United States Patent

Wattenburg

[15] **3,693,973**

[45] **Sept. 26, 1972**

[54] TENNIS STROKE TRAINING DEVICE

[72] Inventor: **Willard Harvey Wattenburg,** 11 Idyll Court, Orinda, Calif. 94563

[22] Filed: **Aug. 20, 1970**

[21] Appl. No.: **65,536**

[52] **U.S. Cl.** .....**273/73 R, 273/29 A, 273/189 A**

[51] **Int. Cl.** **A63b 69/38**

[58] **Field of Search**.....273/29 A, 67, 73 R, 73 J, 75, 273/81, 162, 188, 189 R, 189 A; 74/551.8; 2/16, 161 A; 124/23, 24

[56] **References Cited**

UNITED STATES PATENTS

3,235,258	2/1966	Stroburg	273/189 A X
3,339,926	9/1967	Coupar	273/189 A X
3,595,583	7/1971	Oppenheimer	273/73 R X
739,450	9/1903	Schnek	273/75 X
2,189,997	2/1940	Salem	273/29 A
3,167,062	1/1965	Zeickey	124/23
3,203,697	8/1965	Berzatzy	273/75
3,423,095	1/1969	Cox	273/189 R

FOREIGN PATENTS OR APPLICATIONS

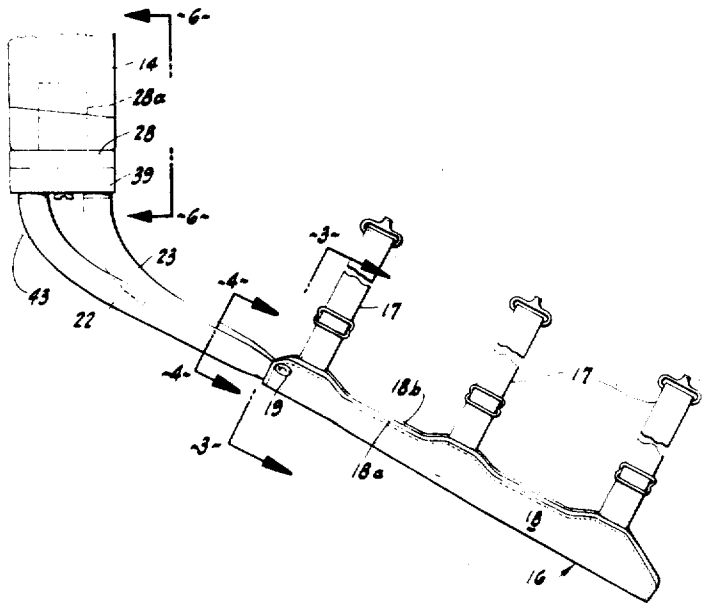
16,681	1903	Great Britain	273/75

Primary Examiner—Anton O. Oechsle
Assistant Examiner—Richard J. Apley
Attorney—Flehr, Hohbach, Test, Albritton & Herbert

[57] **ABSTRACT**

A tennis stroke training device comprising a cuff member adapted to be strapped tightly about the forearm of a player, rigid elements extending from the cuff member to a tennis racket and mounted in the base of the tennis racket in a manner to permit limited rotational movement of the racket about its longitudinal axis while maintaining fixed or rigid the angle defined between the forearm and the axis of the racket handle and lying in the plane defined by the forearm and racket handle.

