

## CASTING METHODS & SPECIALTY FOOTWEAR

### CHAPTER 16

#### MORE SPECIALTY FOOTWEAR TECHNIQUES



## OBSERVING AND NEGOTIATING WITH CAST AND LAST ALIGNMENT

Proper cast and last alignment is the key to all “good” molded footwear. There are NO predefined sets of answers because every person and every foot is unique. What is perfect for one person may be incorrect for another person.

The artisan and/or craftsperson will have to make his or her own decisions about what to do and how to do it most correctly. There is an inner thought process which starts with observing everything possible, then assessing what aspects appear to have the most priority, and then negotiating the best compromise possible for the individual wearer.

The artisan and/or craftsperson has to use “every trick in their book of experience” to come up with the most correct alignment in all directions. The final alignment is only as “good” as the judgment of the footwear fabricator. Sometimes, it just amounts to “try it this way” and assume the consequences of needing to make alterations later or even to “remake” (doing the work over again in part or in full).

The alignment of casts and lasts in specialty footwear fabrication can be a real challenge!!!

My thought processes vary with each customer. Most likely, I will ponder many of the following considerations.

What is the person like? Yes, I am influenced by their personality. I try not to judge them. I try to accept them as they are. I try to find something in them which is of interest to me and something we have in common. I need to consider their age. I need to consider the physical condition of their body. I need to consider their overall body structure and alignment. I look at how they stand. I look at how they sit. I look at how the casting was in their likeness. Or, how the casting was not in their likeness. I need to figure out what are the best natural aspects of their feet that are relevant to the making of molded footwear for them.

Then I need to consider what areas of concern need to be accepted and/or addressed for the cast and/or last in order to make a “good” fitting and comfortable shoe, boot or sandal for them.

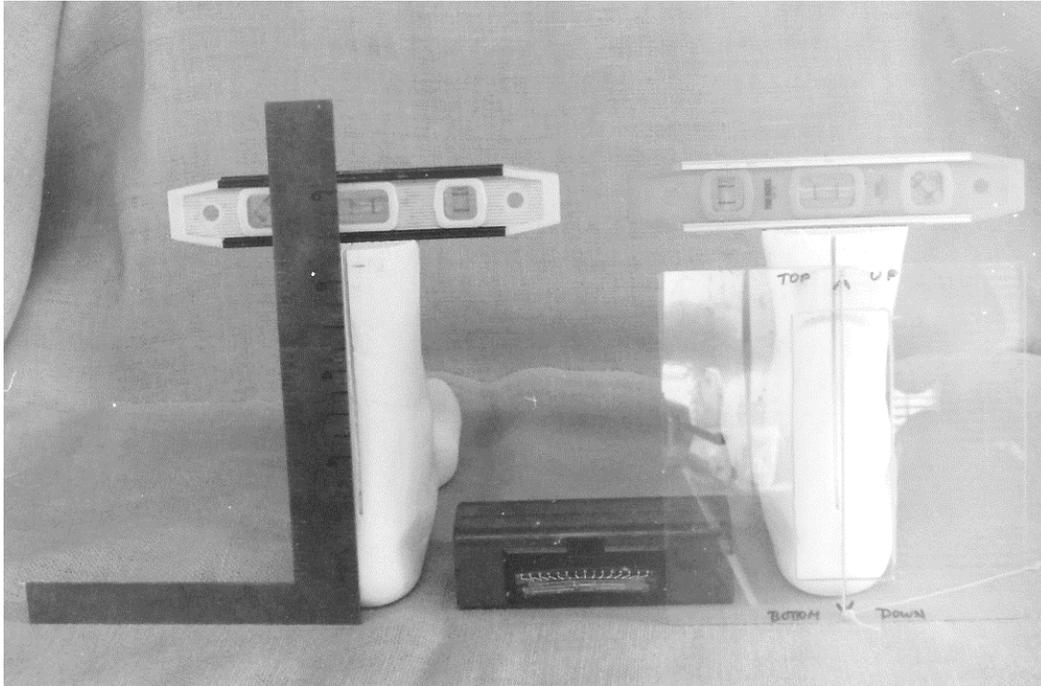
Everything is important to the consideration of what should the proper alignment be for the wearer. And, how can that alignment best be achieved. And, how can the desired alignment be designated so it can be maintained throughout the entire footwear fabrication process. It is essential that the designation of the desired alignment be re-measurable from some point of reference at all times until the footwear is completed.

