United States Patent

[11] 3,556,524

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[21] Appl. No. **557,023**
[22] Filed **June 13, 1966**
[45] Patented **Jan. 19, 1971**
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[32] Priority **Mar. 18, 1966**
[33] **Great Britain**
[31] **No. 12,055/66**

[54] **METHOD OF MANUFACTURING RACKETS**
1 Claim, 1 Drawing Fig.

[52] **U.S. Cl.** **273/73,** 117/132
[51] **Int. Cl.** **A63b 49/00**
[50] **Field of Search** ..... 273/73(4), 73(8), 73(3); 117/132; 124/23

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ABSTRACT: A frame for a badminton, squash or tennis racket is made by forming a hollow metal tube with a recess or groove extending longitudinally so that the strings of the racket may nest therein; forming a plurality of holes in opposite walls of the tube, with the edges of each of the holes having flanges whose free edges are inside the tube; heating the tube, then plunging the tube into a mass of a suitable nylon powder through which air is constantly passing; agitating the tube to cause a nylon coat to cover and adhere to all the outer surfaces of the tube and the flanges including the free edges thereof, thereby to cover the sharp edges of the metal around the holes; and removing the tube and preparing it for stringing. In a modification, a solid metal extrusion is used instead of a hollow tube, holes are drilled in the extrusion at suitable intervals for the strings, eyelets are fitted in said holes to cover the sharp edges of the holes, then the same process is followed to put a nylon coat on the outside of the extrusion and on the eyelets.

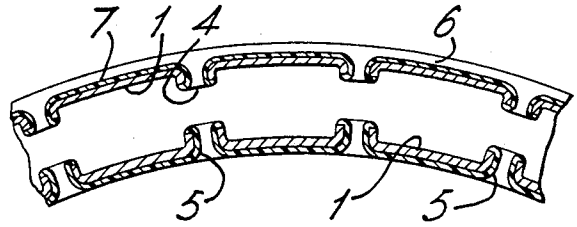


Fig. 1.

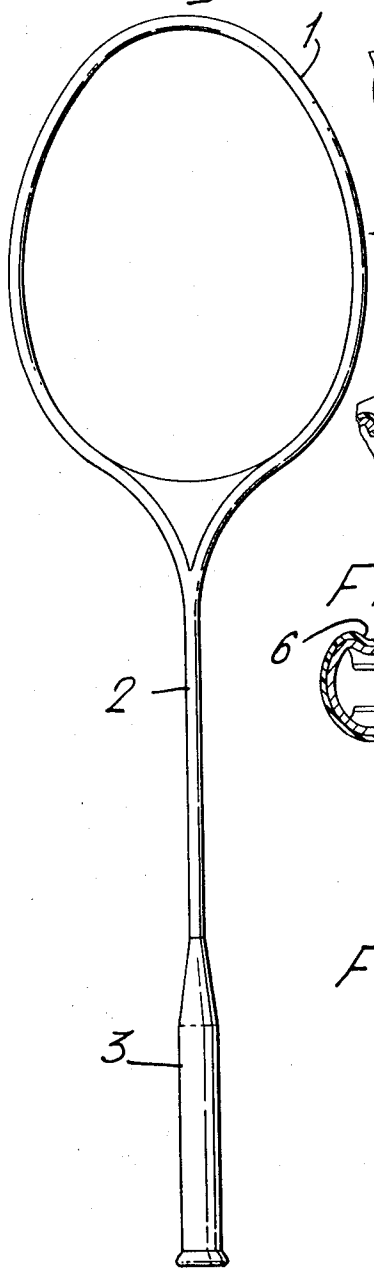


Fig. 2.

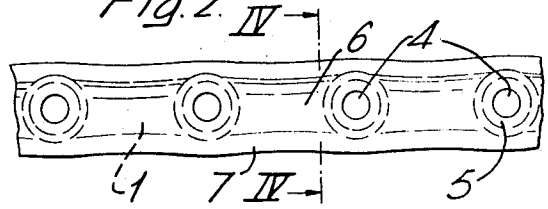


Fig. 3.

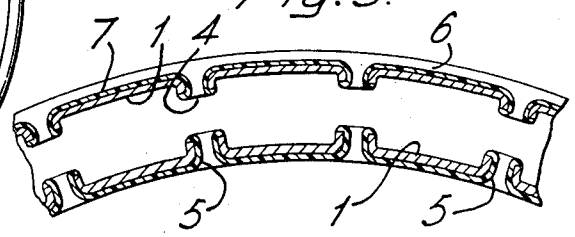


Fig. 4.

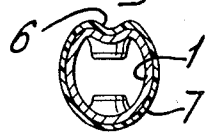


Fig. 5.

