Sept. 6, 1949. W. T. BROWN 2,481,075

TENNIS RACKET

Filed Jan. 11, 1946

Fig. 1

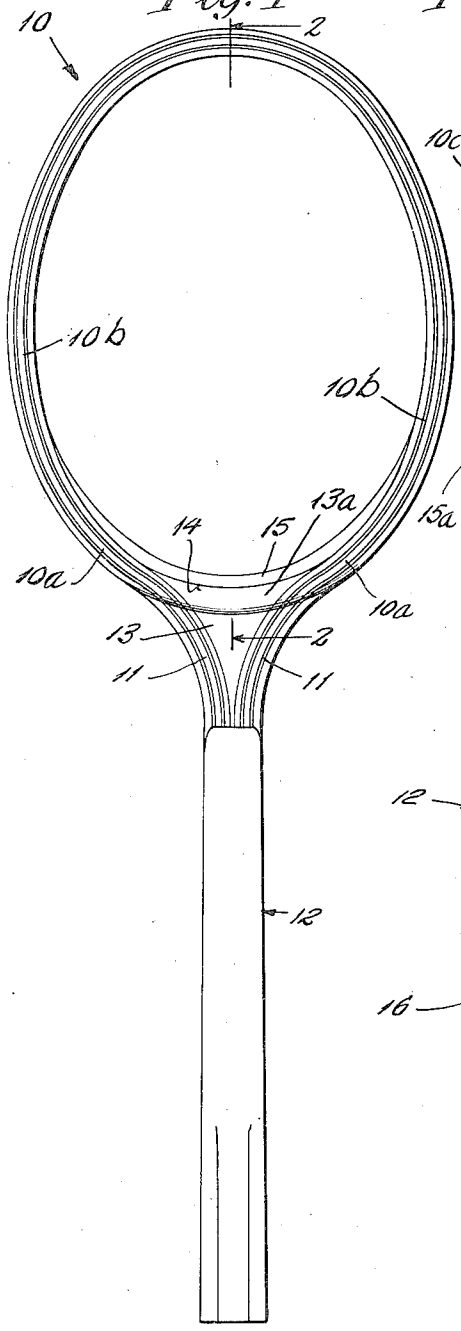



Fig. 2

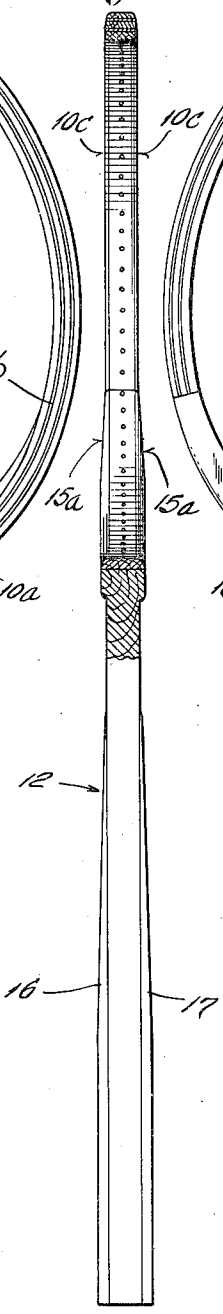



Fig. 3

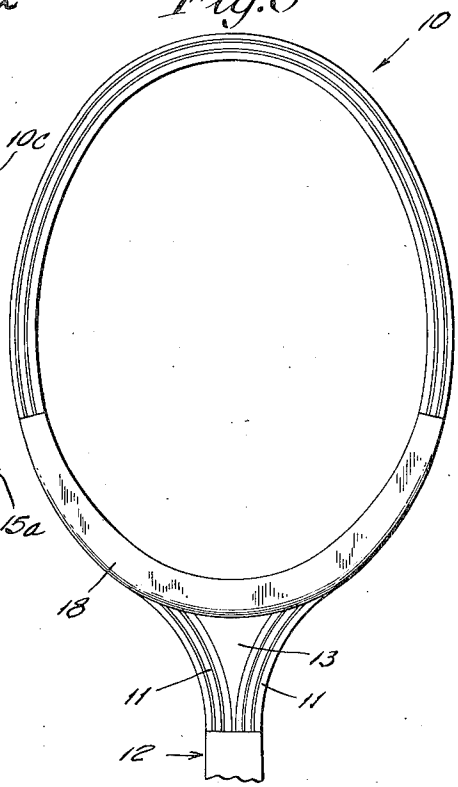
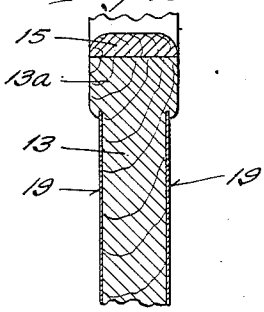



Fig. 4




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## TENNIS RACKET

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Application January 11, 1946, Serial No. 640,453

10 Claims. (Cl. 273—73)

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This invention relates to tennis rackets and the like.

