

[54] RACKET WITH STRING TENSION ADJUSTING MEANS

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[58] Field of Search 273/73 R, 73 C, 73 D, 73 E, 273/73 G, 73 H, 73 J, 73 K

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[57]

ABSTRACT

An improved game racket is provided, for tennis and other games, which incorporates means for adjusting the strings of the racket so that they may always be maintained at proper tension when the racket is in use, thereby obviating the need for repeated re-stringing of the racket. When the racket is not in use, the tension may be relaxed. The embodiment of the invention to be described includes a tubular frame, and a cable extending around the outer periphery of the frame. A plurality of hooks are attached to the cable, and the racket is strung so that the strings extend around the cables and beneath the hooks. The cable enters the interior of the frame at the base of the racket head and the ends of the cable extend down through the neck of the racket frame to the base of the handle. The cable ends are attached to either side of a bolt which extends through a metal plate and which is threaded through a nut. Adjustment of the nut provides the desired string tautness to the racket.

5 Claims, 9 Drawing Figures

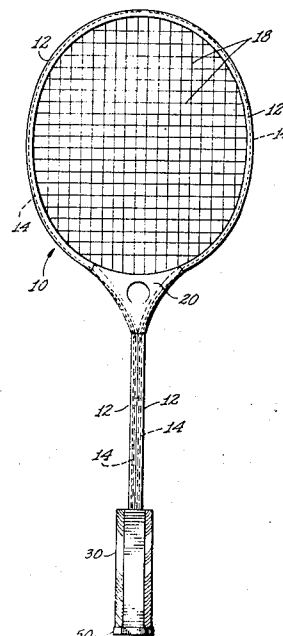
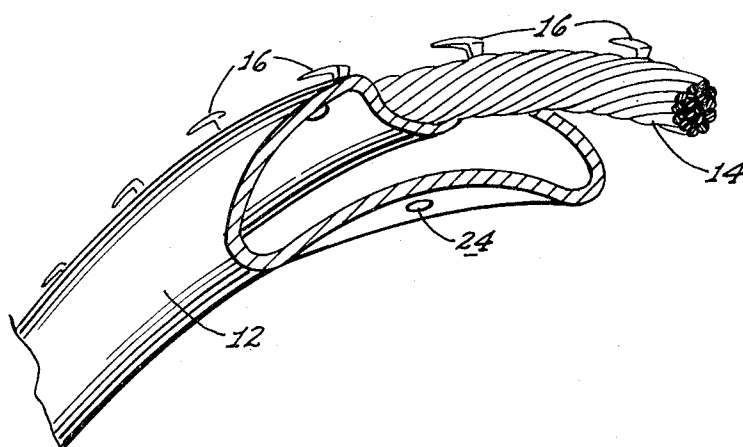


