

July 29, 1924.

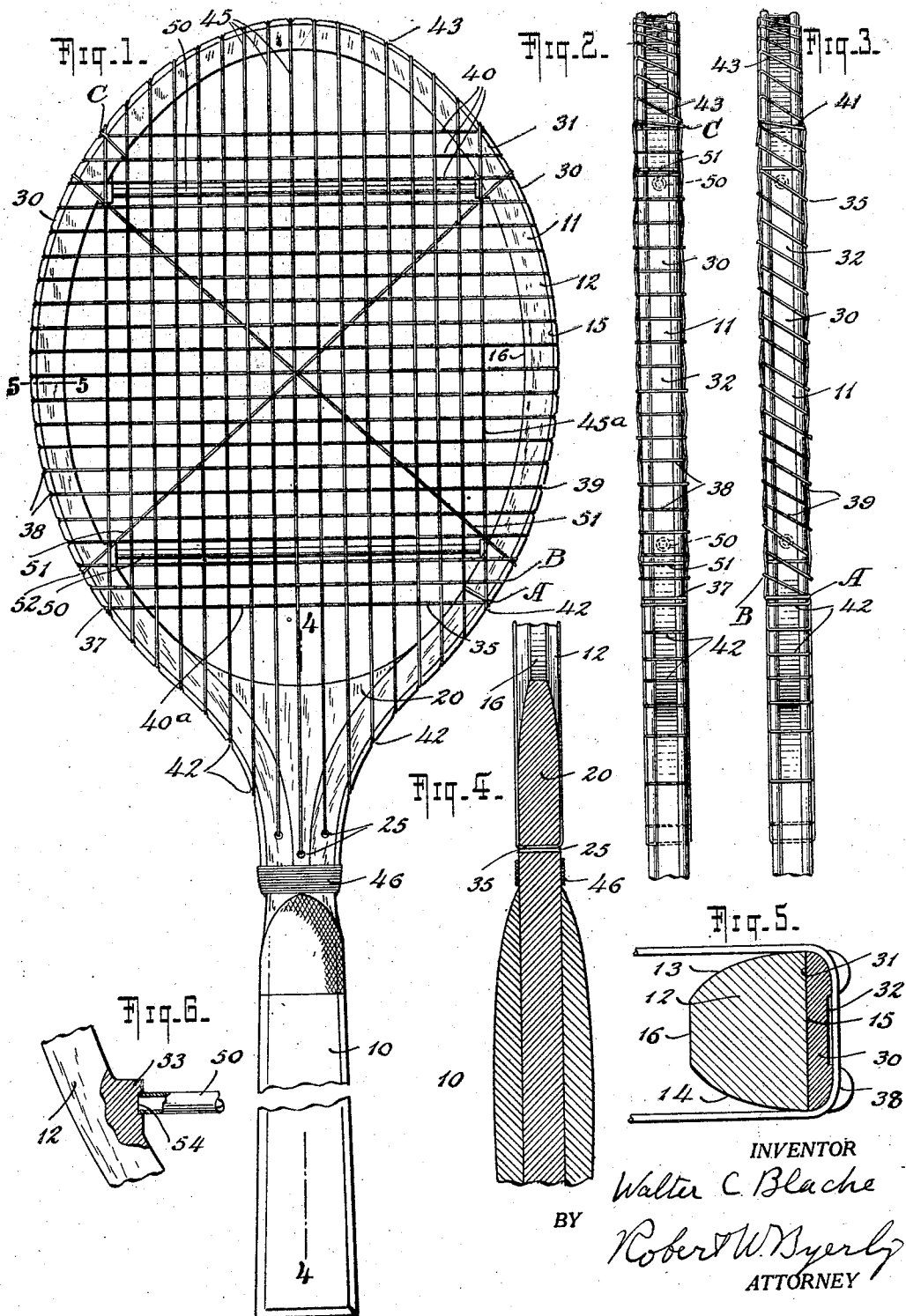
W. C. BLACHE

1,502,845

RACKET

Filed Sept. 30, 1922

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

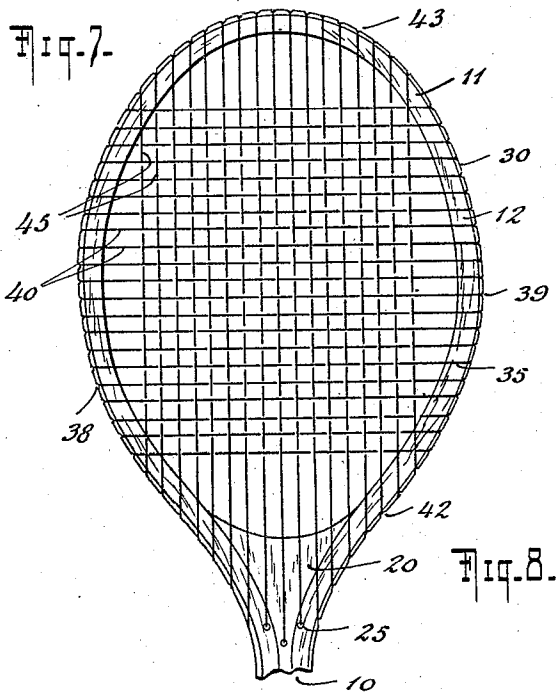


Fig. 8.

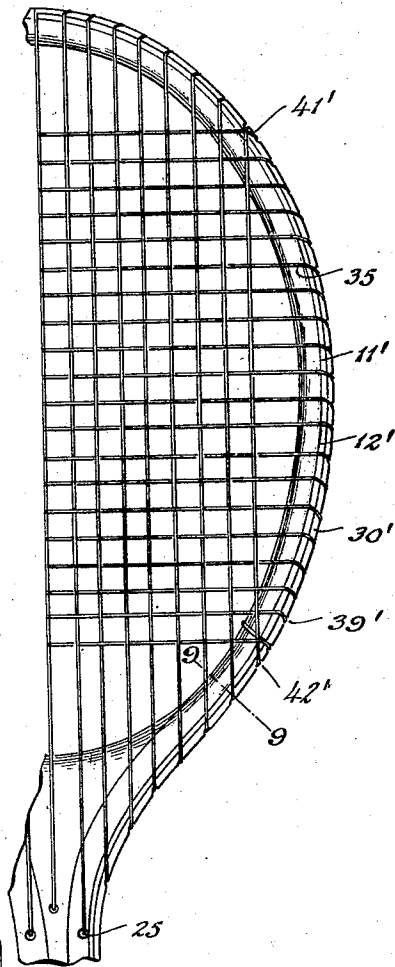


Fig. 9.

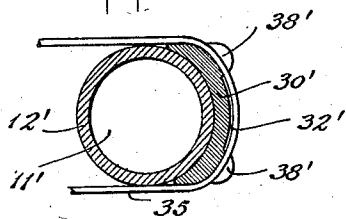
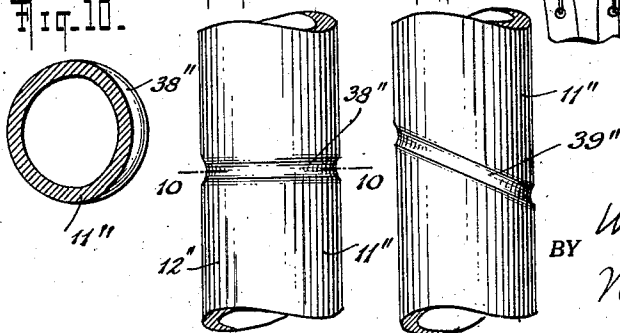


Fig. 11.

Fig. 12.

Fig. 10.



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RACKET.

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To all whom it may concern:

Be it known that I, WALTER C. BLACHE, a citizen of the United States, residing at Englewood, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in Rackets, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

10 This invention relates to rackets for playing tennis, squash, and other games, and aims to provide a racket of great strength provided with a large resilient playing surface.