It has been common practice in the past to cover the glue joints and to strengthen the basic structural elements of a tennis racket with various reinforcing pieces, especially at the throat or juncture between the handle and bow of the racket. These reinforcing pieces have taken various shapes, and one racket which has been successful and has had public acceptance has been the racket reinforced with arcuate strips, located at opposite sides of the bow at the handle end, the said strips being shaped so as to complete the oval defined by the bow.

In this type racket, the construction employed has not only been very effective in reinforcing the racket at its point of weakness, but has increased the attractiveness of the racket in the public eye, and has given the suggestion of great strength.

One disadvantage of the arcuate strip is that it is expensive to produce and difficult to properly install and therefore the cost of producing the racket is comparatively high, these rackets being generally in the higher-priced classes.

An object of the present invention is to provide a racket having substantially the identical appearance to the prior racket, and also the equivalent strength thereof while at the same time being more economical in production. I have found that this may be accomplished by making thicker certain portions of a racket so that it has a strength comparable to the reinforced prior type racket, and has practically the identical appearance of the same all without the provision of separate arcuate reinforcing strips which account for the increased cost of the prior rackets.

In carrying out my invention I provide an oval shaped bow having handle extensions, and a throat-piece located between the extensions and shaped to complete the oval defined by the bow, the said throat-piece adjacent the bow and adjoining portions of the bow being made thicker than the remaining portions of these parts, and in conjunction with a correspondingly widened crescent-shaped reinforcement along the interior of the handle end of the bow being shaped and finished to simulate the raised arcuate reinforcements. I thus produce a racket which is extremely durable and withstands considerable hard play and has uniform resiliency of the frame being comparable in strength to the prior racket, and being indistinguishable therefrom in appearance.

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The thicker portions of my improved racket, which simulate the arcuate reinforcements, may be finished with an opaque covering such as a lacquer, thereby to conceal the joints, grain and structure of the racket at these portions and make them appear as separate reinforcements of the prior rackets, or the structure may be finished in natural wood finish with suitable ornamental designs thereon.

A racket constructed in accordance with my invention may be produced much more economically than the prior type racket, involving fewer fabricating and finishing operations, and fewer pieces.

In one form of the invention I provide reinforcing covers secured to each side of the throat of the racket, the said covers being conveniently anchored along one edge by recessing them in the thicker portions of the throat-piece and bow.

Other features and advantages will hereinafter appear.

In the accompanying drawings:

Figure 1 is a front elevation of the improved racket structure of the present invention.

Fig. 2 is a view partly in elevation and partly in section on the line 2—2 of Fig. 1.

Fig. 3 is a fragmentary front elevation of the racket, similar to the view of Fig. 1, but after the application of a finishing coating or medium, and

Fig. 4, illustrating a modification, is a fragmentary axial section through the throat portion of a racket.

As shown, the improved tennis racket of the present invention comprises a bow 10, preferably of laminated structure, bent into the conventional oval shape, the bow having terminal portions or extensions 11 incorporated in a handle 12. Between the handle 12 and the bow 10 the extensions 11 of the latter have a reverse curvature and diverge from each other to form a throat opening in which is secured, as by gluing, or other suitable means a throat-piece 13 of substantially triangular shape, the side edges of the throat-piece conforming closely and being secured to the inner surfaces of the bow extensions 11.

The inner edge 14 of the throat-piece 13 is concave so as to form a continuation of the oval defined by the bow 10. I provide a crescent-shaped reinforcing strip 15, as is usual, at the handle end of the bow 10, the said strip conforming to the inner edge 14 of the throat piece and to the inner surface of the adjoining portions of the bow 10, and being securely glued thereto for purposes of reinforcement.

The handle 12 of the racket may include pieces

16 and 17 of the usual type, secured in opposite positions as shown in Fig. 2.