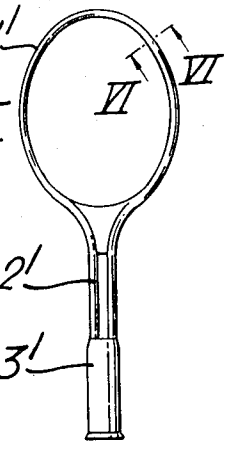
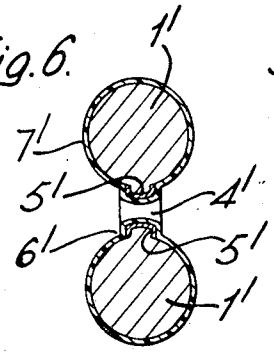


Fig. 6.



METHOD OF MANUFACTURING RACKETS

This invention relates to rackets, for example to Badminton, Tennis and Squash rackets, which incorporate a strung frame, and to methods of manufacturing such rackets.

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

Rackets with metal frames are known but it has been found that such rackets suffer from the disadvantage that when the metal frame is apertured and stringing is applied to the frame through the apertures, the sharp edges of the metal around the apertures frequently sever the strings, either during the actual stringing process or during subsequent use of the racket.

It is an object of this invention to provide in a racket having a suitable metal frame a means whereby the above indicated disadvantage can be alleviated.

According to one feature of the invention there is provided a racket having a suitable metal frame for stringing, characterized in a coating on said frame of a plastics material which has been formed by the application of powdered plastics material to the heated surface of the frame prior to the application of stringing to the frame.

According to another feature of the invention there is provided a method of manufacturing a racket having a metal frame for stringing, characterized in applying to the heated surface of said frame powdered plastics material so that said material melts and forms a plastics coating on said frame, prior to the applications of stringing to the frame.

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

FIG. 1 is an elevation of a badminton racket to which the invention is to be applied;

FIG. 2 is an elevation on an enlarged scale of a part of the frame portion of the racket to which the invention is to be applied;

FIG. 3 shows, on the same scale as FIG. 2, a longitudinal section through the part of the racket frame illustrated in FIG. 2 but after the invention has been applied;

FIG. 4 shows a section on line IV–IV of FIG. 2 but after the invention has been applied;

FIG. 5 is an elevation of a racket having a frame of different cross section to which the invention is to be applied; and

FIG. 6 shows, on an enlarged scale a section on line VI–VI of FIG. 5 but after the invention has been applied.

Referring now to FIGS. 1, 2, 3, and 4, the looped portion or frame 1 of the racket is made, in this instance of tubular steel, the shaft 2 is also made of steel, and joined to the frame 1 by welding or integral with it. The handle 3 is suitably connected

to the shaft 2. The tubular section 1 has on the outside a hollow or groove 6 in which the strings may nest. The tube is provided with a number of holes 4 on opposite walls, the edges of these holes being provided with flanges 5, the free edges of which are towards the inside of the tube. The holes 4 and flanges 5 are so positioned that the strings may pass straight through them from the inside to the outside of the frame.

After the frame 1 has been completed and, if the shaft 2 is being attached as in this case by welding, after the shaft 2 has been attached, and any heat treatment operations have been completed, the metal frame is preferably lightly etched and is then heated to, in this instance, a temperature of about 425° C. and is then immediately plunged into a heap of a suitable nylon powder through which air is passing. The frame is then agitated and a nylon coat 7 will cover and adhere to the surface of the frame and particularly the flanges and the edges of the holes. The coating 7 around the holes achieves two results, first it enables a tapered spike to be used to fix the strings in place during the stringing or restringing operation, and secondly it covers the sharp edges of the metal around the holes and provides a surface upon which the strings bed and alleviates the breakage of the strings.

Referring now to FIGS. 5 and 6, the frame 1′ is, in this instance, made of a solid extrusion, shown in cross section in FIG. 6. Holes 4′ are provided for the strings and into these holes are fitted eyelets 5′ which cover the sharp edges of the holes. The extrusion is so designed that a recess 6′ is provided in which the strings may nest and are to some extent protected from accidental damage. The frame is then given its nylon coat 7′ in similar manner to the previously described example. The nylon coats the eyelets as well as the frame and achieves a similar result to that in the previous example.

The invention is not limited to the types of racket frames described and other suitable metal frames may be used.

I claim:

1. A method of manufacturing a badminton, tennis or squash racket frame which comprises starting with a length of tubular steel; forming a hollow or groove on the side of the tube which is to be outside of the frame, said hollow or groove being suitably formed so that the strings of the racket may nest therein; forming a plurality of holes in opposite walls of the tube in such a manner that the edges of each of the holes are provided with flanges whose free edges are inside the tube; heating the tube to an elevated temperature then plunging the tube into a mass of a suitable nylon powder through which air is constantly passing; agitating the tube to cause a nylon coat to cover and adhere to all the outer surfaces of the tube and said flanges including the free edges thereof, thereby to cover the sharp edges of the metal around the holes; and removing the tube and preparing it for stringing.