15 Ordinary squash and tennis rackets are provided with a single mesh playing surface lying in the median plane of the frame of the racket. This arrangement necessitates providing a plurality of closely spaced perforations in the frame for the passage of the cord which forms the playing surface. Such perforations necessarily weaken the frame. Furthermore, in such rackets the area of the effective playing surface is materially less than the area included with the inner edge of the frame owing to the fact that the projection of the frame at each side of the playing surface prevents a ball from striking the playing surface squarely unless the ball strikes the racket at some distance inside the inner edge of the frame.

20 A racket constructed in accordance with the present invention is provided with an imperforate frame and with two mesh playing surfaces at opposite sides of the frame and formed by a cord which is wound over the frame.

25 The frame, even though made lighter than that of an ordinary racket, is nevertheless much stronger than the ordinary racket frame.

30 Since the frame of the new racket does not project beyond the outer sides of the two playing surfaces, the effective area of these surfaces is substantially equal to the area included within the outer edge of the frame, and is in consequence much greater in proportion to the size of the frame than the area of the effective playing surface of an ordinary racket.

35 A further feature of the invention consists in providing the frame with internal bracing lying in its median plane and consequently spaced from both the playing surfaces so that it does not interfere with

either of them. In this way the strength of the frame may be still further increased.

Other features and advantages of the invention are hereinafter pointed out in connection with a detailed description of a number of specific embodiments of the invention which are illustrated in the accompanying drawings, in which:—

Fig. 1 is a side view of a racket having a wooden frame strung with wire and provided with internal bracing;

Fig. 2 is an edge view of the racket shown in Fig. 1 looking from the left in Fig. 1;

Fig. 3 is an edge view of the racket shown in Fig. 1 looking from the right in Fig. 1;

Fig. 4 is a fragmentary longitudinal section on the line 4—4 of Fig. 1;

Fig. 5 is an enlarged transverse section on the line 5—5 of Fig. 1;

Fig. 6 is an enlarged fragmentary side view, partly in section, showing the mounting of the transverse braces of the racket shown in Fig. 1;

Fig. 7 is a side view of a racket having a wooden frame strung with gut;

Fig. 8 is a partial side view of a racket having a tubular metal frame and strung with metal wire;

Fig. 9 is an enlarged transverse section on the line 9—9 of Fig. 8; and

Figs. 10, 11 and 12 show a modified form of tubular metal frame, Fig. 10 being a transverse section of the frame on the line 10—10 of Fig. 11, and Figs. 11 and 12 being fragmentary edge views of opposite sides of the frame.

The racket shown in Figs. 1 to 6 is provided with an ordinary handle 10 and with an open frame 11 of ordinary shape extending from one end of the handle. The main portion of the frame 11 is formed by a wooden rim 12 which differs in cross-sectional shape from the rim of an ordinary racket in that its sides 13 and 14 curve inwardly so that the outer edge 15 of the rim 12 is wider than its inner edge 16.

At the inner end of the frame 11, the racket is provided with a throat piece 20 which is similar to that of an ordinary racket except that it tapers inwardly as best seen in Fig. 4.

The inner end of the handle 10 is provided with three transverse holes 25. These holes pass through portions of the rim 12 and the throat piece 20 which, as is usual in wooden

rackets, are extended to form part of the handle 10. It should be noted, however, that the part of the rim 12 which forms the open frame 11 is imperforate.

5 In order to position the loops of the cord which is wound over it, the frame 11 is provided at its outer edge with transverse grooves. Each of these grooves may extend continuously across the outer edge of the
10 frame or may be interrupted in the middle portion of the outer edge. The grooves may, if desired, be formed directly in the rim 12. In the form illustrated in Figs. 1 to 6, however, the grooves are formed in a metal
15 strip 30 which extends around the outer edge 15 of the rim 12 so that it forms a part of the frame 11. The inner surface 31 of the strip 30 is flat so that it fits against the outer edge 15 of the rim 12. The outer sur-
20 face of the strip 30 may contain a central longitudinal groove 32 whose purpose is to decrease the weight of the strip. The transverse grooves which extend across the outer surface of the strip 31, are, in consequence,
25 interrupted by the longitudinal groove 32. The arrangement of these transverse grooves may best be explained in connection with a description of the way in which the racket is strung.