11 Claims, 8 Drawing Figures



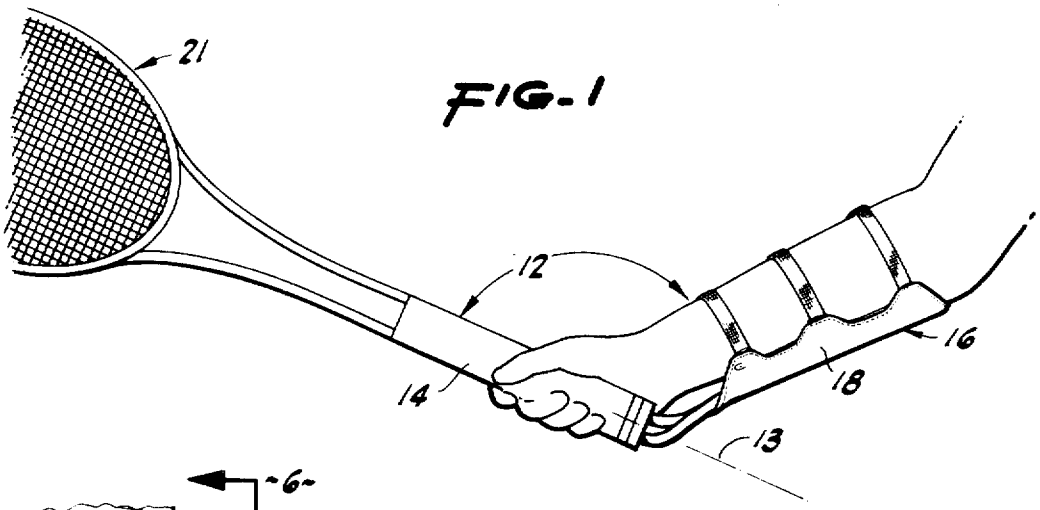


FIG. 1

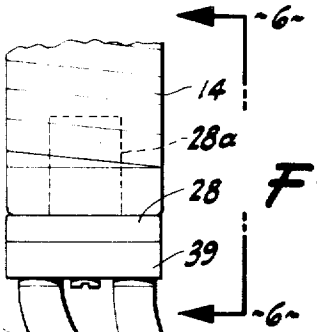


FIG. 2

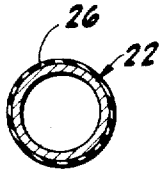


FIG. 4

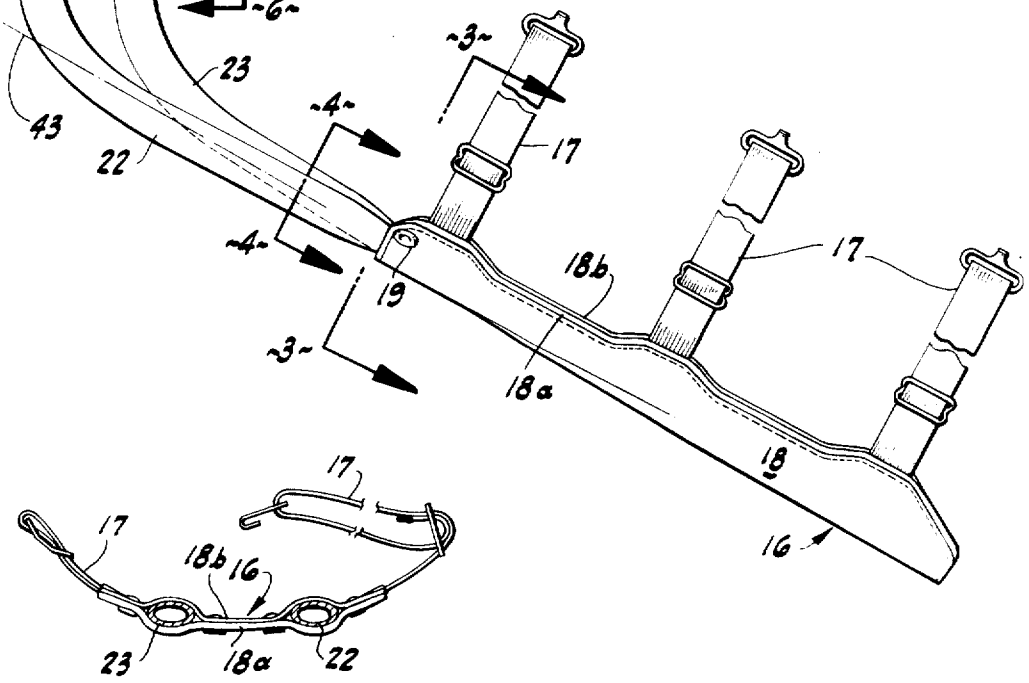


FIG. 3

INVENTOR
WILLARD H. WATTENBURG
By Fleit, Hobbach, Vest, Albritton & Herbert
ATTORNEYS