Fig. 1

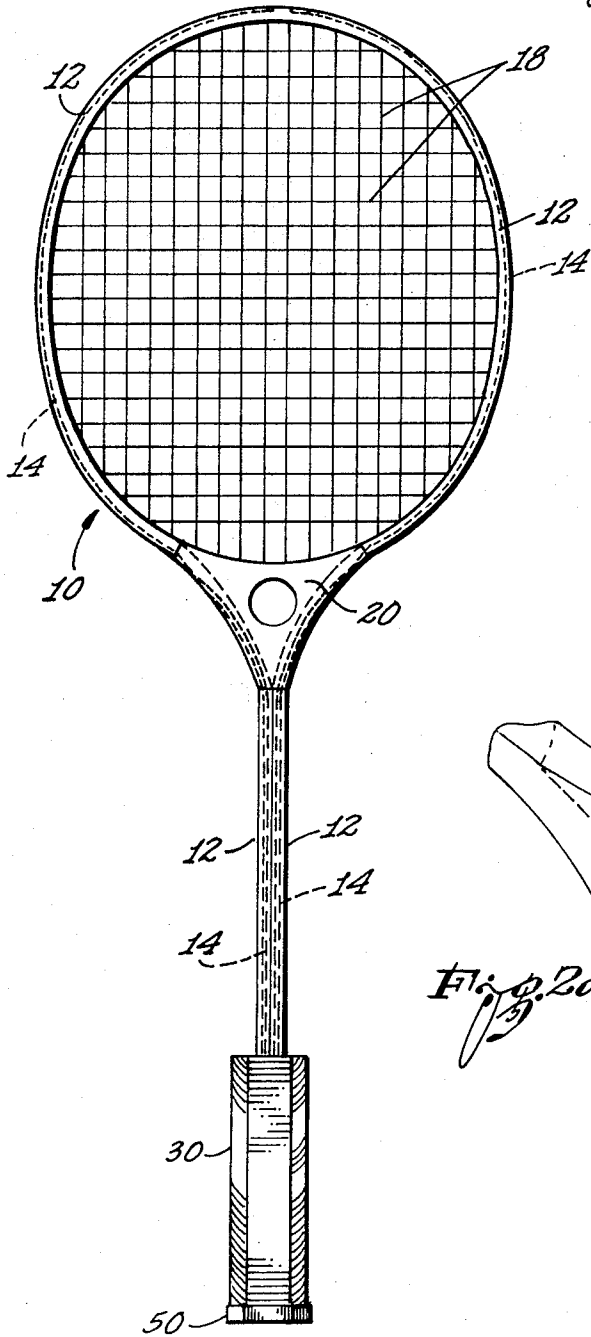


Fig. 2

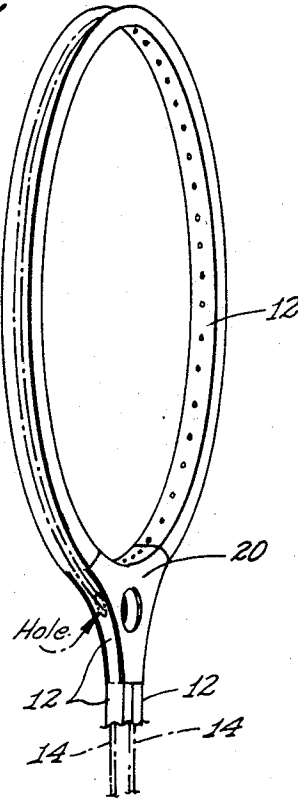
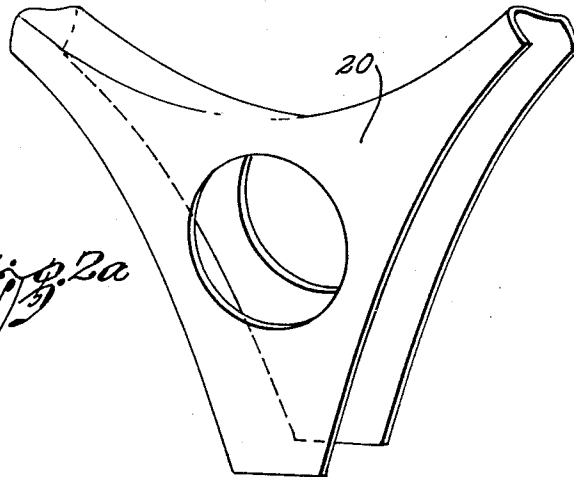
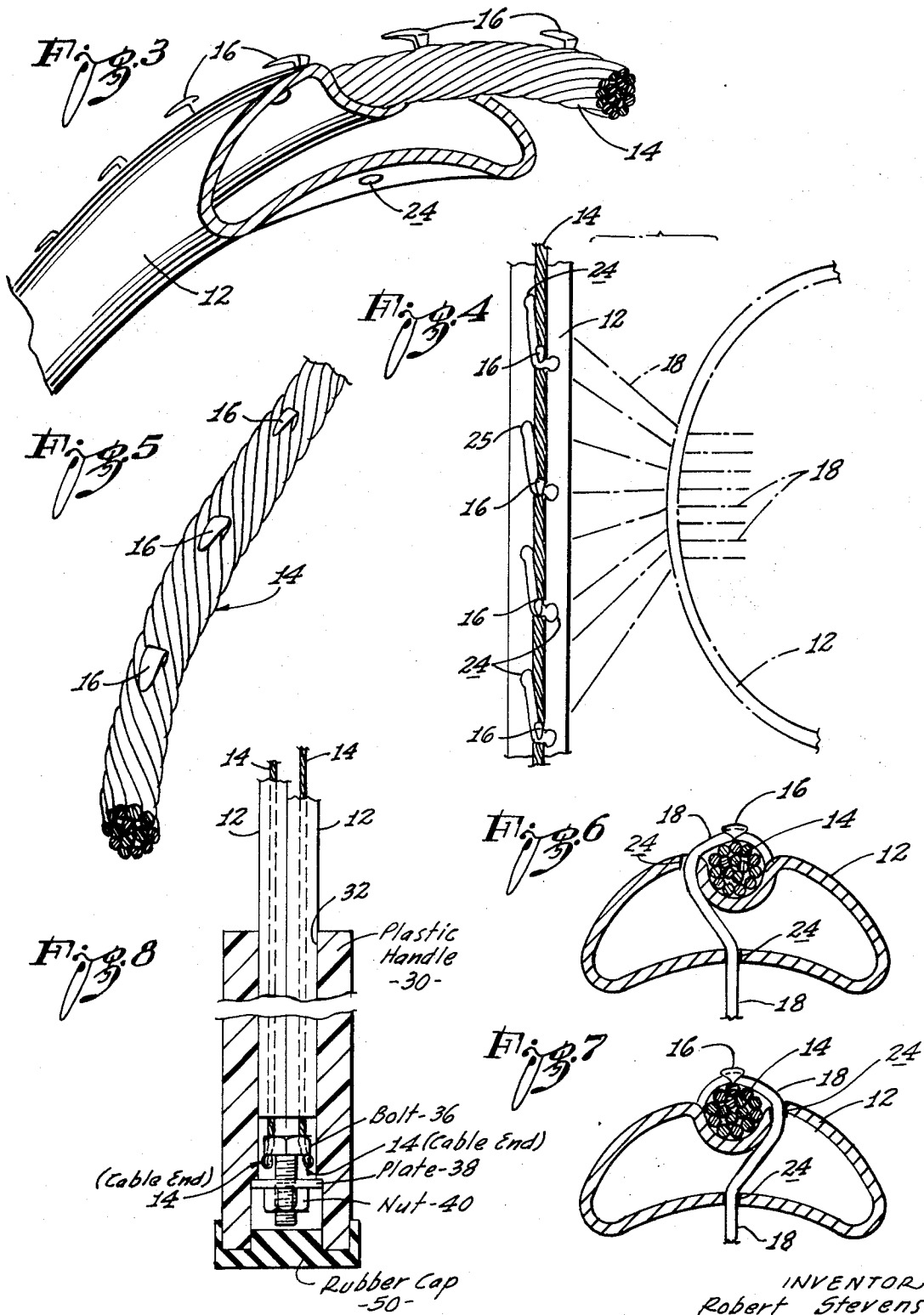