30 In stringing the racket the strip 30 is first placed around the outer edge of the rim 12 and one end of a cord 35 is secured to the frame 11 at A. The end of the cord may be secured by passing it around the frame at
35 this point as illustrated, or other known methods of securing the end of the cord may be used. The cord 35 is then passed around the frame so as to form a transverse loop 40^a. The bite 37 of this loop lies in the
40 innermost one of a set of transverse grooves 38 formed in the portion of the strip 30 which lies at the left hand side of the frame 11. This and the other grooves 38 extend perpendicularly across the outer edge of the
45 frame so that the two reaches of the loop 40^a lie in the same transverse plane of the frame.

After forming the loop 40^a, the cord 35 is passed over the right side of the frame 11 so
50 that it lies in the innermost of a set of transverse grooves 39 which are formed in the portion of the strip 30 at the right side of the frame 12. This groove, like the other grooves 39, extends obliquely across the
55 outer edge of the frame so that the cord 35, when drawn into this groove, is brought to the side of the frame which is toward the observer in Fig. 1 at a point B, spaced outwardly from the point A. The winding of
60 the cord 35 is continued in the same manner so that the cord forms a plurality of spaced transverse loops 40 (including the loop 40^a). It will be understood that the grooves 39 are inclined in such manner as to space the
65 loops 40 evenly.

After forming the outermost loop 40 the cord 35 is passed over a groove 41 on the right hand side of the frame and is passed around one of a set of grooves 42 at the inner end of the frame to form a longitudinal
70 loop 45^a. The cord is then wound about the frame in a lengthwise direction and positioned by the grooves 42 at the inner end of the frame which extend perpendicularly across the edge of the frame and grooves 43
75 in the outer end of the frame which extend obliquely across the frame to form a plurality of spaced longitudinal loops 45 (including the loop 45^a). It should be noted, however, that in forming the three central long-
80itudinal loops the cord is passed through the transverse holes 35 instead of over grooves 42. After the longitudinal loops 45 have been formed the end of the cord is fastened to the frame at C.
85

In forming each reach of each of the longitudinal loops 45 the cord is interlaced with the transverse loops as it is passed across the frame. Each turn of the cord is drawn very tight during the winding so that when
90 the winding is completed the reaches of the loops 40 and 45 form mesh playing surfaces stretched across opposite sides of the frame 11.

It has been found that in winding on the
95 cord 35 in the manner described, the strip 30 is drawn tightly against the outer edge 15 of the rim 12 all the way around the frame. It is not necessary, therefore, to provide any means other than the cord 36
100 for fastening the strip to the rim. It is desirable, however, to secure the ends of the strip 30 to the handle 10 by means of a wrapping 46.

It has long been recognized that a racket
105 strung with wire provides a tighter and more durable playing surface than one strung with gut. It has been found, however, that a perforated wooden frame of ordinary construction has not sufficient
110 strength to permit stringing the racket with wire. The imperforate frame of the racket described, however, is of sufficient strength to permit this, and in consequence, I prefer to make the cord 35 of wire.
115

When the racket is thus strung with wire, I have found it desirable, although not absolutely essential, to stiffen the frame by means of internal bracing. In Figs. 1 and 6 I have illustrated one form of such bracing.
120 The bracing there illustrated comprises two transverse struts 50 and two diagonal stays 51. The bracing is, of course, placed in position before the cord 35 is wound about the frame. The struts 50 are preferably
125 hollow metal tubes. Seats 53 for the ends of the struts are formed on the inner edge of the frame 11. Each of the seats 53 contains a shallow hole 54. The ends of the struts are placed in these holes by
130

springing the sides of the frame outwardly to a slight extent. The stays 51, which may consist of pieces of steel wire, are secured to the frame 11 by looping their ends about the frame. Grooves 52 may be provided in the outer edge of the frame for the loops at the ends of the stays. The stays 51 and the cord 35 prevent the sides of the frame from springing outwardly so that the ends of the struts are held securely in the holes 54.

