June 8, 1926. 1,587,919

C. C. MORRISON

RACKET

Filed April 26, 1922

Fig. 1.

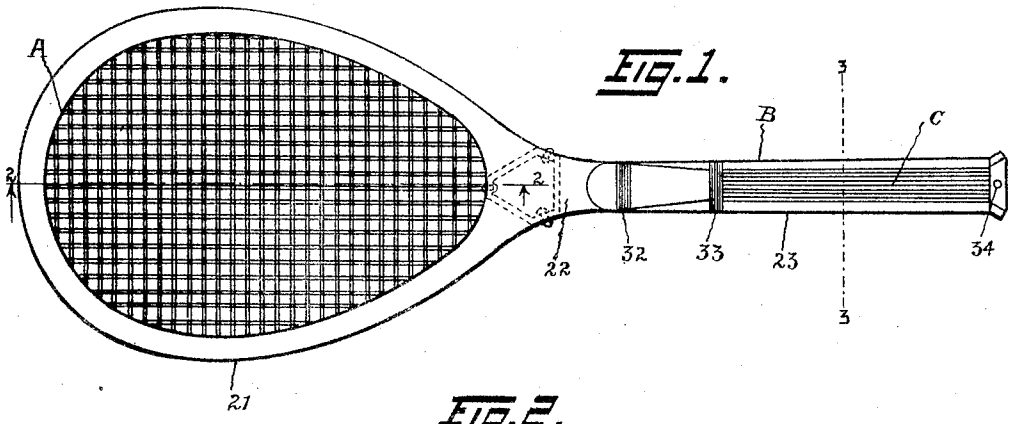


Fig. 2.

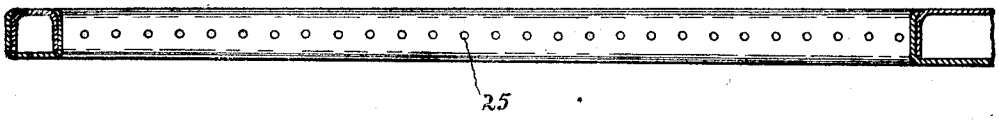


Fig. 3.

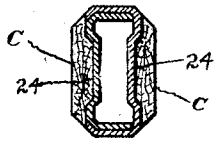


Fig. 4.

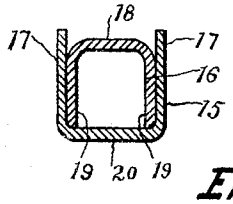


Fig. 5.

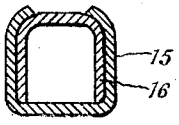


Fig. 6.

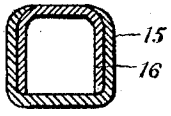


Fig. 11.

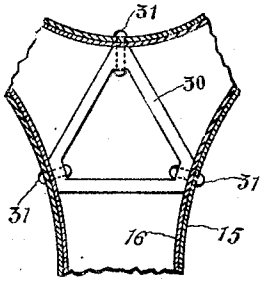


Fig. 9.

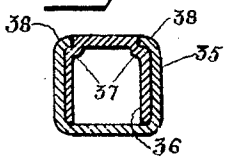


Fig. 7.

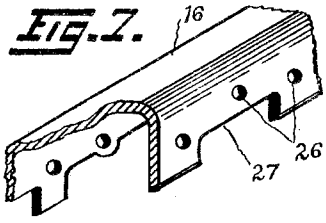


Fig. 10.

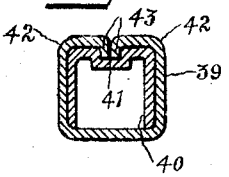
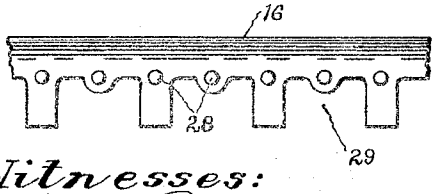


Fig. 8.



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Inventor:

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By his Atty, F. H. Richards.

Patented June 8, 1926. 1,587,919

UNITED STATES PATENT OFFICE.

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RACKET.

Application filed April 26, 1922. Serial No. 556,685.

My present invention relates to improvements in frames for tennis rackets, squash rackets and the like, and particularly relates to rackets having a hollow metal frame.

One object of my invention is to provide a hollow metal frame of shell construction for tennis rackets and the like, the frame being comprised of interlocking shell portions.

