

Extracts

Classic Bow Redesigned To Shoot Farther, Easier

Inspired by the workings of a tape measure, an engineer says he has found a way to improve the bow used by hunters and warriors since antiquity without radically changing its form.

Dave Jenkins, a mechanical and aerospace engineer at the University of Florida with a longtime interest in archery, has redesigned the classic bow so it is easier to pull and shoots farther. Unlike the compound bow, a popular 30-year-old design that relies on a complicated system of pulleys and cables for its enhancements, Jenkins' adaptation is not easy to distinguish from the familiar model still used by traditionalist hunters and indigenous people worldwide.

"My bow has many of the performance characteristics of the compound bow but without all the cables and gizmos," said Jenkins. "It doesn't weigh much, and it's simple and easy to carry. With these compound bows, you feel like 'Rambo the Commando' or something."

The bow, patented by UF last year, may be of interest to bow hunters and target archers. Nationwide, there are roughly 3.5 million licensed bow hunters, said Mary Beth Vorwerk, spokesperson for USA Archery, an industry trade group. The total number of target and hunter archers nationwide is unknown, but the National Sporting Goods Association estimates the figure at 6 million.

Invented in 1969, the compound bow uses pulleys known as eccentric cams to make the string easier to pull as an archer draws the bow. This draw gets harder with traditional bows, which is one of the reasons it was revised. Compound bows are also easier to hold cocked at full draw, which improves shooters' accuracy because it

makes aiming more comfortable.

With a traditional bow the string travels at maximum acceleration the moment it is released, tending to wobble the arrow as it clears the bow. This has the effect of slowing and shortening its travel distance, Jenkins said. With a compound bow, the string hits peak acceleration near the end of its movement, which sends arrows on a straighter and thus faster path.

Compound bows comprise the vast share of the archery market. They are so popular, Jenkins said, because they allow hunters and archers who might otherwise not have the necessary strength to shoot arrows forcefully and accurately.

But Jenkins, an experienced hunter, said the bows leave much to be desired aesthetically because they are so machine-like.

He was casting around for ways to improve traditional bows when he was inspired by a tape measure on his desk.

Tape measures have a slight curl in their horizontal surface, which gives them considerable strength when they are extended in a straight line. As soon as gravity or some other force straightens the curl, however, they bend easily, which is how these seemingly straight objects retract into a circular coil in the case.

Like a tape measure, Jenkins' bow has a slight horizontal curl everywhere



Ray Caron

Dave Jenkins, an avid archer, demonstrates a new bow he invented that has a slight horizontal curl in its arms that makes it easier to pull and causes the arrow to fly farther without the complicated array of pulleys and cables on a compound bow.

but the handle. As the archer pulls the string, the curl gradually straightens, making the bow progressively easier to pull. When the archer releases the arrow the bow's curl returns, adding power to the arrow's flight. As with the compound bow, the moment of maximum power occurs as the arrow clears the bow, when the bow reaches its full curl, which also improves accuracy.

Jenkins said his bow isn't as effective as a compound bow, but it is superior to the traditional type. Although he said he hasn't done enough testing to peg the amount of improvement with certainty, he estimates it makes arrows fly about 10 percent faster than traditional bows.

As an engineering student at UF in the early 1960s, Jenkins, then active in target archery, said he toyed with the idea of improving the classic bow using the concepts he was learning in his classes. But he never followed through, leaving the compound bow to be invented by someone else, he said.

"I kept thinking, there has got to be a way to make a better bow with pulleys and cables," he said. "But I never did it; I dropped it. This time I'm going to finish it."

Dave Jenkins, daj@mae.ufl.edu

Aaron Hoover