

Feb. 16, 1943.

K. HETZEL

2,311,172

RACKET

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Fig. I.

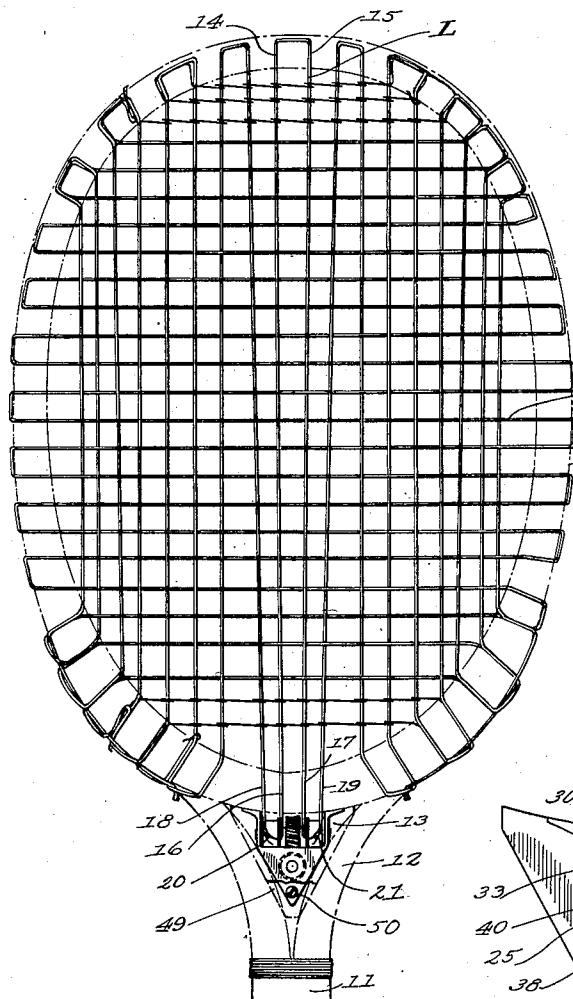


Fig. 2.

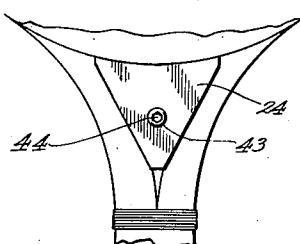


Fig. 5.

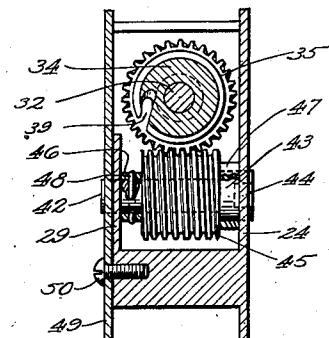


Fig. 4.

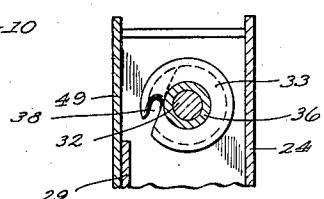
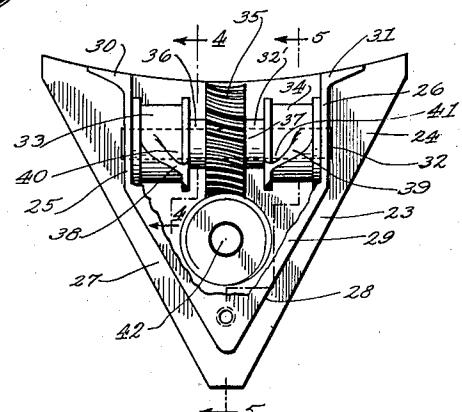


Fig. 3.



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2,311,172

RACKET

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6 Claims. (Cl. 273—73)

This invention relates to rackets and in particular to means for adjusting the tension of the stringing whereby the stringing may always be maintained at proper tension during use of the racket or slackened when the racket is not in use. An object of the invention is to provide efficient, light, and compact tension-controlling means readily associative with the stringing of a conventionally strung racket. In order that the invention may be fully understood, I shall describe it with reference to the embodiment shown by way of example in the accompanying drawing, in which:

Figure 1 is a face view of a racket equipped in accordance with the present invention.

Figure 2 is a rear view of the throat portion of the racket of Figure 1.

Figure 3 is an elevation, partly broken away, of the tension controlling mechanism.

Figure 4 is a section on line 4—4 of Figure 3, and

Figure 5 is a section on line 5—5 of Figure 3.

Referring to the drawing, reference numeral 10 designates the racket frame, and reference numeral 11 the handle joined to the frame through a throat portion 12 in which a generally triangular opening 13 is provided. The frame is conventionally strung longitudinally in that the ends of a loop L are drawn through the top central holes 14 and 15, downwardly through holes 16 and 17, and upwardly through holes 18 and 19 so that two central loops 20 and 21 at the handle end of the frame are provided. The stringing is continued up and down and outwardly in both directions and the ends anchored in the customary manner. The cross stringing C is also desirably conventional, starting with a loop at 22 and working back and forth toward the ends of the frame.

As here shown, a frame or box 23 is disposed in the opening 13, the frame comprising a triangular back plate 24 to which are joined side walls having parallel portions 25 and 26 and converging portions 27 and 28, a front wall 29 joining the side wall portions 27 and 28 so that a rigid unit, which is preferably of very light metal, is provided. The portion of the frame constituted by the side walls and front wall 29 is snugly insertable in the opening 13 so that wall 29 is substantially flush with the throat structure at one side of the racket while the side portions of wall 24 overlie the margins of the throat structure at the other side, as shown in Figure 2. The free extremities of wall portions 25 and 26 are provided with expanded foot portions 30 and 31 adapted

to bear against the bottom of the frame as shown in Figure 1.

