Aug. 4, 1925. 1,548,134

E. F. GALLAUDET

TENNIS RACKET AND THE LIKE

Filed Jan. 31, 1923

Fig. 1.

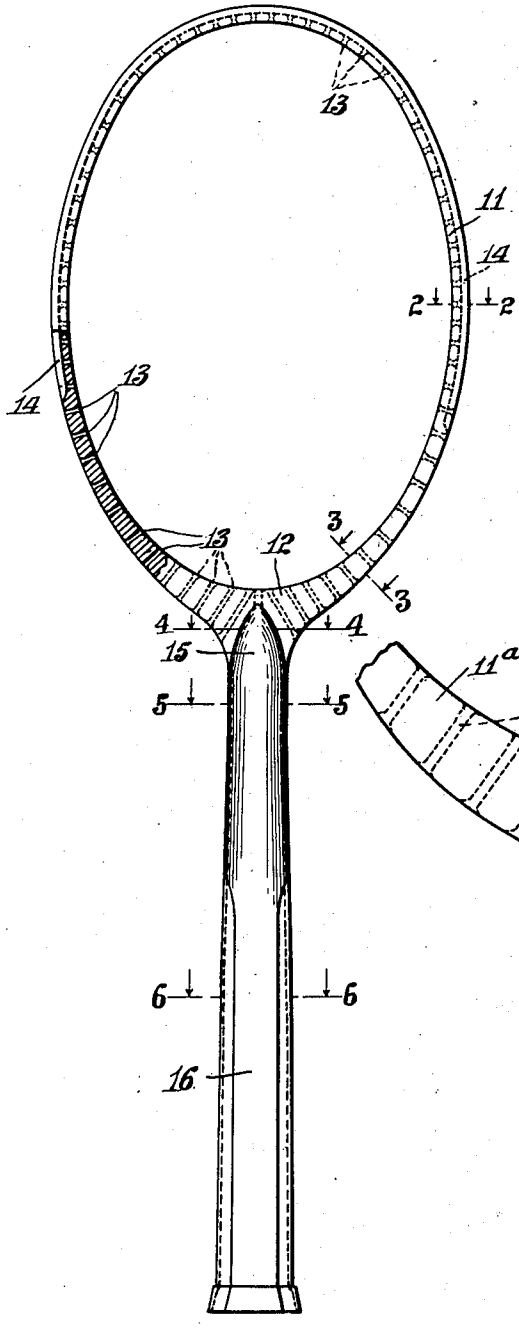


Fig. 2.

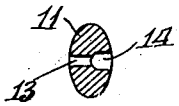


Fig. 3.

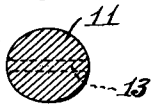


Fig. 4.

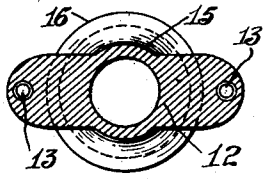


Fig. 5.

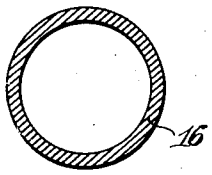


Fig. 6.

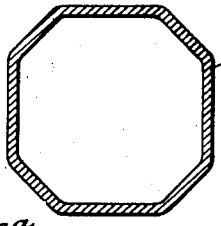


Fig. 7.