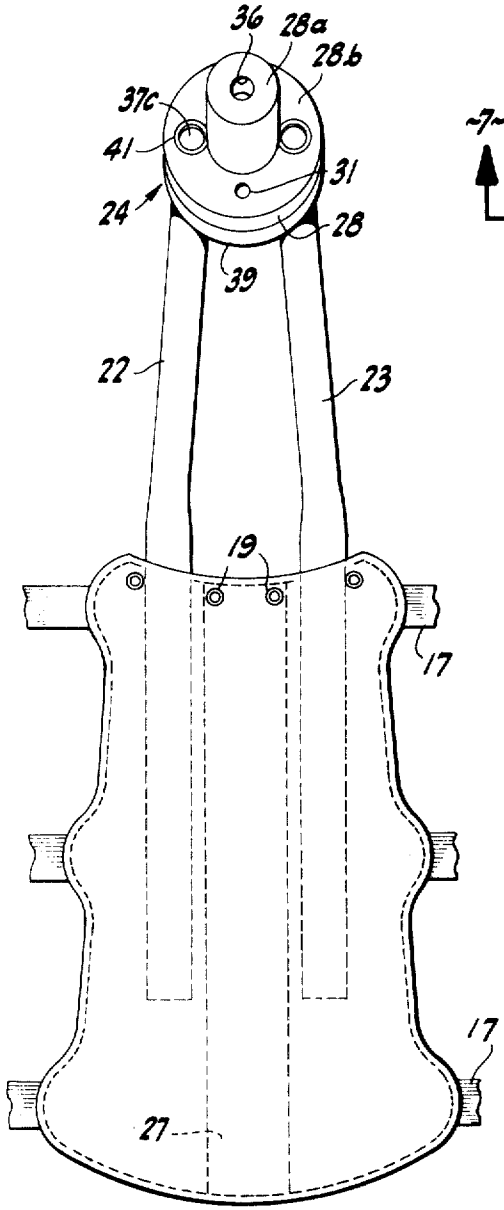


FIG. 5

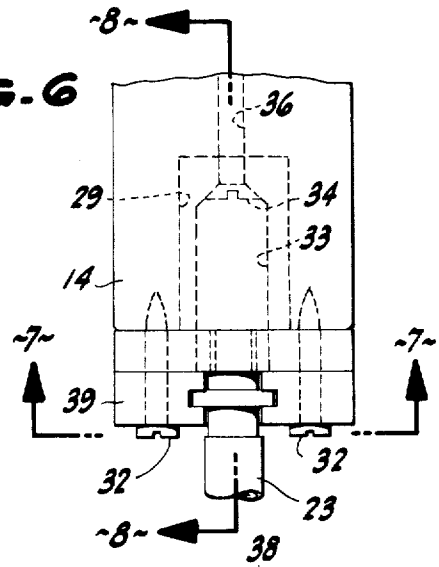


FIG. 6

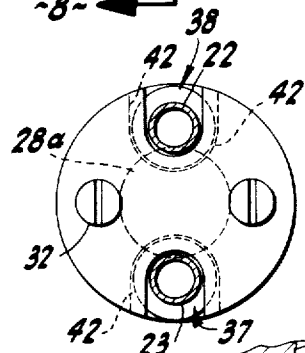


FIG. 7

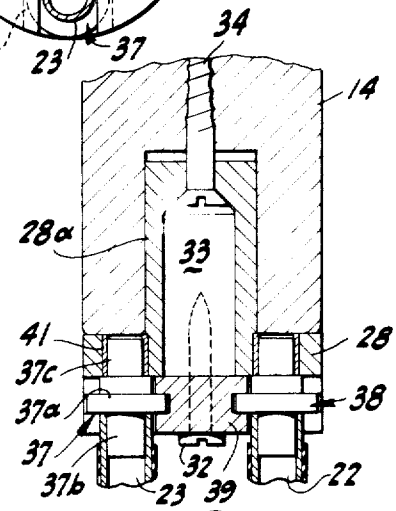


FIG. 8

INVENTOR
WILLARD H. WATTENBURG

By Fleit, Kohbach, Jacobson & Albritton & Herbert
ATTORNEYS

TENNIS STROKE TRAINING DEVICE

BACKGROUND OF THE INVENTION

This invention pertains to a tennis stroke training device of a type adapted to be worn by the player and interconnected with the tennis racket.

