

[54] **RACKET**
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[51] Int. Cl.² **A63B 51/02**
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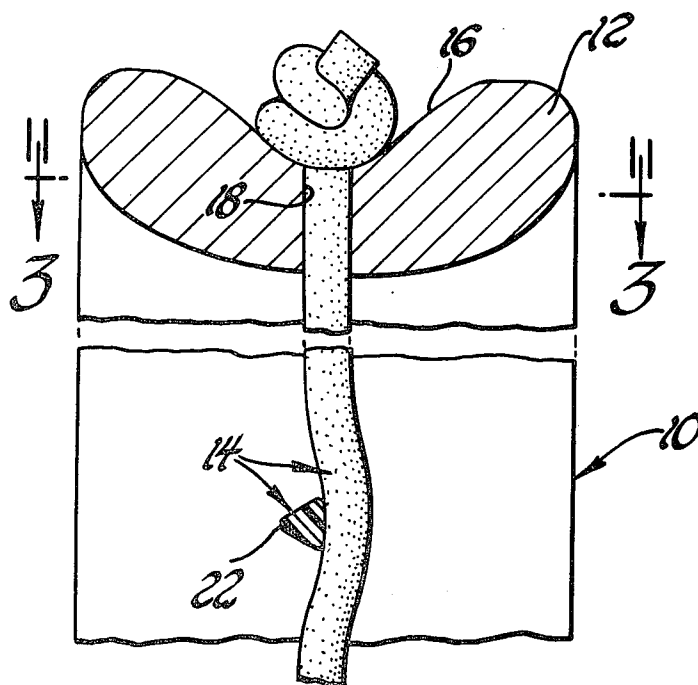
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[57] **ABSTRACT**
A racket having a pair of stringed ball-engaging surfaces wherein one of said surfaces is "smooth" while the other surface is "rough" whereby different amounts of spin may be imparted to a ball depending on which racket surface is presented to the ball.