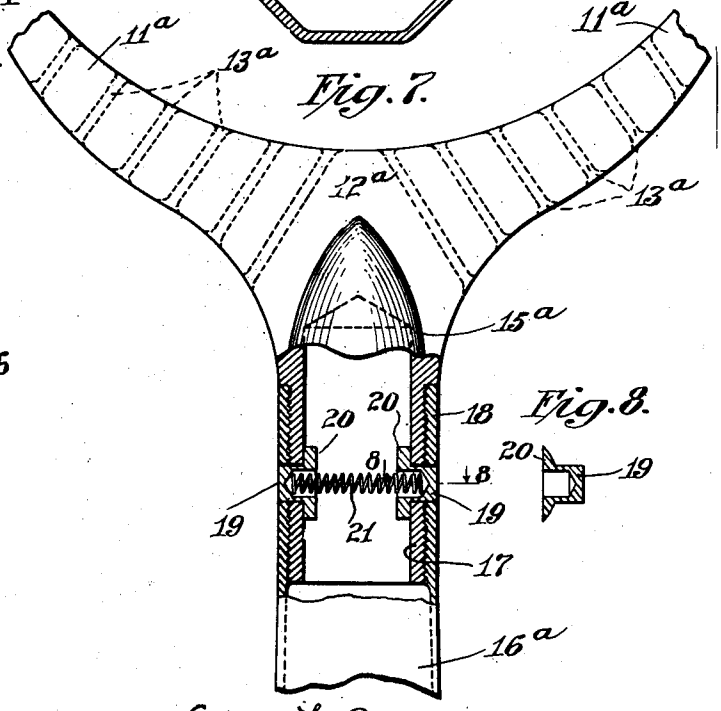


Fig. 8.

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UNITED STATES PATENT OFFICE.

EDSON F. GALLAUDET, OF NEW YORK, N. Y.

TENNIS RACKET AND THE LIKE.

Application filed January 31, 1923. Serial No. 616,025.

To all whom it may concern:

Be it known that I, EDSON F. GALLAUDET, a citizen of the United States, residing in the city of New York, borough of Manhattan, in the county and State of New York, have invented certain new and useful Improvements in Tennis Rackets and the like, of which the following is a specification.

This invention relates to tennis rackets and the like, and, specifically, to the frame of the racket.

The chief objection to the usual racket frame of wood is that the head is very liable to warp and thereby to seriously impair the playing qualities of the racket. But no satisfactory substitute therefor has as yet been found. The various metallic frames and frames of combined wood and metal which have heretofore been proposed have all developed defects of one kind or another which have prevented any general adoption thereof. The wooden frame, notwithstanding its infirmity, is the one now in almost universal use.

The object of the present invention is to provide a molded or die-formed racket frame of metal or other suitable material—bakelite, for example—which will possess the desirable, and at the same time be free from the undesirable, features of the wooden frame.

With this end in view, my new improved frame, made preferably of a suitable alloy of aluminum or magnesium, comprises, briefly stated, a head of the usual oval or other shape which has an integral jointless rim of solid section, preferably a rounded stream-line section, the two sides of which are of gradually increasing depth and sectional area as they approach the throat where they merge to bridge the throat and are thence curved outwardly to form a shank which is gradually rounded out front and back and converted from solid to hollow section, and, in the form preferred, a handle of hollow section which is formed as an integral extension of the hollow shank, thus providing a complete unitary frame. The hollow handle may, however, be made as a separate part and joined to the head, either permanently or detachably; or the handle may, if desired, be made in the usual form of wood or other material.

Such unitary frame is or may be manufactured commercially by a forming process, where the material is forced under pressure into a suitable die, in which case an aluminum alloy has been found to give satisfactory results. When, however, the head and handle are made separately I prefer, and recommend, that the head be die formed from duralumin by a drop forging process, and that the handle be drawn to shape from a tube of the same alloy.

The invention will be understood by reference to the accompanying drawings, in which—

Figure 1 is a side or plan view, partly in section, illustrating the unitary racket frame in what I now consider to be the best embodiment thereof; Figs. 2, 3, 4, 5 and 6 are enlarged sections on the lines 2—2, 3—3, 4—4, 5—5 and 6—6 of Fig. 1, respectively; Fig. 7 is an enlarged broken view, partly in plan and partly in section, illustrating a form of detachable jointure between the head and handle of a two-piece frame; and Fig. 8 is a section on the line 8—8 of Fig. 7.