Proper form and control of the ball in the game of tennis requires that the player keep his wrist as rigid and straight as possible. Typically, the poorly hit ball is often the result of a weakly held racket at the time of impact. Many people are unable to master this problem and beginners typically require considerable time to develop the "stiff wrist" required for proper control of the racket.

The present invention is directed to solving the stiff wrist problem by forming a rigid bridge between the racket and the forearm of the player while permitting the racket to be rotated slightly about its longitudinal axis so as to accommodate various types of tennis strokes.

SUMMARY OF THE INVENTION AND OBJECTS

In general, there is provided a tennis stroke training device comprising a cuff member adapted to be strapped tightly about the forearm of a player. The cuff member carries extension means attached thereto and adapted to interconnect with the handle of a tennis racket in a substantially rigid angle therebetween lying in a plane defined by the racket handle and the forearm of the player. Means have been interposed between the cuff member and the tennis racket so as to enable the handle to rotate to a limited degree about its longitudinal axis.

In general, it is an object of the present invention to provide improved tennis stroke training devices.

It is another object of the invention to provide a tennis stroke training device directed to the solution of the "stiff wrist" problem outlined above.

It is a further object of the invention to provide a relatively simple structure adapted to be attached to most tennis rackets with little alteration.

The foregoing and other objects of the invention will become more readily apparent from the following detailed description of a preferred embodiment.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front elevation view showing a tennis stroke training device according to the invention in position being utilized by a player;

FIG. 2 is an elevation view in enlarged detail showing the tennis stroke training device of FIG. 1;

FIG. 3 is a section view taken along the line 3—3 of FIG. 2;

FIG. 4 is an enlarged section view taken through a single one of the tubular extension members along the line 4—4 of FIG. 2;

FIG. 5 is an enlarged plan view of the tennis stroke training device as shown in FIG. 2 with portions of the straps removed for clarity;

FIG. 6 is an enlarged detail view of a mounting assembly carried on the end of the tennis stroke training device;

FIG. 7 is a plan view, in section, as viewed from below in FIG. 6 taken along the line 7—7 thereof;

FIG. 8 is a section view taken along the line 8—8 of FIG. 6.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

A tennis stroke training device 11 or assembly, as shown in FIG. 1, insures the formation of a rigid angle 12 while permitting a limited degree of rotation of the racket 21 about the axis 13 of the tennis racket handle 14.

A cuff member 16 is adapted to be strapped tightly about the forearm of a player, as shown in FIG. 1. Thus, several adjustable straps, such as the three straps 17, are buckled about the forearm of the player. Cuff member 16 further includes a sheath portion 18 formed, typically as by means of sewing a pair of layers 18*a*, 18*b* of leather or plastic material together with stitching along their edges and by suitably reinforcing the binding between the two sheath portions 18*a*, 18*b* by means of rivets 19.

In general, extension means have been provided to be carried by cuff member 16 and adapted to rigidly interconnect handle 14 of tennis racket 21 and cuff member 16 to define a substantially fixed or rigid angle 12 in the plane defined by handle 14 of racket 21 and the forearm of the player.

This extension means comprises a pair of elongated hollow rods 22, 23 secured at one end to lie in spaced relation along a substantial portion of the length of cuff member 16 (FIG. 5) and at the other end carrying a mounting assembly 24. Rods 22, 23 are formed of a hollow tubular metal, such as aluminum, (FIG. 4) and coated with a rubberized material 26 for purposes of appearance.

Cuff member 16 includes an elongated, thin, flat stiffening strip 27 (FIG. 5) of metal embedded between the layers 18a, 18b and fastened by rivets 19.