It is very important to observe the full body balance and symmetry of the client. It is very important to observe the gait with and without footwear before casting. Look for the toe lifters as the feet come off the ground and they step through mid-air.

I think the standing vertical string is very important to the understanding of alignment. Please recognize that it is made with the person standing on a flat and level surface. Therefore, that alignment is that alignment. When we cast and reproduce a contoured form of the feet from a sitting position, the alignment may not be the same as standing. The bones and muscles definitely change alignment in different body positions and with every body movement.

We are dealing with dynamic human anatomy.

The final decisions the artisan and/or craftsperson makes pertaining to the selection of proper alignment are entirely subjective. That is going to be a part of your learning process. That is another reason why you should learn to make your own molded shoes, boots and sandals.



Please think about the importance of alignment for the whole molded footwear fabrication process. Really ponder why it is important and how you can improve your understanding of alignment. You have to be able to make alignment work for you. You need to know what you are doing with alignment in each and every process. The better you can handle alignment, the better footwear artisan and/or craftsperson you will become.



1 Notice the raised vertical marking in the back of the plaster cast that has been caused by the placement of the vertical string on the foot before the casting.



2 After the casting shell is poured up, the outer shell is removed. Be sure to mark the vertical string ridge with an indelible pencil. Try to mark it as straight as possible because sometimes it gets bent in the casting process.



3 Inspect the string mark closely, but the position after placement is not infallible. Maybe the string came loose.



4 Perhaps the person created a new alignment while sitting and that is now the position of the mark on the cast.



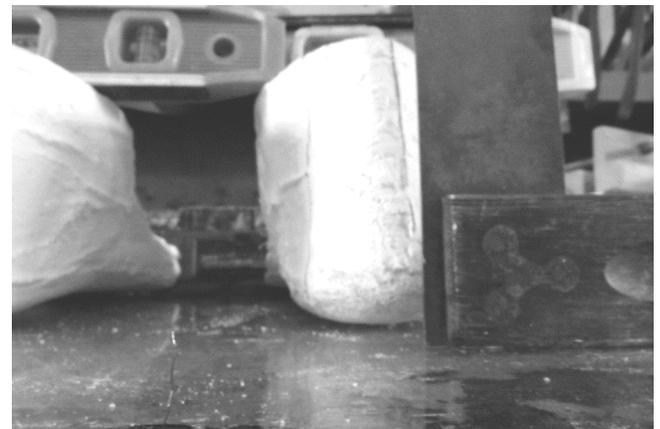
5 You will have to wrestle with any disparities. That is why you need to look at the whole cast in order to ascertain the true and/or natural alignment position for that foot. Please reread the preceding sentences. They are very important!



6 Remember, the cast is only a replica of the foot at one particular moment in time. The position of the foot may not have been in its best position. But, the cast is what you have to work with unless you want to take another cast.



7 If you did the casting, maybe you can remember what the person was like when you placed the vertical string and how the person sat when they were casted.



8 Now you have to use your head and decide what you think will be the best way to use alignment for the wearer.



9 I try to select the best alignment for the wearer. Sometimes I accept the string alignment as perfect. Other times I make a small adjustment. Then I transfer that vertical line to a flat horizontal top of the cast.



