Stress free golf shoe hits the links but will it swing?

Every few years it seems that each sport undergoes a revolution. We've witnessed tennis racquet-head size increase dramatically, roller skates go from quad to in-line and downhill skis change from a straight to an hourglass shape–to say nothing of the improvements in materials that are continuous in every sport. Once again it's golf's turn to set the industry on its heels –and in this case literally! The new golf shoe from U-Go United Golfers offers a moveable forepart and heel that allows the shoe to shift the weight of the player during the swing–rather than the player controlling the motion by 'natural' transition.

It's not surprising that, this time, golf's new innovation comes in the form of footwear. Golf is all about biomechanics, not speed or reaction time, strength or endurance. Direct from the biomechanics labs of Tübingen (as opposed to the racing tracks at Stuttgart), Germany, comes the 'Free Release Golf Shoe' from United Golfers. According to the latest press releases, this new swivel sole principle reduces stress on the hip joint by 89%, reduces stress on the knee joint by 99% and reduces stress on the ankle joint by 98%. Now, that in itself is quite a claim, even for the sport of golf, where there are probably more gimmicks, training aids, books of instruction and teaching equipment than in all other sports combined.

Improves the swing while preventing injury

The new golf shoe is the first to help treat back, hip, knee and ankle pain, torn knee ligaments, meniscus injuries, and Achilles tendon problems. The second claimed key benefit of the new revolutionary shoe is that it significantly improves the golfer's swing–by effectively stabilising the body's centre of gravity. The pivoting movements made by a golfer when wearing a conventional sole are almost completely eliminated, since the torsional forces on the knee joint are transferred to a unique turning mechanism on the sole of the Free Release shoe. This is both encouraging and

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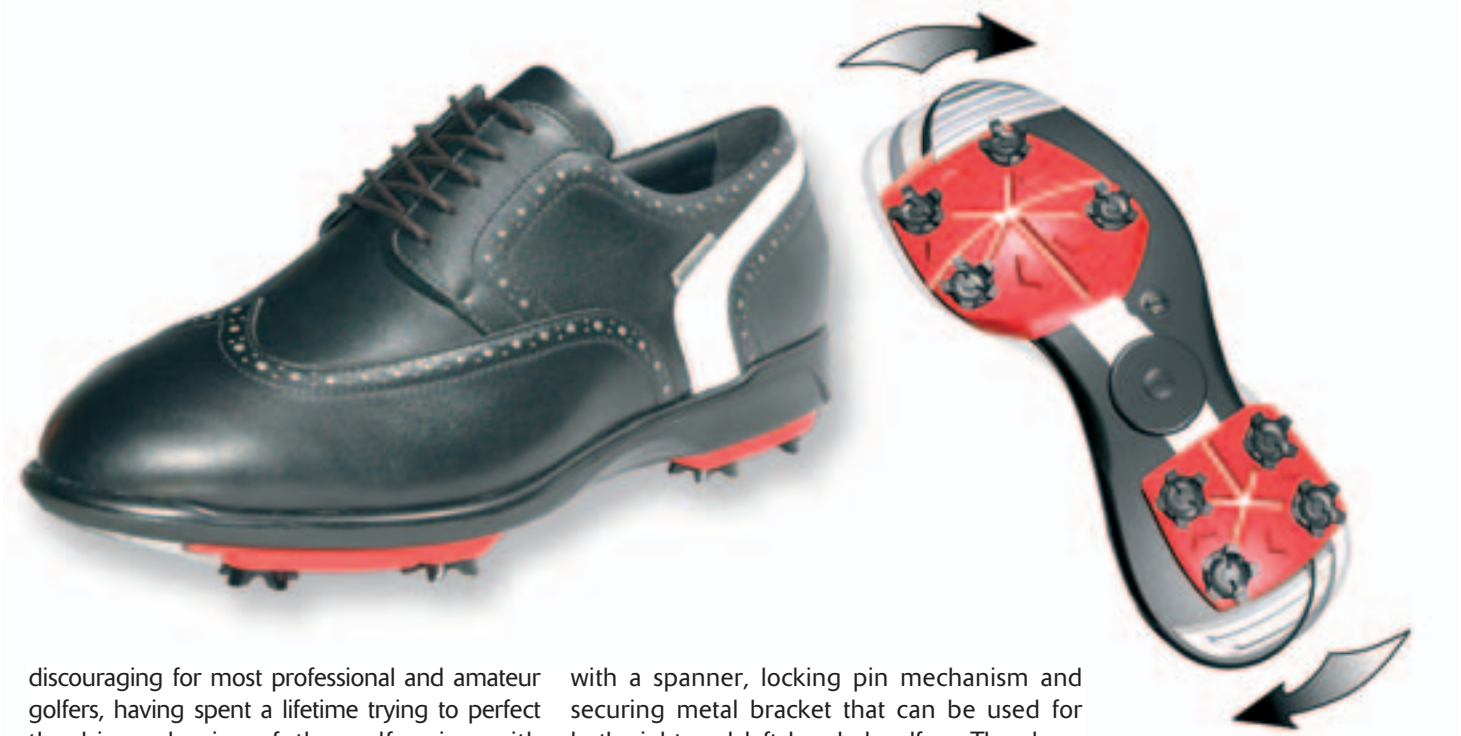

United Golfers new Free Release shoe is fitted with a sole that rotates up to 20 degrees. The company claim this revolutionary turning mechanism shifts the strain exerted by the golf swing on the hip, knee and ankle joints.