Another object is to provide a hollow metal frame of two part shell construction, for tennis rackets and the like, comprised of shell portions which interlock with each other to form a strong and rigid frame, simple in construction and cheap to manufacture.

A feature of my invention is the employment of an outer shell portion and an inner shell portion, each portion having one open side, or side on which there is no connection or attachment to the adjacent sides of the shell portion, the shell portions being invertedly interlocked the one within the other, so that a closed side or web of one shell portion provides a means for closing the open or unattached side of its co-operating shell portion, the shell portions being tightly held together by engagement with each other and forming a strong and rigid hollow frame.

Another feature is the arrangement when the shell portions are interlocked, of staggered lacing holes in the inner shell portion to register with staggered lacing holes in the outer shell portion, and the arrangement of alined lacing holes in the inner shell portion to register with alined lacing holes in the outer shell portion.

Another feature is the forming of the hollow metal frame of interlocking outer and inner shell portions, and cutting away or bridging out the inner shell portion at its lower edges for reducing the weight of the frame without impairing the strength or rigidity of the frame.

These and other objects, features and capabilities of my invention will be disclosed in the course of the following description.

In the accompanying drawings which form part of this specification, Figure 1, is a plan view of one embodiment of my invention.

Figure 2, is a side view on an enlarged scale, on the line 2—2 of Fig. 1, and partly in cross-section, of the head of the racket.

Figure 3, is a detail sectional view on the line 3—3 of Fig. 1.

Figures 4, 5 and 6, are detail cross-sectional views of the interlocking shell portions of the embodiment of my invention shown in Figs. 1, 2 and 3, showing these shell portions in stages of formation of the hollow frame.

Figure 7 is a fragmentary perspective view of the inner shell portion showing the cutting away or bridging out thereof, and the arrangement of lacing holes in the outer and inner sides thereof.

Figure 8, is a fragmentary side view of the inner shell portion showing the cutting away or bridging out thereof, and the arrangement of lacing holes in the inner side thereof.

Figures 9 and 10 are detail cross-sectional views of modified forms of interlocking outer and inner shell portions.

Figure 11 is a detail view of the racket disclosing the throat piece.

Similar reference letters or numerals denote similar parts throughout the several views.

My tennis racket frame generally is of the type of metal frame shown and described in my co-pending application Serial No. 447,679, filed Feb. 25, 1921, and comprises in its main parts the head A, and the handle B, having the grip-pieces C, and the head A and handle B being made of any suitable light weight metal, such as aluminum, and the grip-pieces C preferably being of wood.

Referring to Fig. 4 for a preliminary description of the shell portions, the frame A comprises the outer shell portion 15 and the inner shell portion 16, each of these portions being in cross-section substantially U-shaped. The outer shell portion 15 is somewhat wider and deeper than the inner shell portion 16, to receive the portion 16 tightly therein in inverted position, the ends of the sides 17 adjacent to the open sides of the outer shell portion 15 extending above the line of the closed side or web 18 of the inner shell portion 16 when the portions are interlocked as in Fig. 4, and the ends of the sides 19 adjacent to the open side of the inner shell portion 16 engaging or resting upon the closed side or web 20 of the outer shell portion 15.

Each shell portion is stamped out or pressed out of suitable metal to form a shell portion of the entire frame of the racket shown in Fig. 1; that is, each shell portion comprises an elliptical head 21, but I do not restrict myself to the shape of head shown

in Fig. 1, a throat 22, and a handle 23. The respective closed sides or webs 18 and 20 of the shell portions are of the same respective widths for the length of the head 21, these closed sides or webs being widened out to fill the increased space between the sides of the shell portions at the throat 22, and then narrowing or being of reduced width from the width at the throat and subsequently widening to meet the required width between the sides of the shell portions at the handle 23. At the handle 23 the shell portions are depressed to form oppositely disposed recesses 24, shown in Fig. 3, for receiving the grip-pieces C.

In assembling the shell portions to form the frame the inner shell portion 16 is inserted in inverted position in the outer shell portion 15, or is invertedly interlocked therewith as shown in Fig. 4, and the extending ends of the sides 17 of the outer shell portion are bent inwardly and down upon the closed side or web 18 of the inner shell portion as shown in Fig. 5, these ends of the sides 17 subsequently being rounded off as in Fig. 6, to correspond substantially to the rounded ends or edges of the outer shell portion. The open or detached side of the outer shell portion 15 is thus closed by the closed side or web 18 of the inner shell portion 16, and the open or detached side of the inner shell portion 16 is thus closed by the closed side or web 20 of the outer shell portion 15, and a light weight, strong and rigid hollow frame is provided.