10 But, before you go too far too fast, really look at the foot from all angles again. The bottom is important too.



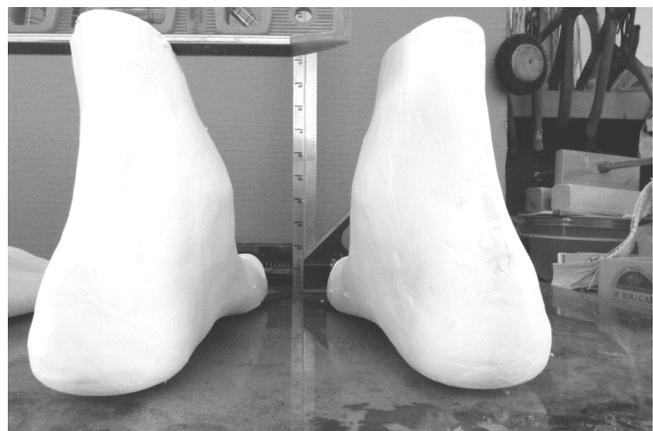
11 Ditto.



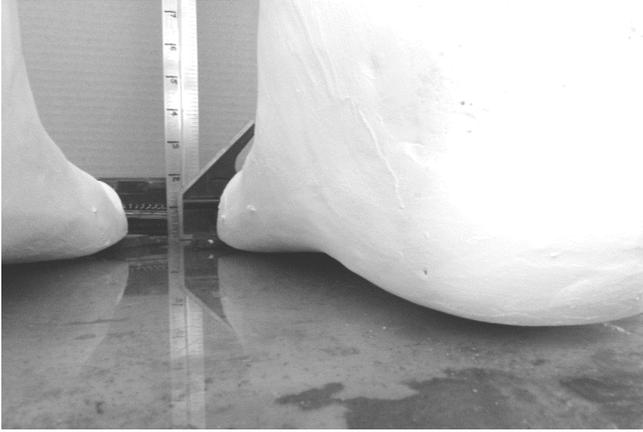
12 The bottom of the arches are important too.



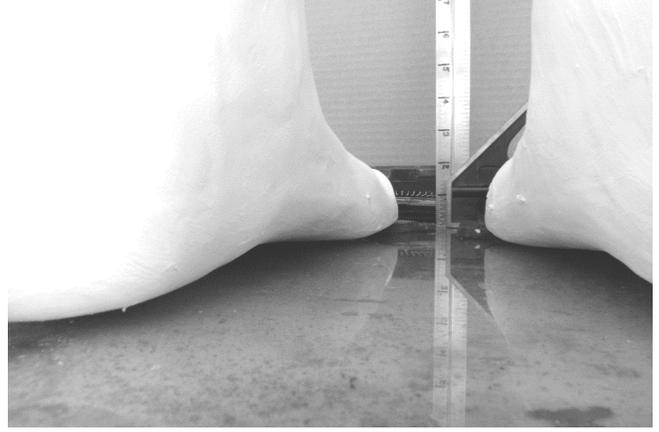
13 Ditto.



14 The ankles are important.



15 Always compare left and right.



16 Ditto.



17 Look at the lateral arches.



18 Compare left and right.



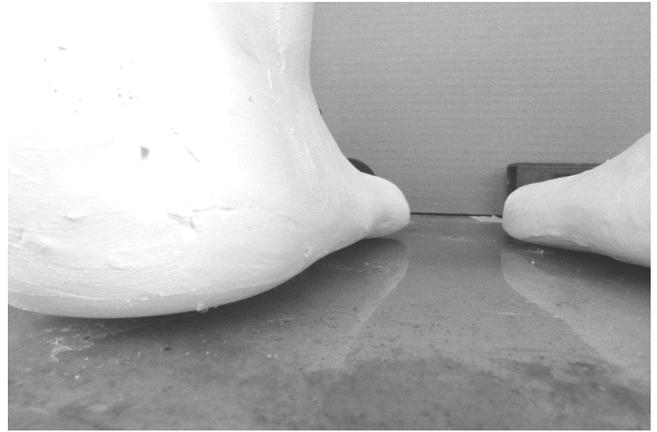
19 Look at the backs again.