9 Claims, 6 Drawing Figures



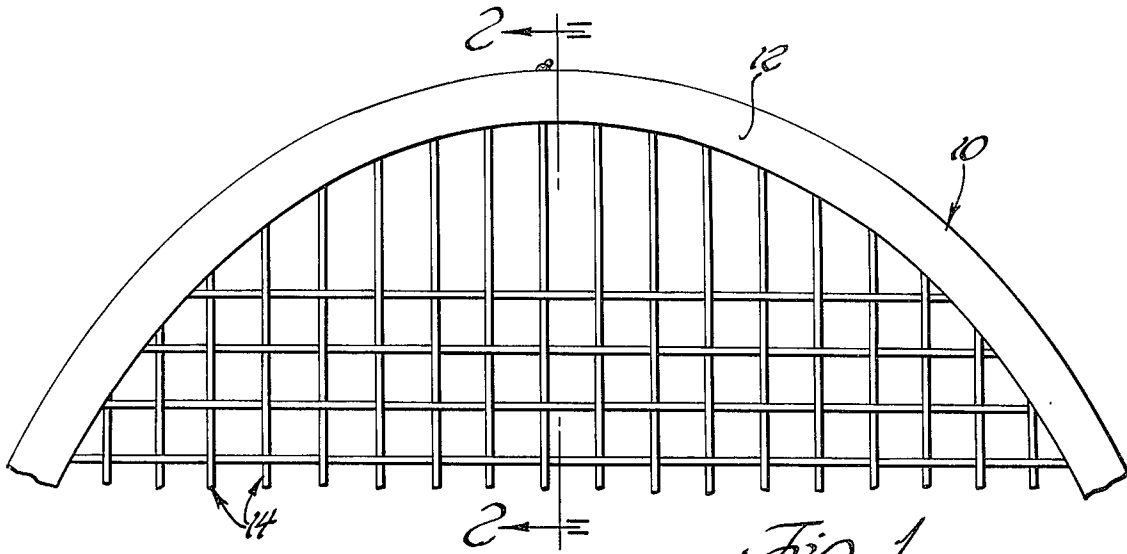


Fig. 1

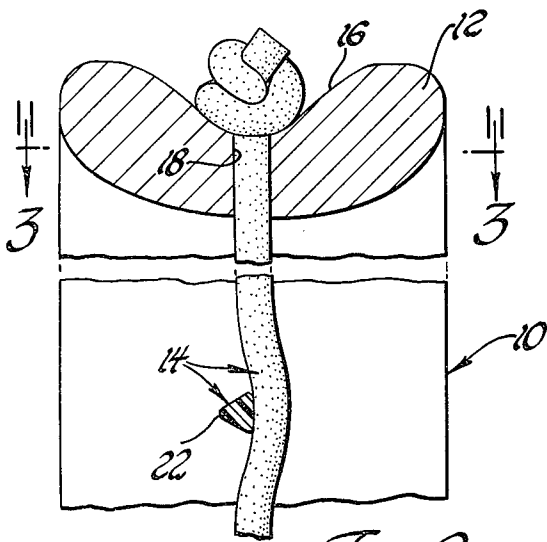


Fig. 2

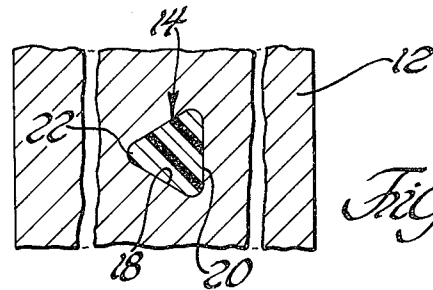


Fig. 3

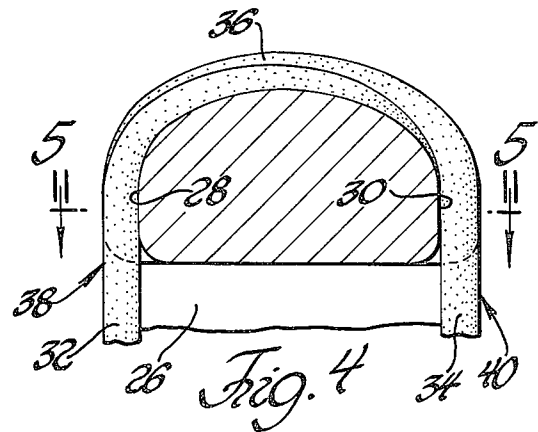


Fig. 4

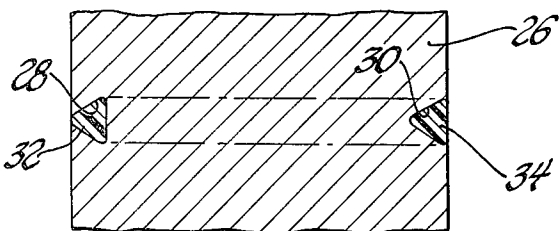


Fig. 5

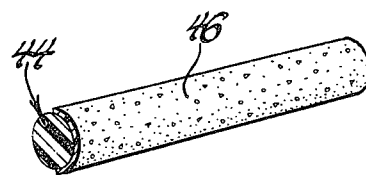


Fig. 6

RACKET

BACKGROUND OF THE INVENTION

1. Field of the Invention

In games using a racket to strike a ball, part of the technique of play normally involves certain shots wherein it is desired to impart a controlled spin to the ball both to change its flight pattern as well as bouncing characteristics. In other words, it is common to impart top spin or underspin depending on the type of shot the player is seeking to execute. For example, it is normal when a player is making his second serve in tennis, to strike the ball more softly than a first serve but at the same time imparting extra spin to the ball to cause the same to have an accentuated hop toward or away from the receiving player, making the same more difficult to return. On other occasions, when the opposing player is deep in his back court, it is common to provide an underspin to the volley, causing the ball to tend to stop or slow down close to the net and achieving what is known as a "drop shot".

Thus, being able to control the amount and direction of spin imparted to the ball is an important part of playing strategy in all racket games.