According to the present invention the inner portion 13a of the throat-piece 13, and the adjoining portions 10a of the bow 10 are made substantially thicker than the remaining portions of the throat-piece and bow, and the width of the crescent-shaped reinforcing strip 15 is considerable and substantially equal to the thickness of the said thicker portions, as clearly shown in Figs. 1 and 2. Also, the said thicker portions of the throat-piece and bow, which are coextensive with each other and the strip 15 are shaped to simulate arcuate reinforcing strips.

As clearly shown in Fig. 1, the thicker portions 13a and 10a extend so as to constitute a part of the oval defined by the bow 10, and at the points 10b of the bow, the thicker portions thereof gradually merge with the parallel sides 10c. Also, the crescent-shaped reinforcing strip 15 tapers in width with the taper of the bow, as indicated at 15a (Fig. 2).

All of the joints between the bow 10, throat-piece 13 and reinforcing strip 15 are strongly glued, and by virtue of the increased thicknesses of the parts as pointed out above, the area of the glued joints is considerably increased. Due in part to the greater glued areas and thicker parts, I have found that a very sturdy construction is obtained which will withstand considerable hard play without signs of failure, or even cracks in the finish which is applied to the racket. In part I also attribute this resistance to failure to a more equal distribution of the flexing which the racket undergoes under strain, such flexing occurring not only at the extensions 11 of the bow, but also throughout the portions 10a thereof.

If desired a covering or finishing medium such as an opaque lacquer 18, Fig. 3, may be applied to the thicker portions 13a and 10a of the throat-piece and bow respectively, and to the reinforcing strip 15 so as to protect and conceal the grain and joints of these parts, and to give the appearance of separate reinforcing strips on each side of the racket, such as heretofore referred to. Other covering means such as a decalcomania may be employed, either with or without ornamentation.

Where separate arcuate reinforcements have been employed in prior tennis rackets, these reinforcements have generally comprised pieces which were bent so as to provide a lengthwise grain, the pieces then being glued in place and dressed down so as to present a smooth shaped surface in the form of a broad bead. According to the present invention this operation is eliminated. In making the present improved racket, I create the thicker portions of the throat piece and bow and the reinforcing strip 15 as an incident to the usual dressing down operation employed in finishing the throat 13, bow 10 and extensions 11 thereof. I thus eliminate the costly procedure of cutting and bending separate arcuate reinforcements and gluing them in place.

The usual operation in shaping the reinforcement to conform with the curvature of the bow is then applied to the thickened portions of the bow and throat to give it the substantial identical shape and appearance of a prior racket.

The usual animal glues may be used in making the glue joints. However, where a lacquer is used as the finishing medium 18, I prefer to use resinous adhesives, which are compatible therewith between the various parts of the racket structure, for the joints, since the lacquer adheres much better thereto so that the lacquer coating does not have a tendency to crack along the joints. While this cracking of the lacquer does not affect the structure of the racket, it gives the appearance of failure, which is undesirable.



By the use of induction heating, a racket made in accordance with my invention may be economically and conveniently fabricated in a very short length of time, and through the elimination of separate arcuate reinforcements the cost of fabrication of the racket is kept down considerably.

A modification of the invention is illustrated in Fig. 4, wherein cover plates 19 are provided to cover each side of the throat-piece 13 and bow extensions 11 at the thinner portions thereof, the edges of the said plates being recessed into the thicker portions of the throat-piece and bow as shown, thus an additional reinforcement is had by covering the joints of the extensions 11 and throat-piece 13. If desired, the plates 19 may be recessed in the handle portions 16 and 17 in a similar manner.

Variations and modifications may be made within the scope of this invention and portions of the improvements may be used without others.

I claim:

1. In a tennis racket, a bow substantially oval in shape, having handle extensions; and a throat-piece between said extensions, shaped to complete the oval defined by the bow, said throat-piece and bow each having integral portions forming continuations of each other and lying in the oval, said portions being substantially thicker than the remaining portions thereof to provide increased strength thereto and being shaped to simulate arcuate reinforcing strips at the handle end of the bow.

2. In a tennis racket, a bow substantially oval in shape, having handle extensions; and a throat-piece between said extensions, shaped to complete the oval defined by the bow, and having an integral bead on each side extending so as to lie in said oval, the portions of the bow adjoining said bead on the throat-piece being thicker than the remainder of the bow, and having surfaces forming a continuation of the said beads and providing increased strength thereto, said beads and thickened portion of the bow being shaped to simulate arcuate reinforcing strips at the handle end of the bow.