Fig. 2a



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RACKET WITH STRING TENSION ADJUSTING MEANS

BACKGROUND OF THE INVENTION

Designs for tennis rackets have been provided in the past which incorporate tension controlling means for the racket strings, so that the tension of the strings may be adjusted to maintain a certain degree of string tension during the operation of the racket. However, the prior racket designs of the aforesaid general type have proven to be relatively ineffective. This is primarily due to the fact that difficulties have been apparently evident in providing appropriate means on the racket which is effective for properly controlling the string tension. Because of the foregoing, none of those designs ever reached fabrication stage.

It is important that the string tensioning means be relatively simple in its aspect so that it does not interfere in any way with the normal use of the racket. Also, the string tensioning means must be simple to adjust, and it must operate on all the racket strings, so as to provide the desired tautness thereto and to the racket strings as a whole, with an equal distribution of said tautness over the entire face of the racket stringing.

The racket of the present invention incorporates a string tensioning means which fulfills all the foregoing criteria, and which operates with a high degree of satisfaction in controlling the string tension of the racket to any degree of tautness. The string tensioning mechanism of the invention in no way interferes with the normal operation of the racket. Also, the mechanism of the invention, as will be described, is easy and positive in its operation.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of a tennis racket which may incorporate the concepts of the invention;

FIGS. 2 and 2A are representations of the tubular frame of the racket, and the manner in which it is fabricated;

FIG. 3 is a fragmentary section of the tubular frame, and of a cable which extends around a channel in the outer peripheral surface thereof;

FIG. 4 is a schematic representation of the frame, and showing the manner in which the racket is strung;

FIG. 5 is a further fragmentary representation of the cable of FIG. 3, and showing the manner in which the hooks are attached thereto;

FIGS. 6 and 7 are sectional views of the racket frame and illustrating how the racket is strung through the frame; and

FIG. 8 is a sectional view of the handle of the racket, including an adjustable means for controlling the tension of the racket strings.

DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENT

The tennis racket designated 10 in FIG. 1, as mentioned above, may incorporate the adjustable string tension control mechanism of the present invention, and yet it conforms in all ways to conventional tennis rackets with regard to size, weight and dimensions. The purpose of the present invention is to provide a tennis racket in which the strings may be easily adjusted to the most efficient tautness thereby eliminating the need for

repeated re-stringing of the racket. The racket of the invention is constructed so that a simple adjustment is all that is required to provide any desired tautness to the strings thereof.

The particular embodiment of the racket to be described is of a tubular metal construction which permits conventional stringing. Specifically, the frame of the racket is made up of a metal tubular frame member 12 which is bent into the desired annular shape, and which is further configured to define a channel about its outer periphery.