As shown in FIG. 3, the portion of rods 22, 23 lying between layers 18*a*, 18*b* has an oval-shaped cross-section so as to lie relatively flat between the cuff's layers and extends along a substantial portion of the length of member 16 (as shown in FIG. 5 in invisible lines). In substantially way, the ends of rods 22, 23 are held in substantially fixed spaced relation embedded in the cuff member 16 and prevented from individual rotation at their mounted ends relative to member 16.

Mounting assembly 24 is adapted to be attached to the handle of a tennis racket as now to be described. Mounting assembly 24 includes a flanged insert member 28 formed to include a cylindrical insert portion 28*a* dimensioned to be received within the usual cylindrical opening 29 (FIG. 6) formed in the end of the handle of most tennis rackets made of wood.

The exterior dimension of portion 28*a* is slightly less than the standard dimension of such openings found in tennis racket handles. Member 28 includes a flange portion 28*b* formed with openings 31 for passing screws 32 therethrough and into the end of the tennis racket handle 14 (FIG. 6).

Insert portion 28*a* is formed with a generally cylindrical hollow interior 33 whereby a screw 34 can be passed through an opening 36 into additional wood in the handle.

Assembly 24 includes laterally spaced mounting bearings 37, 38 mounted for rotation within a cap or bearing plate 39.

Bearings 37, 38 serve to permit the outer end of each rod 22, 23 to rotate in mounting assembly 24 when carried by the handle of a tennis racket. Thus, as shown

best in FIGS. 7 and 8, each of the bearings 37, 38 is constructed in identical fashion and comprise, for example, an element formed with a cylindrical flange 37*a* carried about an annular body 37*b* secured, as by means of a press fit or the like, firmly within the upper hollow end of rod 23. An upper cylindrical body portion 37*c* is journalled within a bearing sleeve 41 so as to hold the upper end of rod 23 firmly while permitting rotation thereof.

Accordingly, in order to assemble the mounting assembly 24, the bearing elements 37, 38 are first inserted into the ends of rods 22, 23. Subsequently, bearing plate 39 is applied simply by sliding the flanged portions 37*a*, 38*a* into their respective annular guide slots 42 formed in bearing plate 39 (FIG. 7). Having thus inserted the ends of each of the two rods 22, 23 into bearing plate 39, the flanged insert member 28, previously attached by means of screw 34 to the end of handle 14 of a tennis racket, is aligned with the body portions 37*c* so as to slide them into the bushings 41. In order to retain the mounting assembly 24 to the lower end of handle 14, screws 32 are subsequently applied thereby holding the entire assembly together attached to handle 14.

With the device assembled as above and applied to the forearm of a player as shown in FIG. 1 for either a forehand or backhand stroke, it will be readily evident that the laterally spaced mounting bearings 37, 38 permit the outer end of each rod 22, 23 to rotate in mounting assembly 24. The rods 22, 23 are twistable about an axis of rotation 43 defined between rods 22, 23 and are limited in their twisting movement upon contact with each other thereby limiting the degree of rotation of a tennis racket handle 14 about its own axis 13 while the player is wearing the training device. This twisting movement is resisted by the stiffness of cuff member 16. In short, the two rods 22, 23 as arranged herein are permitted to be twisted about each other through a limited arc against a limited resistance but serve to preclude changing of the angle 12 formed between the forearm of the player and the axis of handle 14.

From the foregoing, it should be readily apparent that there has been provided an improved tennis stroke training device for impressing upon the player the proper angle at which to hold the racket while stroking the ball.

By virtue of the small rotational movement involved in permitting handle 14 to be rotated about its own axis, it is possible to employ the device in practicing or playing various tennis strokes, such as the forehand and backhand for example.

Thus, the present invention allows a slight rotational adjustment of the racket while switching between the forehand and backhand and other positions while continuing to provide support which prevents vertical and/or horizontal movement of the racket head with respect to the position of the forearm of the player.