A pin 32 has its ends journalled in wall portions 25 and 26 and has a tight fit in a sleeve 32' which extends between the said wall portions and adjacent the latter has fixed thereon drums 33 and 34. Centrally sleeve 32' has fixed thereon a worm gear 35 spaced from the drums so that additional drum portions 36 and 37 are provided by the sleeve. The adjacent edges of drums 33 and 34 are provided with inclined or undercut kerfs 38 and 39 so that overhanging lip or hook portions 40 and 41 are provided.

A pin 42 is journaled in wall portions 24 and 29 and includes an enlarged cylindrical head 43 in wall 24, the head being provided with a central socket 44 engageable by a turning tool. As shown in Figure 2, the socket is hexagonal for engagement by a complementary tool. A worm 45 on pin 42 engages worm gear 35, the worm having collar portions 46 and 47 serving to position it operatively relative to the gear. The worm is fixed to pin 42 in any suitable manner, as by a pin 48, Figure 5.

With the unit positioned in the throat as above described, and as particularly shown in Figure 1, the central loops 20 and 21 are engaged in the kerfs 38 and 39, the inner ends of the kerfs being rounded and smoothed so as to prevent any injury to the loops. With the loops engaged in original stringing as shown in Figure 1, the worm is preferably operated to wind a turn or two of the string on the drum portions 33, 34, 36 and 37 in order that the loops will not be lost when it is subsequently sought to slacken the stringing. After the loops have been caught in the kerfs, the longitudinal stringing may be completed in the customary manner as above described. To complete the assembly, a plate 49, of the same shape as wall 24, is secured to the frame 23 by means of a screw 50. The lower portion of the plate 49 is shown in full lines in Figure 1 and the remainder of its outlines in dotted lines.

When the stringing is to be tensioned, the key 45 is applied to the socket 44 and the worm is turned in a manner to drive the worm wheel 35 in a clockwise direction, Figure 5. The inner portions of the loops 20 and 21 are wound on drum portions 36 and 37 and the outer portions are wound on the drum portions 33 and 34, the latter drum portions being considerably larger, i. e., having a greater circumference than the former. This means that the outer portions of the loops are predominantly affected, this being desirable in view of the relatively long lengths of stringing

toward the sides of the frame. I have found that by the use of this specific arrangement uniform tensioning of the longitudinal stringing is obtained, the stringing sliding in the holes of the frame to the necessary extent. When considerable slack is to be taken up, it is desirable to strike the stringing during the tensioning operation in order to assist in the distribution of stresses. Tensioning of the longitudinal stringing, of course, tends to straighten it where it crosses the cross stringing and, consequently, the latter is also tensioned. Moreover, it is my opinion that the tensioning of the longitudinal stringing tends to bulge the frame somewhat laterally with consequent tensioning effect on the cross stringing. However, this may be, the tensioning operation results in uniform tautness of the strings.

Properly designed the described tension controlling unit is applicable to rackets of conventional form and adds but little weight which may be readily balanced out. While I have shown in the drawing a tennis racket assumably made of wood, the invention is, of course, not limited as to type of racket nor as to the material of which it is made, and, of course, strings of any suitable material may be used. The invention is not limited in these respects, nor as to details of structure and disposition of the tension controlling unit except as in the following claims.

I claim:

1. The combination with a racket including a frame, conventional longitudinal stringing carried by said frame, and a handle, of winding means, hook means on said winding means engaging the central loops of said stringing beyond the handle end of said frame, and means operable to adjust said winding means whereby to adjust the tension of the stringing.

2. The combination with a racket including a frame, conventional longitudinal stringing carried by said frame, and a handle, of two pairs of aligned rotary drum portions, means between each pair of said drum portions each engaging a loop of said stringing beyond the handle end of said frame, and means for rotating said drum portions and engaging means whereby to adjust the tension of said stringing.

3. The combination according to claim 2 wherein the drum portions engaging the outer portions of said loops are larger than the drum portions engaging the inner portions of said loops.

4. The combination with a racket including a frame, conventional longitudinal stringing carried by said frame, and a handle, a rotary shaft beyond the handle end of said frame having two pairs of drum portions, means between each pair of said drum portions each engaging a loop of said stringing, a worm gear fixed on said shaft, and a worm engaging said worm gear, the drum portions engaging the outer portions of said loops being larger than the drum portions engaging the inner portions of said loops.

5. The combination with a racket including a continuous frame, conventional longitudinal stringing carried by said frame, and a handle, the throat of the racket having an opening therein immediately below said frame, of a tensioning unit inserted and secured in said opening and bearing against the lower portion of said frame, said unit including a box, winding means journaled in said box and engaging the central loops of the stringing, and means carried by said box for adjusting said winding means.

6. For association with a racket including a frame, conventional longitudinal stringing carried by said frame, and a handle, the throat of the racket having a generally triangular opening therein with its apex toward the handle; a tensioning unit comprising a box having side walls which converge at one end, front and rear box portions joining said walls at said end, a shaft journaled in said side walls remote from said end, a worm wheel fixed on said shaft centrally thereof, a pair of drum portions at each side of said wheel, loop engaging means between each pair of drum portions, and a worm journaled in said front and rear box portions and engaging said wheel to drive or lock the latter, said box being insertable and securable in said opening with its convergent end fitting in the apex of said opening.

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