Arrangement is made for lacing holes in the frame for the gut net which corresponds to the well known arrangement of lacing holes in the customary or ordinary racket frame. In the well known arrangement the lacing holes, not herein shown, in the outer side of the frame are in staggered relation to each other, and the inner lacing holes are in alinement, the same as herein shown in Fig. 2 by the holes 25. To provide for registration of the lacing holes in the outer side of the inner shell portion 16 with the customary staggered lacing holes not shown, in the outer side of the outer shell portion 15, and for registration of the lacing holes in the inner side of the inner shell portion 16 with the alined lacing holes, as 25, in the inner side of the outer shell portion 15, the lacing holes in the outer side of the inner shell portion 16 are staggered as shown by the holes 26 in Fig. 7, and for lessening the weight of the racket the edge of the outer side of the inner shell portion may be cut away, or bridged out, as at 27. For bringing the lacing holes on the inner side of the inner shell portion 16 in registration with the alined lacing holes, as 25, in the outer shell portion 15, the lacing holes in the inner side of the inner shell portion 16 may be arranged as shown by the holes 28 in Fig. 8, and for lessening the weight of the racket the edge of the inner side of the inner shell portion may be cut away, or bridged out, as at 29.

For strengthening the racket frame at the throat 22 I provide the triangular brace 30, which may be of wood or metal, preferably metal, the brace 30 at the angles being flattened and secured to the adjacent portions of the frame as by the rivets or bolts 31 passing through the brace 30 and through the outer and inner shell portions 15 and 16.

The grip-pieces C may be secured in the depressed portions 24 of the outer and inner shell portions by lashings 32 and 33 and a pin 34 passing through the grip-pieces and through the outer and inner shell portions, or the grip pieces may be secured in any other suitable manner.

In the modified form of outer and inner shell portions 35 and 36 shown in Fig. 9, the sides of the inner shell portion 36 adjacent to the closed side or web are each provided with a shoulder 37, over which the ends of the open or detached sides 38 of the outer shell portion are turned or bent, thereby locking the inner shell portion in the outer shell portion, the closed side or web of the inner shell portion closing the open or detached side of the outer shell portion, and the closed side or web of the outer shell portion closing the open or detached side of the inner shell portion.

In the modified form of outer and inner shell portions 39 and 40, shown in Fig. 10, the closed side or web of the inner shell portion is extended inwardly to provide a re-entrant recess 41 in the outer side of the closed side or web, and the ends 42 of the outer shell portion adjacent to the open or detached side of the outer shell portion are made longer than in any of the other forms and provided with inturned terminations 43 which are open or detached from each other and arranged to be brought into contact with each other and engaged in the re-entrant recess 41 when the ends 42 are turned or bent over the closed side or web of the inner shell portion 40, the closed side or web of the inner shell portion 40 closing the open or detached side of the outer shell portion 39, and the closed side or web of the outer shell portion 39 closing the open or detached side of the inner shell portion 40.

Having thus described my invention, it should be understood that there may be modifications thereof and variations therein, without departing from the spirit of the invention or exceeding the scope of the appended claims.

What I claim and desire to protect by Letters Patent is:

1. A racket having a hollow metal head of interlocking shell portions.

2. A racket having a hollow metal head

of two part shell construction comprised of substantially similar outer and inner shell portions each having an open side and opposite sides connected by a web, the outer shell portion receiving the inner shell portion in inverted position therein.

3. A racket having a hollow metal frame of outer and inner interlocking shell portions, the outer portion extending more than three quarters around each part of the inner portion.

4. A racket having a hollow metal frame of two part shell construction comprised of substantially similar outer and inner shell portions each having an open side and opposite sides connected by a web, the outer shell portion receiving the inner shell portion in inverted position therein, said opposite sides of the outer member engaging the outer faces of the web and opposite sides of the inner member.

5. A racket having a hollow metal frame of front and back interlocking shell portions, one portion entirely enclosing the other portion.

