# Sharp Shape

BY EDWIN BLACK

This year, approximately 60,000 custom foot orthoses will be expertly fabricated using an automated CAD-CAM system few doctors know exists. The system generally is not deployed in labs that openly promote themselves as "automated," such as Piedmont and Bergmann. Rather, it can be found behind the scenes in old-line custom labs that use CAD-CAM as a manufacturing efficiency, not a selling point. Moreover, you probably won't see advertising or flashy press releases from the company behind this system. Despite its low profile, Sharp Shape, an unincorporated company operated by the shy and quiet Alex Shang, PhD, has made an unmistakable impact on the field of orthotic automation. His name and system are known by virtually every lab that has considered a CAD-CAM system. And within a few months, he plans to introduce an office-based foot scanner for general practitioner use.

Dr. Shang can be called a genuine pioneer in the orthotic automation field. In 1990, he moved from his native Beijing to Arizona, where he joined a NASA project at Arizona State University. When the project lost funding, Dr. Shang answered a newspaper ad to join the ill-fated Ammon system, which many thought might become a standard in the industry. Dr. Shang was a principal developer of the system, years before many thought foot scanning was possible. After Ammon went bankrupt, Dr. Shang set off on his own to engineer industrial-strength orthotic scanning and fabricating systems for orthotic labs. Shunning hype and claims of grandeur, Dr. Shang did not try to establish a profitable network of labs or corner clients into royalty agreements filled with small print. Instead, the soft-spoken Dr. Shang sought only to sell his handcrafted technology to one client at a time. The price: $35,000 per copy.

The Shang system is not called the Razzle Dazzle 9000 or OrthoGalactic II but goes by the sleep-inducing name of Automated Orthotic Manufacturing System (AOMS). What the AOMS lacks in logo savvy, however, it makes up in pure orthotic wizardry. It is impressive enough to be used by mainline perfectionists such as Allied OSI, Burns, Foot Management, ProLab, and Solo. These labs don't advertise themselves as automated labs, so they have adopted Sharp Shape technology as part of their custom fabrication philosophy. The sixth Shang user is Bloch, which does trade on its CAD-CAM capability (*Bloch Orthotics—On the Scanning Edge*, September 1996). Two more companies have nearly committed to Sharp Shape. Dr. Shang declined to identify them for the record, but *BioMechanics* has learned their names: one is a multispecial lab and one is for a consumer-oriented company. The lab-based Shang system has even been recommended by at least one competing automated source when a buyer wanted on-site milling.

## The Direct Approach

Dr. Shang personally developed Sharp Shape technology. It includes an in-lab laser scanner, software to realize and correct according to the lab's orthotic approach, and a miller interface custom-engineered to each client's specifications. The Shang system excludes the miller, which any lab can acquire for between $35,000 and $100,000. Once the miller is connected, the Shang system allows direct milling; that is, the milling machine can carve the top and bottom of the appliance out of a larger sheet or

*Few know his name, but many practitioners have benefited from his systems.*
*Alex Shang, PhD, is a quiet but very real factor in orthotic automation*

block of semirigid plastic. Characteristic milling striations are left by the drill bit.

Dr. Shang did not know it when he independently developed his system, but direct milling may technically infringe the patent rights of ADT, according to Sharp Shape and sources at ADT. It would take a lot of lawyers, more money than anyone wants to spend, and a few years of aggravating litigation for a court to decide. A thicket of ADT-related litigation in the automated orthotic field has already wasted enormous resources, and nobody needs any more of it. Moreover, a decision on the enforceability of ADT's patent could go either way. The issue is fundamentally moot, however, since Shang sites that *BioMechanics* contacted use the AOMS system not to mill directly but to create a three-dimensional positive intermediary which then becomes the basis for thermoforming the ultimate device. One lab source said, "I don't want direct milling because I can't get the control I need. That's why I go to the positive." Creating an intermediary avoids the patent question.

### Foot Scanner Ahead

Sharp Shape is now taking the next step, creating an inexpensive office-based foot scanner that would be compatible with the six or more labs using the AOMS system. Shang's new scanner openly concedes certain limitations. It only captures a non-weightbearing or semi-weightbearing plantar view through a flat, clear platform. The patient's foot is pressed against what looks like a photocopier plate for a single-line laser scan. Indeed, the process resembles photocopying the foot. Two units are now being tested. Dr. Shang declined to identify where, but *BioMechanics* has learned that Allied-OSI and ProLab are the test sites. The new scanner "is only the second accurate scanner to allow proper cast correction techniques," says Dr. Paul Scherer, owner of ProLab. Tests are going well, sources say, and Dr. Shang hopes to mass market his scanner to all biomechanical professions for $5,000 per unit.

Dr. Shang claims that although he has no mass marketing experience, he is prepared to compete toe-to-toe with the other scanner manufacturers. That, of course, is easier said than done. Start with the name. For example, Benefoot's scanner is the ScanCast 3D. Bergmann's is the Bergmann 2001. ADT's scanner will be called the BioScan. Those are catchy names. Shang's new scanner will be called the 3D Dual Laser Foot Scanner. I'm drowsy already. A catchier name, say, the "Sharp Shape," would avoid confusion with Benefoot's product and create a clearer brand identity. The idea is free for the taking, Dr. Shang.

Developers traditionally have lacked the flare and pizzazz necessary to capture the fascination and confidence of detached buyers. Marketing savvy is crucial in the foot scanner business. Foot scanners require a proliferated installed base to make sense. Technology without marketing is like a tree falling in a forest with no one to see it. But by whatever name and at whatever success level, the entry of the "Sharp Shape" foot scanner early next year will add diversity to the expanding market. ●