

*Do you often think about your feet during the day? If the answer is 'yes', your shoes probably do not fit properly and that puts you in the majority. The fact that you do think about your feet during the day probably means you are experiencing discomfort and that's a bad thing.*

# If the shoe fits

Bill Tippit, Sr.

**F**orcing your feet further back in your shoes because your bunions are sore, taking them off to give yourself a quick rub over the arch or developing calluses or blisters are all symptoms of poorly fitting footwear. Arriving home at the end of the day and being able to remove their shoes is a blessed relief for far too many.

The problem is not limited to isolated demographic groups based on race or geographic location alone. Nor is it just the fault of fashion and the seemingly endless pursuit of higher heels and narrower toes. The problem is really quite simple and while the solutions are more complex they are available nonetheless, and could be implemented more easily than you might think.

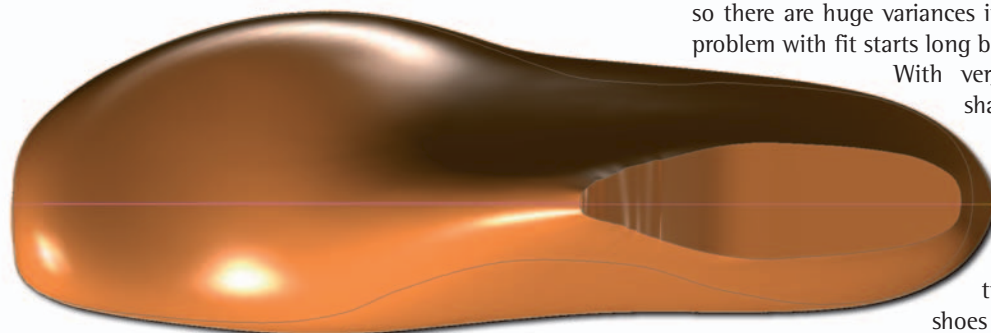
There was a time when we thought (probably falsely) that we could associate these shape demographics with geographical regions. However, decades of inter-racial marriage and continental population shifts have drastically weakened any theories that certain regions of a country or the world have people with a specific foot shape. The last bastions of this ideology are probably Asia or Africa, where feet are certainly proportionally wider than those areas that have been more widely industrialised for many decades.

## The last thing we need

As previously noted, individual feet change in shape and size, so there are huge variances in any given market. However, the problem with fit starts long before these factors come into play.

With very rare exceptions, today's last shapes are geared more towards efficient production than even a generic attempt at good fit. Basic measurements may be within 'industry standards' but what about shape? There was a time in the mass production of shoes when lasts were shaped more like

the typical human foot. However, in an effort to simplify pattern engineering and increase manufacturing productivity, lasts have morphed into the nearly symmetrical 'cigars' we see today.



*The best fitting last ever made? The famous 'Munson' last shape as used by the US Military since 1917*

## The shape of things

The two most prevalent and widespread problems are the shapes and sizes of the lasts footwear is made on. The quest for universally well-fitting footwear is the ultimate carrot on a stick, but it can never happen with 100% success.

To begin with, the target—i.e. the foot—changes shape and size during the course of the day. Depending on your body's makeup, your daily routine, the climate and other factors, your feet can expand in girth well over one and even up to two sizes during the course of the day. So, regardless of how pliable the shoe or how closely the last matched the foot in question, it is fantasy to expect a relatively static object like a shoe to keep up with the dynamics of the human foot from early morning to last thing at night.

We can then add the wide array of different foot shapes that exist in the world. It is bad enough that no individual has two feet that are identical in shape and size. A shoe company marketing its product globally has to cope with foot variations such as a wide forefoot, a narrow heel, a high instep, low arches, and high arches as well as other anatomical anomalies.



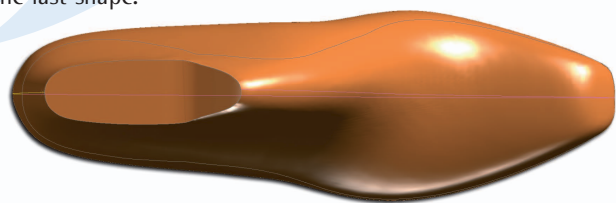
*Typical modern last*

The typical modern last is very straight, with the cone virtually centred and the bottom nearly symmetrical except for ball displacement. These characteristics are beneficial for pattern engineering and fast easy lasting but harmful to many feet as they attempt to straighten out the natural 'swing' of the foot.