Referring first to the frame shown in Figs. 1 to 6, the rim 11 of the racket head, of solid rounded section, is continuous throughout, forming at the throat an integral jointless bridge 12. Holes 13 for the stringing of the racket, which in the usual wooden frame are alternately drilled at opposite lateral angles to avoid the splitting of the rim, are drilled through the rim substantially in the central plane of the head and are rounded or reamed out at their ends so as not to cut the strings. A central longitudinal groove 14, formed in the outer surface of the rim at the two sides and extending around the outer end of the head, serves to house and thereby to protect the strings while at the same time lightening the head through that portion thereof where the least strength is required. In approaching the throat on either side the rim gradually increases in depth and, after bridging the throat in solid section, is carried outwardly on curved lines and, with a gradual rounding out of its front and rear surfaces and the gradual hollowing out of the interior, is converted into a hollow shank 15. The hollow handle 16 is formed as an integral extension of the walls of the shank, the rounded or substantially cylindrical section at the inner end being preferably con-

verted into the usual octagonal section through the outer or grip portion of the handle.

The unitary frame, constructed as described of an aluminum alloy, or of other suitable material, not only possesses great resiliency but, by the increased thickness of the walls and sectional area of the rim at and adjacent the point where the handle merges with the head and where the frame is in use subjected to the greatest stress, combines a maximum of strength with a minimum of weight.

In the two-piece frame illustrated in Figs. 7 and 8 the head is formed with a continuous jointless rim 11^a and integral hollow shank 15^a as in the single piece frame, but the shank terminates in a slightly reduced and externally threaded cylindrical end 17, upon which is screwed the interiorly threaded inner end 18 of the hollow handle 16^a. The two parts thus detachably joined are here shown as locked together by means of two short bolts 19, hollowed out at their inner ends and each provided with a head 20 curved to fit the curved inner wall of the shank, which are yieldingly held by a spring 21 within aligned openings provided for the purpose in opposite sides of the shank and handle. By pressing the bolts inwardly, the handle will be released and can be unscrewed from the head, and the bolts will spring back to locking position when, the handle being again screwed upon the shank, the holes in the two parts are brought into alignment. In case it is desired to join the handle permanently to the head, the screw threads may be omitted and the handle secured upon the shank by rivets, since it is impossible to weld the alloys of aluminum and magnesium without impairing their qualities.

It is to be understood that the racket frame may be variously modified in its several details, within the scope of the appended claims, without departing from the spirit or sacrificing the substantial advantages of the invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. A unitary jointless racket frame comprising an integral head and handle and in which the two sides of the head are of gradually increasing depth of solid section as they approach and merge into the throat and are curved outwardly to form a shank which in turn is gradually converted from a solid to a hollow section.

2. A unitary moulded racket having a die-formed head and a handle of closed hollow section which are integral and in merging one into the other provide a section of an area gradually tapering in both directions.

3. A unitary moulded racket frame comprising a head with rim of solid section grooved longitudinally in its outer surface at the two sides and around the outer end and integral therewith a handle of closed hollow section.

4. A unitary racket frame comprising a head with rim grooved longitudinally in its outer surface and integral handle of closed hollow section, the two sides of the rim being of gradually increasing depth and sectional area as they approach to bridge the throat and merge into the handle.

5. A racket frame comprising a unitary metallic head with rim the two sides of which at one end of the head gradually merge first into a throat and neck of solid section and then into a shank of hollow cylindrical section.

6. A racket frame comprising a metallic head with unitary rim and integral therewith a shank of closed hollow section, the opposite sides of the rim being of gradually increasing depth and area as they approach to bridge the throat and merge into the shank.

7. A racket frame comprising a head with unitary rim of solid section and shank of closed hollow section, the rim having a central longitudinal groove formed in its outer surface on the two sides and extending around the outer end of the head and, at the inner end of the head, after bridging the throat in solid section, being curved outwardly to form a shank which is gradually converted from a solid to a hollow section.

EDSON F. GALLAUDET.