In Fig. 7 there is illustrated a racket similar to that shown in Figs. 1 to 6, except that this racket is strung with gut instead of with wire so that no internal bracing is required.

Figs. 8 and 12 illustrate the application of the invention to a racket having a metal frame. The racket shown in Figs. 8 and 9 has a frame 11' which consists of an imperforate tubular metal rim 12' of circular cross-section and a curved metal strip 30' adapted to fit over the outer edge of the tubular rim 12'. The metal strip 30' is provided with a central longitudinal groove 32', and with transverse grooves 38', 39', 41' and 42' arranged in the same manner similar to the grooves 38, 39, 41 and 42 of the strip 30 shown in Figs. 1, 2, 3 and 5. The construction of the racket shown in Figs. 8 and 9 is otherwise similar to that which has been described in connection with Figs. 1 to 6 except that no internal bracing need be provided.

In Figs. 10, 11 and 12 are shown portions of a racket frame 11'' which may be substituted for the frame 11' in the racket shown in Figs. 8 and 9. The frame 11'' consists of a tubular metal rim 12'' of circular cross-section. No edge strip is used in connection with this rim, but instead, the grooves which position the loops of the winding take the form of depressions 38'', 39'' which extend across the outer edge of the tubular rim and are arranged in a manner similar to the transverse grooves in the strips 30 and 30'.

It is apparent that the tubular frames illustrated in Figs. 8 to 12 may be made extremely light and extremely strong owing both to the fact that they are not perforated and the fact that they are circular in cross-section.

All the modifications of the invention which have been described provide effective playing surfaces of considerably greater area than that provided in an ordinary racket of the same size, because the frame does not project beyond the playing surfaces and so cannot prevent a ball from striking either playing surface squarely. Furthermore, owing to the inward taper of the rim 12, the reaches of the cord 35 are in contact with the sides of the rim only near the outer edge of the rim (see Fig. 5). It follows that the racket

shown in Figs. 1 to 6, as well as that illustrated in Fig. 7, provides resilient playing surfaces having an area substantially as great as the area included within the outer edge of the frame. In the case of tubular frame rackets illustrated in Figs. 8 to 12, the reaches of the cord lie out of contact with the inner half of the frame (see Fig. 9) so that the same advantage is obtained, although to a slightly less extent.

Although in describing specific embodiments of the invention I have referred to the materials of which I prefer to construct different parts of the rackets, I wish it clearly understood that my invention is independent of the particular materials used except in so far as the particular materials are specified in the claims which follow. Where the word "cord" is used in the specification and claims, it should be understood that I am using this term in a general sense to include one or more pieces of gut, wire or other material with which rackets may be strung.

While the shape of the frames of the rackets illustrated is that of an ordinary tennis racket, it should be understood that the invention is equally applicable to rackets for use in playing squash or other games, and that the shape of the frame may be modified in accordance with the particular use for which the racket is intended.

What is claimed is:

1. A racket having an open frame having a plurality of spaced transverse grooves in its outer edge, the grooves on one side and one end of the frame being perpendicular to the frame, and the grooves at the other side and the other end of the frame being oblique to the frame, and a cord wound about the frame and forming a plurality of spaced transverse loops and a plurality of spaced longitudinal loops positioned by said grooves.

2. A racket having an open frame comprising an imperforate tubular rim of circular cross-section, and a cord wound over the frame so as to form a set of transverse loops and a set of longitudinal loops, the frame being provided with means for positioning the loops of each set in spaced relation.

3. A racket having an open frame formed of an imperforate metal tube of circular cross-section, having a plurality of depressions extending across its outer edge, the depressions on one side and one end of the frame being perpendicular to the axis of the tube and the depressions at the other side and other end of the frame being oblique to the axis of the tube, and a cord wound about the frame and engaging said depressions.

In testimony whereof I have hereunto set my hand.

WALTER C. BLACHE,