Evidence of the benefits of properly shaped lasts is not unheard of, even in today's mass production. Western boots are a constant fashion item in some circles and, as recently witnessed, sometimes become a mainstream trend. However, many mass market styles are made on lasts that hardcore ➤

## WORLD FOOTWEAR

boot makers would never use and the resulting fit quickly relegates these boots to the back of the closet. Anyone who has ever worn a true Western boot that has been properly made on a classic last knows it can be the most comfortable and supportive footwear you will ever wear. The reason is simple... the last shape.



*Classic Western Boot last*

Classic Western boot lasts are not shaped to facilitate pattern engineering or to speed up production. To begin with the forefoot curves towards the medial (inside) side more than a typical shoe last. The cone also slants to this side as it runs forward from the instep to the ball and the bottom radius is usually slightly off centre, again towards the medial side. The backparts are much more sculptured than even some pump lasts, heel widths are narrower and measurements are much tighter in the ball and vamp area.

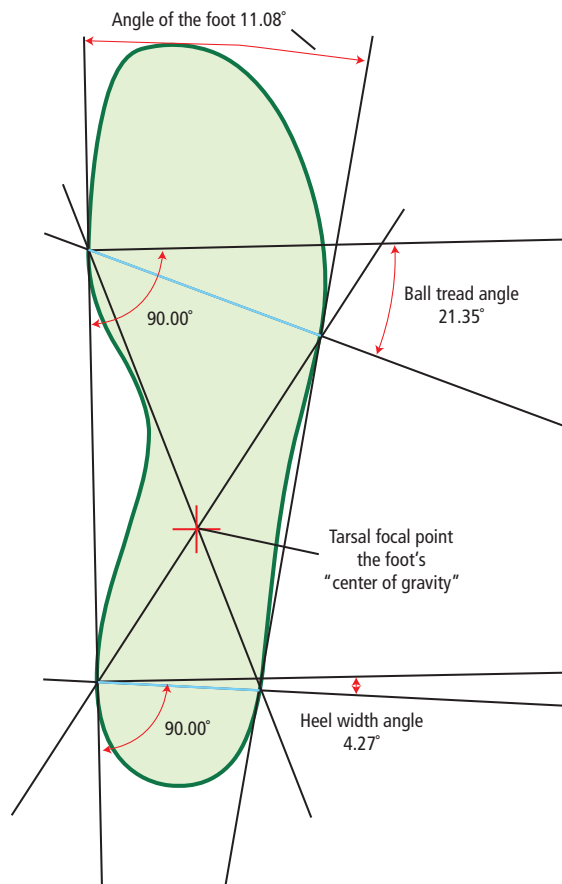
All this is to make the boot fit and prevent the foot sliding forward or the heel slipping. The short heel measurement is properly proportioned to the rest of the foot so that when you pull the boot on, you almost 'pop' into it. This sometimes requires a boot puller to make it easier for you to get out of the boot but it's a slight inconvenience when you have had them on all day and never thought about your feet because they didn't hurt. This is the way *all footwear* should feel.

### Get into the swing of things

No one would ever suggest that last shapes should be available in the mass market to fit every person precisely. That is simply not feasible except in custom footwear. Even then you still face the challenge of the foot swelling during the day. However, a handful of last categories that addressed the main foot types would go a long way towards eliminating many of the more common problems people face when trying to purchase shoes off the shelf.

Lasts with narrow heels, high and low arches and high insteps would help, but perhaps the most important factor is the alignment or 'swing' of the foot. Stand up and look down at your feet without shoes on. Some people may actually see very little medial slant to the upper bones of the feet and the pronation of their feet might be so slight as to make the foot appear to be straight or in rare cases, even supinated towards the outside. But these cases would not be the norm. A typical foot will indeed have the look and alignment of a classic Western boot last.

So, what are we to do if the goal is to have a last that will make the shoe you want and fit as many people in as many countries as possible, using different grading systems? Today's automation and 3D CAD technology mean that the mass market could be provided with a much wider spectrum to choose from when they purchase footwear. And, rather than simply offering many sizes and numerous widths as was done years ago, it might be better to limit those parameters and opt instead for foot types.



