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(54) BADMINTON RACKET

(71) We, KABUSHIKI KAISHA YONEYAMA RACKET, a body corporate organised under the laws of Japan, of No. 900-1, Oaza-Tsukanoyama, Koshiji-machi, Santo-gun, Niigata-ken, Japan, 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 a badminton racket having an improved T-shaped joint connecting the racket frame to a shaft.

In a known badminton racket, a T-shaped joint is used to connect a metal frame to a shaft. The T-shaped joint is normally made by die-casting and comprises a first orifice in a sleeve portion which is adapted to receive and be tightly conected to a shaft, and a second orifice which is at right angles to the first in the shoulder portions of the T-shape which is adapted to receive and to be tightly connected to the end portions of a racket frame. In a preferred form, both of the end portion of the frame provided with a plurality of mutually parallel concave grooves and the T-shaped joint is provided with a plurality of projecting strips on the inner surface of the second orifice which are adapted to be tightly fitted in to the grooves. The end portions of the frame are connected together and to the joint by adhesive.

Such a badminton racket has many advantages for example reduction in the likelihood of cracks and breaks forming in the racket frame at the joint, and the provision of a light but strong racket which can withstand flexing of the shaft without any permanent deformation of the racket.

However, some disadvantages are experienced with such rackets. Firstly, it is very difficult to insert equal lengths of the opposite end portions of the racket frame into the second orifice, since one end of the frame contacts the other end thereof and may push the latter away from the centre of the second orifice. If this occurs, the frame is incorrectly fixed to the joint and the shaft. Secondly, adhesive which has been coated onto the inner surface of one side of the second orifice may be scraped off by the surface of the frame end portion inserted therein and may be pushed to the other side of the second orifice. This may cause poor and uneven adhesion of the frame to the joint. Thirdly, if apertures are made to receive eyelets for threading gut through the shoulder portions of the T-shaped joint symmetrically with respect to a vertical centre plane of the joint, the joint itself is weakened and may be cracked or broken when used repeatedly.

Accordingly, an object of the present invention is to provide a badminton racket which allows both end portions of a racket frame to be inserted to equal depths into the shoulder portions of a T-shaped joint adapted to connect a racket frame to a shaft, the T-shaped joint having sufficient strength to allow apertures to be made therethrough.

According to the present invention, there is provided a badminton racket comprising a T-shaped joint, the transom of the T-shaped joint having an orifice extending into each of its ends, the leg portion having a recess extending into its end, a tubular racket frame having two end portion, each of which are located within a respective one of the two orifices, and a shaft, one end of which is located within the recess, the said orifice being of the same depth as each other and being separated by a central partition wall which is integrally formed with said transom, each of the said end portions being in contact with the said central partition wall.

Referring to the accompanying drawings:

Fig. 1 shows a badminton racket embodying the present invention;

Fig. 2 is a ventical sectional view of a

[*Price 25p*]

Price 33p

T-shaped joint adapted to connect a frame to a shaft in accordance with the present invention;

Fig. 3 is a side view of a shoulder portion of the T-shaped joint, and

Fig. 4 is a sectioned side view of an end portion of the racket frame.

Referring now to Fig. 1, a baminton racket according to the present invention is shown which comprises a tubular metal elliptically shaped frame 20, a metal tubular shaft 30, a T-shaped joint 10 connecting the frame 20 to the shaft 30, and a grip 40. The T-shaped joint 10 is shown in detail in Fig. 2 and comprises two substantially horizontal orifices in shoulder portions 11 and a vertical orifice in sleeve portion 12. Each shoulder portion 11 has two opposed projections 13 and 14 formed on the inner surface of the orifice therein, as is shown in Fig. 3. The frame 20 has opposed grooves 23 and 24 formed on each opposite end portion thereof, as is shown in Fig. 4. The racket is assembled by inserting the end portions of the frame into the orifices in the shoulder portions 11 of the T-shaped joint 10 in order that the grooves 23 and 24 may engage with the projections 13 and 14 respectively. The shaft 30 is inserted into the orifice in the sleeve portion 12 of the T-shaped joint. The frame and shaft portions are firmly connected to the T-shaped joint by adhesive.

The T-shaped joint further comprises a central partition wall 15 integrally formed with the shoulder portions 11 to define the two orifices of equal length therein. When the racket is assembled, the ends of the racket frame 20 are in contact with opposite surfaces of the partition wall 15.

Preferably, the cross-section of each of the end portions of the racket frame 20 is elliptical. The elliptical shape of the racket frame 20 also serves, in operation with the engagement between the grooves 23, 24 and the projections 13, 14, to prevent the end portions of the racket frame from rotating within the joint 10.

In Fig. 2, reference numeral 50 designates eyelets of synthetic resin provided through aperture in the shoulder portions 11 of the T-shaped joint 10 and the end portions of the racket frame within the joint.

The assembled badminton racket according to the present invention provides many advantages. Firstly, since both ends of the racket frame 20 are in contact with the central partition wall 15 of the joint, the end portions of the frame 20 are inserted into the orifices in the shoulder portions of the joint 11 to an equal depth. Accordingly, the predetermined elliptical shape of the frame is always obtained. Secondly, even if adhesive which has been coated on the inner surface of one orifice in the shoulder portion of the T-shaped joint is scraped off by the surface of one frame end portion, the adhesive cannot be forced into the other orifice. Accordingly, with the use of a predetermined amount of adhesive, it is possible to obtain the same adhering effects in the joint of many rackets. Thirdly, the central partition wall 15 in the T-shaped joint serves to reinforce the joint. Accordingly, the provision of apertures in the joint, through which the eyelets 50 for threading the gut are inserted does not result in a fragile joint.

WHAT WE CLAIM IS:—

1. A badminton racket comprising a T-shaped joint, the transom of the T-shaped joint having an orifice extending into each of its ends, the leg portion having a recess extending into its end, a tubular racket frame having two end portions, each of which are located within a respective one of the two orifices, and a shaft, one end of which is located within the recess, the said orifices being of the same depth as each other and being separated by a central partition wall which is integrally formed with said transom, each of the said end portions being in contact with the said central partition wall.

2. A badminton racket according to claim 1, wherein each of the end portions of the racket frame is provided with opposed concave grooves and the inner surface of each orifice is provided with corresponding opposed projections, the projections being adapted to tightly fit into the grooves.

3. A badminton racket according to claim 1 or 2, wherein the T-shaped joint is provided with apertures in each of which is located an eyelet of synthetic resin to provide for the threading a gut, said apertures being symmetric with respect to said partition wall.

4. A badminton racket as claimed in any one of the preceding claims, wherein the cross-section of the racket frame end portions is elliptical.

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

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T-shaped joint adapted to connect a frame to a shaft in accordance with the present invention;

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