A player varies the spin by the manner in which racket contact is made with the ball. The maximum speed and minimum spin is imparted to a ball when the racket face is approximately at 90° to the flight of the ball at the time of impact. On the other hand, maximum spin is imparted when the racket face has a significant amount of tangential movement relative to the ball at the time of impact. Since both racket faces are normally of relatively the same smoothness, varying the amount of spin imparted to the ball requires excellent racket control by the player.

2. Description of the Prior Art

Insofar as the present invention is concerned, no prior art devices are known wherein the racket string surfaces are constructed in such a manner that one surface is actually formed or otherwise treated so as to be "rougher" than the other so as to facilitate or significantly change the amount of spin imparted to the ball depending on which side of the racket makes impact with the ball.

SUMMARY OF THE INVENTION

In the present invention a racket is provided wherein the string surfaces constituting one of the racket faces is of such a character as to impart substantially more spin to the ball than would be possible with a similar stroke on the opposite face. The essence of the present invention is to provide two racket faces, one of which is substantially rougher than the other face, thereby enabling the player to hit the ball with far more spin with one face than the other.

The intended result is achieved by forming or otherwise treating the racket strings in such a way that one face of the racket has a substantially greater coefficient of friction than the other. While the rougher face is visible to the eye, it is more readily determinable to the player by brushing his free hand across one of the racket string faces.

In the present invention the desired result is illustrated in basically two different ways. In one variation of the invention, the string element itself is preformed with such a cross-sectional configuration that one side of the string has a relatively flat smooth surface

whereas the opposite portion of the string has a relatively narrow or sharp surface. In this case, the racket frame includes string receiving grooves or holes having cross sections identical in shape and size to the formed string whereby the flat portions thereof are presented on one face of the racket and the sharp portions on the other face.

In another variation of the invention the string element is of conventional shape, e.g. generally circular in cross section, with one face having an abrasive or particulate material applied thereto so as to create a relatively "rough" surface as compared with the other portion of the string element which is untreated.

Referring now to the invention as depicted in the drawings:

FIG. 1 is a partial elevational view of a racket head embodying the invention;

FIG. 2 is a sectional view along lines 2—2 of FIG. 1;

FIG. 3 is a sectional view through the racket frame along lines 3—3 of FIG. 2;

FIG. 4 is an elevational section through a part of a racket frame showing another modification of the invention;

FIG. 5 is a sectional view through the racket frame along lines 5—5 of FIG. 4; and

FIG. 6 is a further modification of the invention.

As seen in FIG. 1, a tennis racket is indicated generally at 10 and includes a frame member 12 and a plurality of interwoven string elements indicated generally at 14 strung in a taut conduction across the frame.

In the modification of FIGS. 1 through 3, the racket frame includes an annular recessed portion 16 having a plurality of holes 18 formed in the median plane of the racket and adapted to receive string elements 14. Referring particularly to FIGS. 2 and 3, each string element is extruded or otherwise formed to have a generally triangular cross section and including a flat side 20 and an oppositely disposed apex 22. The string receiving holes 18 in frame 12 are likewise formed with a triangular cross section of a size and shape corresponding to that of the string elements. The frame holes are all oriented in the same direction so that the flat faces 20 of the string elements constitute one racket face while the apices 22 constitute the opposite face of the racket.

Since all of the frame holes are oriented in the same direction, it is apparent that the flat portions 20 of the string elements constitute a "smooth" surface while the oppositely facing apices constitute a "rough" surface.

Another variation of the invention utilizing the triangular cross section type string is shown in FIGS. 4 and 5. In this case the racket frame 26 includes triangularly shaped grooves or slots 28 and 30 formed in the opposite or side faces thereof which are adapted to receive correspondingly shaped string elements having lengths 32 and 34 and connecting portion 36. In this case, however, the frame grooves are formed so as to provide two sets of interwoven string elements or faces indicated generally at 38 and 40. Racket face 40 comprises the flat portions of the string elements which face outwardly in one direction while the other racket face 38 comprises the apices which face outwardly in the opposite direction. In order to achieve this relationship, the transverse common portion 36 of each string element, which is wrapped about face element 26, is twisted whereby the outwardly facing apices of racket face 38 are rotated 180° to become inwardly facing in racket face 40.

