 in which the interior surface of said flanged end of the sleeve is curved.

5. A racket frame as claimed in Claim 3 or 4 in which said sleeve is formed with an outwardly directed flange at its other end disposed at the inside of the racket frame.

6. A racket frame as claimed in any preceding claim in which said frame is formed from

a metal tube having holes with integral flanges projecting towards the interior of the tube.

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

8. A racket having a frame as claimed in any preceding claim.

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

FIG.1.

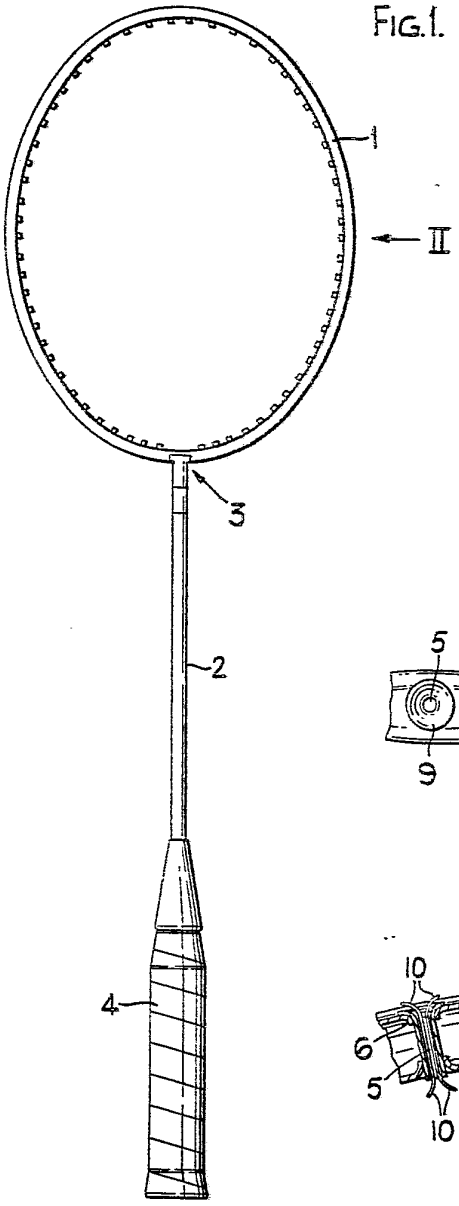

FIG.2.

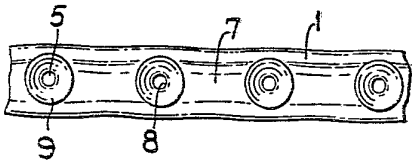

FIG.3.