United Golfers

discouraging for most professional and amateur golfers, having spent a lifetime trying to perfect the biomechanics of the golf swing with conventional footwear.

The inventors, Andrea and Frank Drollinger from Pforzheim, have termed this patented sole innovation the 'stress transfer principle'. The advantages of the new golf shoe, which also features other quality components such as an anatomical cushioned sockliner and U-G removable spikes, have been scientifically demonstrated by extensive trials at the University of Tübingen, supervised by Prof. Viet Wank and Prof. Frank Schiebl, with the support of PGA pro Peter Eisenhuth. Stressing previous injuries to leading pro players such as Tiger Woods and Ernie Els, the company feels potential demand for this invention could be immense.

A wing-tip design but with an extra feature

The shoe model itself is styled with a traditional wing-tip design and comes in black with a prominent contrasting white heel underlay and a saddle black and white version. The company has chosen a high quality full-grain waterproof leather upper with soft goatskin leather lining. The upper design incorporates a padded tongue with a dirt and water resistant finish, padded top-line for ankle comfort and a pre-moulded heel counter for correct heel alignment. The outsole mechanism, however, is the distinguishing feature of the shoe.

The 'Free-Release' sole system is made up of two swivelling heel and forepart plates linked together in the waist portion of the sole with a connecting metal external rotating shank. The sole material is thermoplastic urethane (TPU), containing four interchangeable U-G spikes on both the movable heel and forepart plates. The two connected swivelling plates are adjustable with a spanner, locking pin mechanism and securing metal bracket that can be used for both right and left handed golfers. The shoes come with a complete and very detailed set of instructions for use and cleaning. The company obviously recognises the sole mechanism's potential to clog under muddy and soft grass conditions and tries to stem any criticism in advance by stressing the importance of keeping the sole free from dirt — not an easy task as any golfer will attest.

Another challenge the new shoe company tackles head on is to emphasise the 'advantage' of the new 'stress transfer principle' in terms of injury prevention. This is a little trickier as it involves a complex set of biomechanical adjustments in the golfer's lower-body centre of gravity and weight shift – affecting the upper-body swing itself.

A change in swing

Any drastic change in sports equipment must, by definition, affect a player's learned and practised pattern of biomechanics. (Strokes changed in tennis when the over-sized racquet was first introduced by Prince in the 1970s and skiers adjusted their weight-shift-and-turn action with the introduction of hourglass-shaped downhill skies to assist skiers carving their way down the slopes.)

Classically, in the golf swing, weight is shifted slowly onto the back foot by using the rotational power of the large muscles of the (right) leg. During the 'transition' or down swing, approximately 80% of the golfer's body weight is shifted around the (left) hip onto the outside of the left foot. At impact with the ball, about 90% of the player's weight should be on the (left) foot. In the 'modern' golf swing some foot movement or 'raising' is permissible – but not encouraged. In the shoe instructions from

United Golfers, no displacement of the weight in the backward swing onto the foot is recommended. Also, during the down swing and at impact in the forward swing movement, with the U-Go shoe there is a certain delay after the swivel movement of the leg and hip. The new golf shoe follows the forward swing movement allowing the pressure loads to both left and right foot to remain equal. Tests with the new U-Go golf shoe revealed that forces of 270 Nm (Newtons – unit of force) exerted on the hip, using conventional golf spikes are reduced to 29, on the knee from 85 Nm to 0.9 and on the ankle from 530 Nm to a mere 10.5.

With such reductions in force on the body's joints or pivot points, the new shoe would appear to offer hope to the ageing golfer and possible injury prevention for all active players. The change and adjustment in biomechanics necessary to wear the new shoes without immediate loss of ball distance and accuracy is another issue. Usually, acceptance of change in sports equipment or technique is instigated at the top of the player 'food chain'. Established players, at the peak of their game will be reluctant to tamper with their swing or equipment to try such a radical invention. However, players looking to make a change in their game or players suffering a career threatening injury may well opt for any piece of equipment offering relief.

Will it meet with official approval?

The new Bionic golf glove from Hillerich & Bradsby Inc., offering players a patented pre-rotated finger design, has been a commercial success, albeit unrecognised by the PGA and LPGA governing bodies for use in tournaments.

Footwear, being the largest sports equipment category, with the other two being soft goods and hard goods, has seen its share of innovations over the years. Sometimes a new shoe feature is successful in revolutionising the sport, as with the adidas 'Predator' spin-imparting material used prolifically in soccer shoes. And, sometimes not – as with Puma's brush track spikes that created world records before being officially banned from the sport by the IAAF in 1968. Spira's concentric metal spring innovation in running shoe midsoles is a current example of an injury-preventing feature. The shoes are well-accepted by runners and at the orthopaedic level, but not yet allowed for official race competition. The larger the participation in a sport, the more risk is involved for a 'major' manufacturer to invest in revolutionary equipment change. Perhaps that is why so many 'revolutionary' changes in sports equipment are introduced by smaller start-up or niche companies.

Improving performance and helping to prevent injuries are obviously not the only criteria in shoe innovation—they have to pass the governing body's equipment rules tests first.