



Madeline Hauptman

Madeline Hauptman is president of PowerAngle, maker of diagonally-strung tennis rackets.

Pairing the angles

Barbara Wolter
The Journal News

An old-fashioned snowshoe on the wall of her room inspired Madeline Hauptman to develop ways to diagonally string tennis rackets. Hauptman was seeking a master's degree in math education at the University of Pennsylvania. When she wasn't studying she would paint or play tennis — both lifelong passions.

Hauptman, now a Scarfsdale resident, wanted to improve her tennis game and she believed that the conventional horizontal and vertical stringing was contributing to uncomfortable vibrations in her right forearm and hand whenever her racket hit a tennis ball. She thought an alternate stringing pattern — a three-directional weave of two opposing sets of diagonals and a set of vertical strings — would minimize her discomfort by dispersing the impact of the ball in more directions.

The idea came from the snowshoe on her wall, which was

INVENTIONS INNOVATIONS

Please see RACKET, 4D

Scarfsdale woman co-invents special tennis racket that she says improves play and reduces the physical stress that is common with conventional models

Photo by Matthew Brown/
The Journal News

New tennis racket is labor of love

RACKET, from 1D

strung in three directions — somewhat akin to the design used by American Indians.

Hauptman calculated where to place the holes in a frame to string the racket and made schematic drawings of what eventually became known as the Mad Raq (Madeline's Racquet). She said the patented pattern was easy on the arm but never became a major commercial success, though she sold more than 15,000 tennis rackets with the pattern, and more than a half-million racquetball rackets. Hauptman said the racket was too hard to string and is no longer made.

She still continued to play tennis with the Mad Raq, however, because she found that it prevented twinges of pain in her arm that she had had with conventional rackets. Determined to build on the idea, she teamed up with David Luskis, a mechanical engineer from Honolulu, in the late 1990s and asked "How do we take a good idea and make it a great idea?"

Their work led to the PowerAngle Racket, which is diagonally strung in two directions. Hauptman said the racket improves a player's game and ends or lessens arm pain such as "tennis elbow." The racket has not, however, been scientifically tested to prove its claims.

"We set out to create a racket that would be a better racket than what was available," she said during an interview at South Shore Indoor Tennis in Port Chester. "We wanted to create a racket that would play better, be more comfortable on the arm and easy to string."

Today, Hauptman is the president and managing partner of Scarfsdale-based PowerAngle LLC, which does business as PowerAngle Racquets. Luskis is the company's marketing director.

Dr. Alejandro Berenstein, a

neuroradiologist at Roosevelt Hospital in Manhattan and PowerAngle's director of strategic planning, provided the entrepreneurs with much of their startup capital.

Hauptman declined to say how many PowerAngle Rackets she has sold, but she said sales are increasing.

Hauptman said her diagonally strung rackets perform quite differently from conventional rackets with their horizontal and vertical strings. Because of the two opposite diagonal sets of strings on PowerAngle Rackets are of equal length they vibrate at the same frequencies, she said. That means the impact of the ball is more evenly distributed around the frame so less shock is transmitted to the muscles and joints in a player's arm.

The strings on conventional rackets are unequal in length. That means the player's hand must compensate to equalize the vibrations, and because they are harder to control a greater shock is transmitted to the racket's handle, she said. Because of the impact of the ball is dispersed at unequal frequencies, the player's arm tires faster.

Hauptman said the PowerAngle Racket is also better because: ■ Their longer strings create a bigger and more balanced "sweet spot" — the best place to hit the ball.

■ The diagonal pattern has better traction so it better grabs the ball and keeps it on the strings for more "dwell" time. That means players can better control the ball and give it more spin.

■ There's a smoothness and effortlessness," said Kathleen Emerson of Pelham, who has used the PowerAngle Racket for about two years and likes the power it has. "Immediacy I was able to get low shots that I was not able to get before."

■ There is less friction of one string moving against another so

they "walk" less and last five times longer than string on conventional rackets.

"This is a phenomenal product," said Pat Rogers, a tennis professional and director of community tennis at the Yonkers Tennis Center, who has taught the game for 38 years. Rogers uses the racket himself and has recommended it to many other players.

"There is nobody who hits more tennis balls in a day than I do — probably a average 25 to 30 hours a week on the court," he said. "I noticed no arm fatigue. It's really nice to see a product that does what it's supposed to do."

Hauptman and Luskis have patented the specific stringing pattern they developed to determine the angles at which the strings should be placed in the frame and the mathematical formula they used to do so.

"The angle of the diagonal string segments are selected to avoid any shortening, widening, narrowing or other distortion of the frame," that patent says. They have a second patent that is on the clamp used to do the stringing.

The International Tennis Federation has approved the PowerAngle Racket for tournament competition.

Dr. William J. Wald, an orthopedic surgeon at the Westchester Medical Center in Valhalla, said tennis elbow is an inflammation caused by repetitive stress where the forearm muscle attaches to the bone on the outside of the elbow and may involve tearing and fraying of tendons.

Wald, who has never used the PowerAngle Racket, said reducing vibrations can relieve tennis elbow as can the racket's graphite frame. Dr. Peter McCarty, a life-long tennis player, is chairman of the orthopedic surgery department at Beth Israel Hospital in Manhattan. He also uses the racket.

"I've found personally that the

Stringing comparison

PowerAngle diagonals

Conventional stringing



The PowerAngle racket has opposite pairs of diagonal strings that are equal in length so they disperse the vibration and impact of the ball evenly around the frame.

Conventionally strung rackets have horizontal and vertical strings that are unequal in length. These different-length sets of strings vibrate at different frequencies and do not disperse the impact of the ball evenly.

Bill Beccaria/The Journal News

Source: PowerAngle.Net

mechanics of this diagonally strung tennis racket impart much more power to the ball with less force on the extremity," he said.

Rich Kaufman, chief umpire of the Harrison-based United States Tennis Association and chief umpire for the U.S. Open, said diagonally strung tennis rackets are not new. "There have been players who have used that stringing pat-

tern over the last 20 years," he said.

For now, however, PowerAngle has the only diagonally strung rackets on the market, said Don Hightower, spokesman for the Tennis Warehouse.com, which sells tennis equipment from more than a dozen manufacturers.

Hauptman said her diagonally strung rackets are better than ones in the past because of the angles

On the Web

www.powerangle.net
PowerAngle rackets are sold through www.tenniswarehouse.com and www.powerangle.net. Also, click the "sellers" link at the PowerAngle Web site, which lists places across the country where the racket is sold, including about 10 locations in the northern suburbs. Three variations of the tennis racket are available and they sell for \$189 unstrung and \$200 strung. The rackets are also sold through PowerAngle by calling 914-672-7271 or toll-free 877-769-3721. www.uspto.gov

To view the patents for PowerAngle tennis rackets go to the U.S. Patent and Trademark Office's Web site. Click on "Search" under "Patents." Then go to the "Issued Patents" column and click on "Patent number search." Type the patent number 6,080,997 and click on "Search." Then type patent number 6,280,355 and click "Search" again.

where the strings are place on the frame. She also hopes to apply the diagonal stringing technology to rackets used in other sports.

"We have diagonally strong prototypes in the works for rackets in those other sports," she said.

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