With respect to the modifications of FIGS. 1 through 5, the designations of "smooth" and "rough" surfaces refers respectively to the entire side or surface comprised of the string portions 20 or 40 ("smooth") and 22 or 38 ("rough"). For example, the greater coefficient of friction of the surface comprised of string portions 22 relative to the surface comprised of portions 20 is due to apices or relatively sharp edges which in contacting a ball relatively tangentially impart a far greater spin thereto than when similarly engaged by the "smooth" surface by string portions 20.

As an alternative to the triangularly shaped string elements of FIGS. 1 through 5, it is possible to treat a conventional type racket string in the manner illustrated in FIG. 6. In this case, string element 44 is of conventional construction, e.g. substantially circular in cross section. In this modification the racket is strung in the conventional manner before any treatment of a string surface is undertaken. However, after the racket is strung one surface of the racket is treated so as to be rougher, or so as to have a greater coefficient of friction than the other face. One manner of achieving this result is to mask the face which is to remain smooth while applying an abrasive or gritty material 46 to the other face of the racket. This result can be achieved by applying a suitable adhesive or bonding substance to the unmasked portions of the springs and thereafter sprinkling or otherwise applying the abrasive or gritty material to the adhesive. The bonding material should be of a type as to remain flexible so as not to crack or flake off as the strings flex during play.

After the gritty material is suitably bonded or adhered to the exposed portion of each string element and the masking material removed from the oppositely facing portions of the string elements, there results a racket having oppositely facing smooth and rough faces.

It is also within the scope of the invention to mechanically treat or form the strings of one face of the racket after the racket is strung to give said face a greater coefficient of friction than the other face. This can be done by utilizing a suitable tool to impress indentations or serrations in the strings of one face to create the desired roughness or coefficient of friction.

Thus, it is within the contemplation of the subject invention that other means may be utilized to create a racket having two ball-striking surfaces in which one surface has a substantially greater "roughness" or coefficient of friction than the other face to thereby enable a player to impart greatly different spins to a ball depending on which face is used to strike the ball during play.

The embodiments of the present invention in which an exclusive property or privilege is claimed are defined as follows:

1. A racket including a frame and a plurality of string elements supported upon said frame in a taut open weave pattern, each string element including first and second discrete portions extending substantially throughout the length thereof, the first discrete portions of said string elements coacting to form a first ball-engaging surface, the second discrete portions of said string elements coacting to form a second ball-engaging surface, said first ball-engaging surface having a high coefficient of friction relative to said second ball-engaging surface.

2. A racket as set forth in claim 1 in which each string element is preformed to provide said first and second discrete portions.

3. A racket as set forth in claim 2 in which the string elements have a generally triangular cross section, one side of said string element comprising said second discrete portion, the apex opposite the said one side of said string element comprising said first discrete portion.

4. A racket as set forth in claim 3 in which said frame includes a plurality of triangularly shaped openings formed therein and corresponding in shape and size to the triangular cross section of said string elements, each string element being supported between a pair of aligned frame openings.

5. A racket as set forth in claim 4 in which said frame includes a median plane intersecting said triangularly shaped openings.

6. A racket as set forth in claim 3 in which said frame includes a median plane, first and second sets of aligned triangularly shaped openings formed in said frame and disposed on opposite sides of said median plane, said openings corresponding in size and shape to the triangular cross sections of said string elements, each string element being supported between aligned openings of said first and second sets of frame openings whereby the first and second ball-engaging surfaces are respectively spaced on opposite sides of said median plane.

7. A racket as set forth in claim 1 in which each string element has a generally circular cross section, the first and second discrete portions of each string element comprehending substantially one-half of the string circumference.

8. A racket as set forth in claim 7 in which the first discrete portion of each string element has a substantially greater coefficient of friction than the second discrete portion.

9. A racket as set forth in claim 7 in which a particulate material is adhered to the first discrete portion of each string element.

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