I claim:

1. For use in training (device for use by) a player (in stroking with) the combination of a (tennis) racket having a handle, comprising a cuff member including means for strapping the same around at least a portion of the forearm of a player and extension means interconnecting the handle of the tennis racket and said cuff member to rigidly hold said handle and cuff member in a predetermined angular relationship lying in a plane defined by the forearm and racket handle, said extension means including means for permitting (to afford) twisting of said handle within a predetermined angle of rotation about an axis extending the length of said handle so that the player can move said racket through the limited extent required for changing from backhand position to forehand position.

2. A training device as in claim 1, in which said extension means includes a pair of elongated, rigid rods having first ends secured to said cuff member and second ends extending therefrom generally in the direction of length of said forearm, and said means for permitting (to afford) the twisting of the handle includes a mounting assembly attached to the end of the handle and bearing means housed in said mounting assembly to rotatably couple the second ends of said rods with the handle.

3. A training device as in claim 2, in which said rods are disposed in substantially parallel, laterally spaced-apart relationship in the vicinity of said cuff member, and are curved intermediate said first and second ends (with said second ends thereof formed into bight portions adjacent said bearing means) to define said predetermined angular relationship.

4. A training device as in claim 2, in which said rods are laterally spaced apart a predetermined dimension to cause contact between the rods at the extreme limits of twisting of the handle to define said predetermined angle of rotation.

5. A training device as in claim 2, in which said bearing means includes a pair of (diametrically disposed) bearings carried in (on) said mounting assembly (handle), each of said bearings being laterally displaced from the longitudinal axis of said handle and couple with a second end of a respective rod for relative rotation therewith as said handle is rotated about its axis. (about an axis extending longitudinally of said handle.)

6. A training device as in claim 2, in which said cuff means includes means cooperating with the first ends of said rods to yieldably resist twisting of said rods about their longitudinal axis.

7. A training device as in claim 6, in which said rods are laterally spaced apart a predetermined dimension to cause contact between said rods at the extreme limits of twisting of the handle to define said predetermined angle or rotation.

8. For use in training a tennis player, the combination of a tennis racket having a handle, a cuff member adapted to be strapped about at least a portion of the forearm of said player, and extension means interconnecting said handle and cuff means to rigidly hold the same in a predetermined angular relationship lying in a plane defined by said forearm and handle, said extension means including means to afford twisting of said handle within a predetermined angle of rotation about an axis extending the length of said handle.

9. A training device for use by a player in stroking with a racket having a handle comprising, a cuff member including means for strapping the same around the forearm of a player, extension means including a pair of elongated rigid rods having first ends secured to cuff member and second ends extending therefrom generally in the direction of the length of said forearm, and a mounting assembly adapted to be

rigidly attached to the end of the handle and including bearing means housed in said mounting assembly and attached to second ends of said rods to rotatably couple the second ends thereof within said mounting assembly, said rods being curved intermediate their first and second ends to define a predetermined angular relationship between said cuff member and said mounting assembly, which determines the angular relationship between the players arm and the handle, said rods being laterally spaced apart at predetermined dimension to cause contact between the rods at the extreme limits of twisting of the mounting assembly to thereby define a predetermined angle of rotation so that the player can move said racket from backhand position to forehand position.

10. A training device for use by a player in stoking with a racket having a handle comprising, a cuff member including means for strapping the same around the forearm of a player, extension means including a pair of elongated rigid rods having first ends secured to cuff member and second ends extending therefrom generally in the direction of the length of said forearm, and a mounting assembly adapted to be rigidly attached to the end of the handle and including bearing means housed in said mounting assembly and attached to second ends of said rods rotatably couple the second ends thereof within said mounting assembly, said bearing means including a pair of bearings carried in said mounting assembly, each of said bearings being laterally displaced from the longitudinal axis of said handle and coupled with a second end of a respective rod for relative rotation therewith as said handle is rotated about its axis, said rods being curved intermediate their first and second ends to define the predetermined angular relationship between said cuff member and said mounting assembly, which determines the angular relationship between the player's arm and the handle.

11. A training device as in claim **10**, in which said rods are laterally spaced apart a predetermined dimension to cause contact between said rods at the extreme limits of twisting of the handle to define said predetermined angle of rotation.

* * * * *