6. A racket having a hollow metal frame of two part shell construction comprised of substantially similar outer and inner shell portions each having an open side and opposite sides connected by a web; the inner shell portion being received in the outer shell portion in inverted position therein and having a longitudinal recess in the outer face of its web, the edges of the side pieces of the outer portion engaging in said recess.

7. A racket having a hollow metal frame of interlocking shell portions provided with lacing holes passing through both members.

8. A racket having a hollow metal frame of two part shell construction comprised of substantially similar outer and inner shell portions each having an open side and opposite sides connected by a web and provided with lacing holes, the outer shell portion receiving the inner shell portion in inverted position therein.

9. A racket having a hollow metal head of two part shell construction comprised of substantially similar outer and inner shell portions each having an open side and opposite sides connected by a web; the outer shell portion receiving the inner shell portion in inverted position therein, the outer sides of each portion having staggered holes, the inner sides of each portion having alined holes.

10. A racket having a hollow metal frame of interlocking shell portions hidden parts of one of the portions being cut away at parts to lighten the frame.

11. A racket having a hollow metal frame of two part shell construction comprised of substantially similar outer and inner shell portions, each having an open side and opposite sides connected by a web, the outer shell portion receiving the inner shell portion in inverted position therein, said opposite sides of the inner member being deeply notched, to lighten the frame.

12. A racket having a hollow metal throat portion, and a skeleton brace secured in said throat portion.

13. A racket having a hollow metal throat portion, and a substantially triangular skeleton brace secured in said throat portion.

14. A racket having a hollow metal throat of two part shell construction comprised of substantially similar outer and inner shell portions each having an open side and opposite sides connected by a web, the outer shell portion receiving the inner shell portion in inverted position therein, and a substantially triangular skeleton brace received in said throat in contact with the front and back walls of the throat and having its apices secured to edge walls of the throat.

15. A racket provided with a handle portion of interlocking two part shell construction, each part of the two part shell construction at the handle portion having an extended depressed web, the depressed webs of the interlocking parts forming longitudinal depressions on opposite sides of the handle portion, and grip pieces secured in said depressions.

16. A racket having a hollow metal frame of two part construction, comprising a head, throat and handle, and grip pieces for the handle; the head, throat and handle being comprised of substantially similar outer and inner shell portions; each shell portion having an open side and opposite sides connected by a web and having at the handle in the web a depression for said grip pieces; the outer shell portion being wider and deeper than the inner shell portion for receiving the inner shell portion therein, the inner shell portion being invertedly interlocked in the outer shell portion so that the web of one shell portion closes the open side of the other shell portion, and the unconnected ends of the opposite sides of the outer shell portion engaging the web of the inner shell portion for retaining the shell portions in interlocking relation.

17. A racket having a hollow metal frame of two part construction and having a head, throat and handle, comprised of substantially similar outer and inner shell portions, each shell portion having an open side and opposite sides connected by a web, the outer shell portion being wider and deeper than the inner shell portion for receiving the inner shell portion therein, the inner shell portion being invertedly interlocked in the outer shell portion so that the web of one shell portion closes the open side of the

other shell portion, and the unconnected ends of the opposite sides of the outer shell portion engaging the web of the inner shell portion for retaining the shell portions in interlocking relations, the outer shell portion being provided with staggered lacing holes on its outer side and provided on its inner side with alined lacing holes, and the inner shell portion being provided on its outer side with staggered lacing holes and provided on its inner side with alined lacing holes for registration with the staggered and alined lacing holes of the outer portion.

18. A racket having a hollow metal frame of two part construction and having a head, throat and handle, comprised of substantially similar outer and inner shell portions, each shell portion having an open side and opposite sides connected by a web, the outer shell portion being wider and deeper than the inner shell portion for receiving the inner shell portion therein, the inner shell portion being invertedly interlocked in the outer shell portion so that the web of one shell portion closes the open side of the other shell portion, and the unconnected ends of the opposite sides of the outer shell portion engaging the web of the inner shell portion for retaining the shell portions in interlocking relation; the outer shell portion being provided with staggered lacing holes on its outer side and provided on its inner side with alined lacing holes, and the inner shell portion being provided on its outer side with staggered lacing holes and provided on its inner side with alined lacing holes for registration with the staggered and alined lacing holes of the outer portion, and being bridged out on its outer and inner edges for lessening the weight of the frame.

CHARLES C. MORRISON.