3. In a tennis racket a bow substantially oval in shape, having handle extensions; a throat-piece between said extensions, shaped to complete the oval defined by the bow, said throat-piece and bow each having integral portions forming continuations of each other and substantially thicker than the remaining portions thereof, shaped to simulate arcuate reinforcing strips at the handle end of the bow, the said thicker portions lying in the said oval and increasing the strength thereof; and means covering the thicker portions of the bow and throat-piece, differentiating said portions from the said remaining portions thereof.

4. In a tennis racket, a laminated bow substantially oval in shape, having handle extensions; and a throat-piece between said extensions, shaped to complete the oval defined by the bow, said throat-piece and bow each having integral portions forming continuations of each other and substantially thicker than the remaining portions thereof, shaped to simulate arcuate reinforcing strips at the handle end of the bow, the said thicker portions lying in the said oval.

5. In a tennis racket, a bow substantially oval in shape, having handle extensions; and a throat-piece between said extensions, said throat-piece, bow and extensions being glued together and the bow and throat-piece each having portions forming a continuation of one another, substantially thicker than the remaining portions thereof and lying in the oval defined by the bow and providing a larger area of glue joint and increased strength thereto, said thicker portion being shaped to simulate arcuate reinforcing strips at the handle end of the bow.

6. In a tennis racket, a laminated wood bow substantially oval in shape, having handle extensions; a wooden throat-piece between said extensions, said throat-piece and laminations being secured together by a resinous adhesive, the throat-piece and bow each having portions forming a continuation of one another substantially thicker than the remaining portions thereof and lying in the oval defined by the bow to provide increased strength thereto, said thicker portion being shaped to simulate arcuate reinforcing strips at the handle end of the bow; and a lacquer coating on the thicker portions of the bow and throat piece and bonded to the wood and adhesive therebetween, said coating differentiating said portions from the said remaining portions.

7. In a tennis racket, a bow substantially oval in shape, having handle extensions; and a throat-piece between said extensions, shaped to complete the oval defined by the bow; and a substantially crescent-shaped reinforcing strip secured to the inner surface of the throat-piece and to the adjoining inner surfaces of the bow, said throat-piece and bow each having portions forming continuations of each other and substantially thicker than the remaining portions thereof, and said reinforcing strip being substantially as wide as the said thicker portions of the throat-piece and bow, the said strip and thicker portions lying in the said oval and being shaped to simulate arcuate reinforcing strips at each side of the handle end of the bow.

8. In a tennis racket, a bow substantially oval in shape, having handle extensions; a throat-piece between said extensions, shaped to complete the oval defined by the bow; a substantially crescent-shaped reinforcing strip secured to the inner surface of the throat-piece and to the adjoining inner surfaces of the bow, said throat-piece and bow each having portions forming continuations of each other and substantially thicker than the remaining portions thereof and said



reinforcing strip being substantially as wide as the said thicker portions of the throat-piece and bow, the said strip and thicker portions lying in the said oval and being shaped to simulate arcuate reinforcing strips at each side of the handle end of the bow; and means for concealing the joints and surface markings of the reinforcing strip and the thicker portions of the throat-piece and bow, at the sides of the racket.

9. In a tennis racket, a bow substantially oval in shape, having handle extensions; a throat-piece between said extensions, shaped to complete the oval defined by the bow, said throat-piece and bow each having portions forming continuations of each other and substantially thicker than the remaining portions thereof, shaped to simulate arcuate reinforcing strips at the handle end of the bow, the said thicker portions lying in the said oval; plates overlying the handle extension to form a handle for the racket and reinforcing plates secured to opposite sides of the thinner portions of the throat-piece and bow and bow extensions, covering the joints therebetween, the edges of said plates being recessed into the said thickened portions of the throat-piece and into the plates on the extensions.

10. In a tennis racket, a bow substantially oval in shape, having handle extensions; a throat-piece between said extensions, glued to the latter and shaped to complete the oval defined by the bow; the throat-piece and the bow having integral portions forming a continuation of each other and substantially thicker than their remaining portions and providing glue joints having increased joint areas at the handle end of the bow.

WILLIAM T. BROWN.


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## Certificate of Correction

Patent No. 2,481,075 September 6, 1949

WILLIAM T. BROWN

It is hereby certified that errors appear in the printed specification of the above numbered patent requiring correction as follows:

Column 6, line 22, strike out the words "and bow", second occurrence, and insert the same after "throat-piece" in line 25, same column;

and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 31st day of January, A. D. 1950.

[SEAL]

THOMAS F. MURPHY,
*Assistant Commissioner of Patents.*