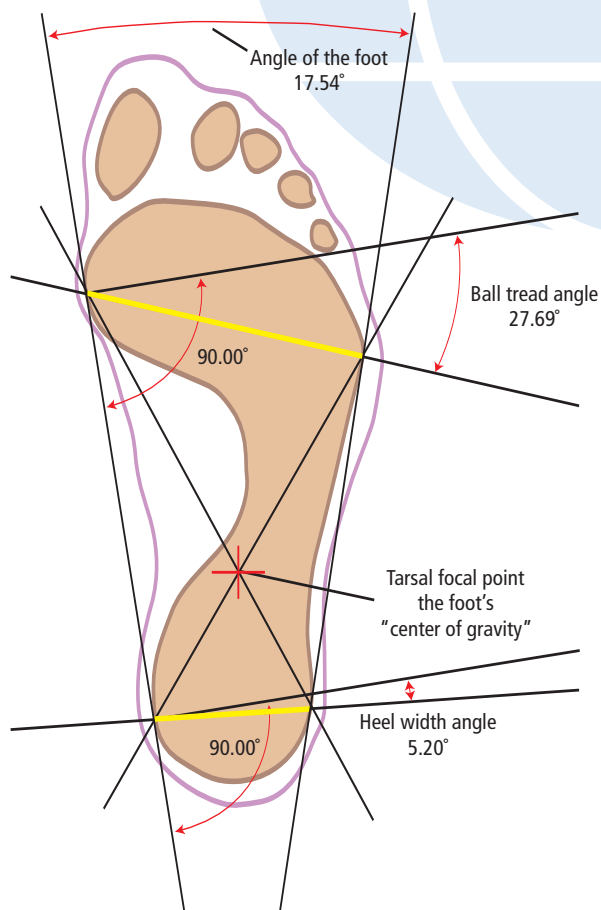
*Last bottom layout using the William A Rossi method (1947)*

The dark green perimeter line illustrated above is the featheredge of the last and the two straight blue ones show ball tread and heel width. With the technology now available, we can apply this logical methodology with much greater impact. By grouping lasts according to key fit points such as foot angle, ball tread angle, heel width angle and the location of the centre of gravity, we can achieve much greater success in terms of fit. Simply grading a wide range of sizes and widths often fails to take into account the bone structure or biometrics of the foot.

The value of producing only two or three widths within the same basic size ranges we see today, but offered with options of narrow heels and several different degrees of pronation might substantially increase that mythical 80% of the people that the industry says it hopes to fit. Virtually all the studies over the past 100 years have advocated a radical change in the alignment of the lasts used to manufacture shoes and still it hasn't happened. The technology now exists to make it not only feasible but logical and profitable as well.

The same layout shown in the first diagram can be applied to feet with shape groups based on a range of angles and centre of gravity locations. Four or five foot groups in these categories would provide a much more logical basis for fit than merely making the shoes wider or narrower while still trying to force the foot into a shape that is not suitable. Here, the brown perimeter lines indicate the actual bottom surface of the foot (including toes) where it would touch the floor in a standing, barefoot position. Ball tread and heel widths are shown as before but in yellow. The dark purple line is the widest volume

## FOOTWEAR TECHNOLOGY



### *Developing the Rossi method*

point of the top of the foot and would correspond to the upper surface of the last at its widest point.

Using software programs such as those from Lectra and Newlast, last styles can be quickly modified and reproduced without the time consuming manual model making process that was required in the past. Design lines can be superimposed on the 3D last data and then copied and pasted on to other last shapes in the system. This 3D design data can be flattened along with the last forme to be used as the basis for 2D pattern engineering.

A base last shape could, therefore, have several alternate shapes that could be quickly created and the process of converting the existing shoe style to the new last shapes would be but a fraction of the original design and pattern engineering process. True, there would be additional inventory of pieces and, depending on the manufacturing process, perhaps dies and some moulds; however, this effort and expense should result in more customers and happier customers.

There would be less pain and discomfort, sales and repeat customers should rise and lost sales due to a lack of fitting choices should fall. Literally, at the end of the day customers should be thinking about their shoes with fondness or at least not thinking of them at all. When the time comes to buy another pair of shoes, the consumer won't remember how cute those little red pumps looked the day she bought them as much as how often she couldn't wait to get them off after a long day at the office. If she had a better alternative, it's a good bet she would try it. 

# Styletek® Styletek® Styletek® Great “Where $\wedge$ Ideas take shape”

- Molded shoe components
- Insert Molding
- Lasts [Horma S.A.]
- Leather [Medina-Torres]
- Heels-plastic/leather /fiber board
- Fabricated leather soles
- 3 Dimensional molded labels
- Complete sourcing services from Mexico for all sewn products, finished footwear and components
- Global mold making services
- Vacuum forming equipment

### **Styletek Inc.**

#### **Manufacturing & Global Sourcing**

1857 Middlesex Street, Lowell, MA, USA 01851

Continental U.S. and Canada

Call 1-800-843-4335

International Call 1-978-452-2881

Fax 1-978-452-3918 or E-Mail [info@styletek.com](mailto:info@styletek.com)

Visit our web site [www.styletek.com](http://www.styletek.com)

**We proudly produce unique “Stuff”**