A cable 14 (FIGS. 3 and 5) extends around the outer periphery of the frame 12, within the aforesaid channel so as to be essentially flush with the outer edge of the frame. The cable 14 is formed, for example, of appropriate metal strands, and it has a plurality of hooks 16 embedded in it. The strings 18 of the racket are strung under the hooks 16. The ends of the cable 14 extend down through the neck of the racket, as will be described, and down into the hollow interior of the handle. The cable ends are attached to an appropriate tightening mechanism, as will also be described.

As mentioned above, the tubular frame 12 in the illustrated embodiment is constructed of a one-piece metal tube, and the ends of the tube are brought together and extend down into the shaft of the handle of the tennis racket. The ends of the metal tube meet in the neck of the racket, and are held in position by a metal plate 20 (FIG. 2) which is cut, folded and welded in place, as shown. This plate serves to maintain firmly the positioning of the tubular frame 12 and to fix the attachment of the tubular frame 12 together as it forms the neck of the tennis racket.

As best shown in FIG. 3, the tubular metal frame 12 is shaped to define a channel in its outer perimeter, and the channel accommodates the cable 14, the cable having the hooks 16 embedded therein to hook the racket strings. The cable 14 may be composed, for example, of intertwined metal strands, as mentioned above. The hooks 16 on the cable are positioned and aligned with corresponding holes in the tubular frame, designated 24 in FIG. 4, the strings 18 extending through the holes 24 as the racket is strung. The strings of the racket are strung over the cable 14 and under the hooks 16, as best shown in FIGS. 6 and 7. The sectional views of FIGS. 6 and 7 illustrate two cross sections of the racket tubular frame 12 at different positions to show how the strings 18 are strung through the two surfaces of the metal frame, over the cable 14, under the hooks 16, and back down through another hole 24.

As shown in FIGS. 1 and 8, the racket includes a handle 30 whose neck extends over the ends of the tubular frame member 12, with the tubular ends extending down into a central aperture 32 in the handle. The ends of the cable 14 are attached to the head of a bolt 36. The bolt 36 is held in a plate 38 which, in turn, is held against a shoulder in the bore of the handle 30, as shown. The bolt 36 and plate 38 are shaped so that the plate cannot turn within the handle 30, and the bolt cannot turn within the plate 38. However, the bolt 36 is slidable in the plate 38, so that when a nut 40 is tightened or loosened, the bolt is caused to move longitudinally within the handle. In this way, the nut 40 may be tightened or loosened to provide any desired tension to the strings 18, without causing the cables at-

tached to the bolt to become twisted within the handle or tube cavities.

It will be appreciated that as the cable 14 is tightened, the hooks 16 draw the overlapping part of the strings 18 downwardly so as effectively to tighten all the strings. Conversely, when the nut 40 is loosened, the converse occurs, and the strings 18 are also loosened. The tension of the strings 18 maintain the bolt 36 and plate 38 securely within the handle 30 and against the aforesaid shoulder in the bore of the handle. A rubber cap 50 may be provided to fit over the lower end of the handle, as shown in FIGS. 1 and 8.

The invention provides, therefore, an improved racket for tennis, or other games, which is constructed so that the strings thereof may be repeatedly tuned to any desired tautness, and which thereby eliminates the need for repeated re-stringing. The particular mechanism of the invention constitutes a simple means for enabling all of the strings of the racket simultaneously to be tightened and loosened, and without any excessive frictional forces occurring on any of the strings, and without the need to exert any excessive force on the tightening mechanism. Also, the mechanism of the invention is constructed so that all the strings of the racket are tightened with essentially equal tension when the mechanism is adjusted.

It will be appreciated, of course, that although a particular embodiment of the invention has been shown and described, modifications may be made. It is intended in the following claims to cover all modifica-

tions which fall within the scope of the invention.

What is claimed is:

1. A game racket including: an annular frame with string holes formed therein; a cable extending around the periphery of said frame; a plurality of hooks affixed to said cable and aligned with said string holes; racket stringing means looped through said string holes and around said cable to be engaged by said hooks; and tension adjusting means for said cable for producing accurate movement of said cable with respect to the perimeter of said frame so as to cause said hooks to control the tension of said stringing means.

2. The racket defined in claim 1, in which said frame is composed of tubular metal, and in which said frame is configured to define a channel for said cable extending around the outer periphery of said frame.

3. The racket defined in claim 1, and which includes a generally hollow handle affixed to said frame, and in which the ends of said cable extend down into the bore of said handle.

4. The racket defined in claim 3, in which said adjusting means is positioned in said handle and engages the ends of said cable.

5. The racket defined in claim 4, in which said adjusting means includes a bolt attached to the ends of said cable and supported for longitudinal non-rotational movement within said handle, and which includes a nut threaded to said bolt for producing the aforesaid longitudinal movement thereof.

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