20 Look at the arches again.



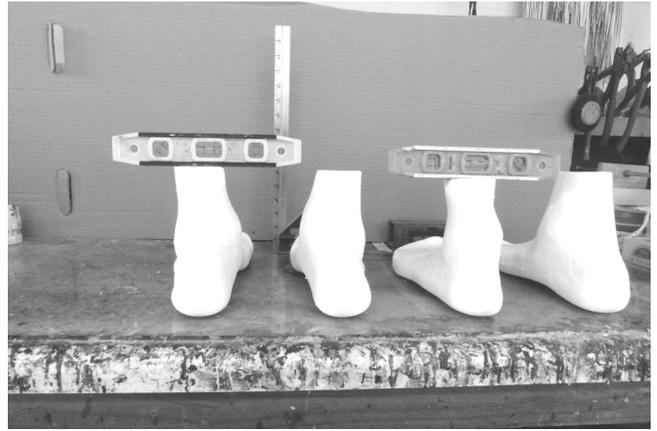
21 Ditto.



22 Ditto.



23 Ditto.



24 Sometimes you might have multiple lasts of the same person. Look them over, make comparisons. Sometimes they are similar and sometimes they are different.



25 Ditto. Casting and making lasts is an art, not a science.



26 Ditto.



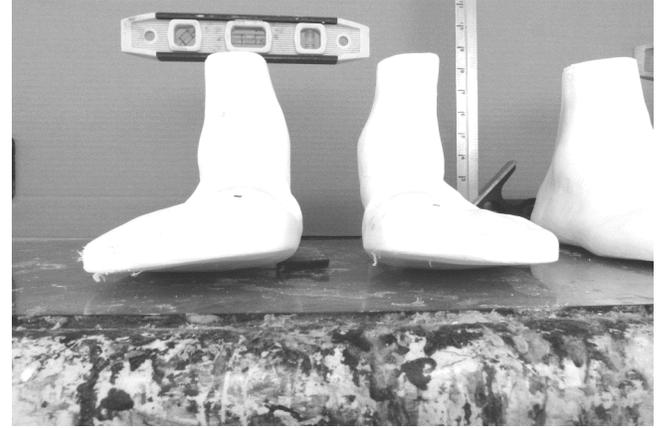
27 Ditto.



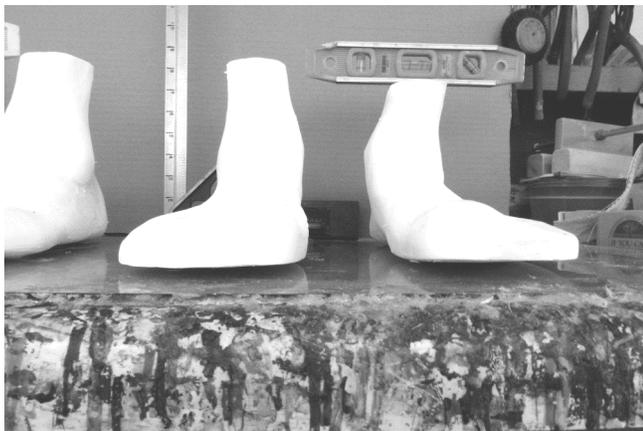
28 Ditto.



29 Ditto.



30 Do you really see what you need to see? It takes practice to see what is important. The level on top is the new point of reference.



31 The level on top was derived from the vertical string and the judgment of artisan and/or craftsman.



32 The level is so important to your success.



33 Use the level over and over again until the fabrication process is finished.



34 I use three levels. One for the bench top, one for the right last and one for the left last. They need to be in agreement.



35 Now, notice how the decisions about alignment transfer into the finished footwear.



36 Ditto.



37 Ditto.



38 Ditto.

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39 Ditto.



40 Ditto.



41 Ditto.



42 Ditto.



43 Ditto. Now, please observe the alignment of some lasts.



44 Please observe your casts and lasts from every angle possible. You need to look to learn.



45 Ditto.



46 Ditto.



47 Ditto.



48 Ditto.



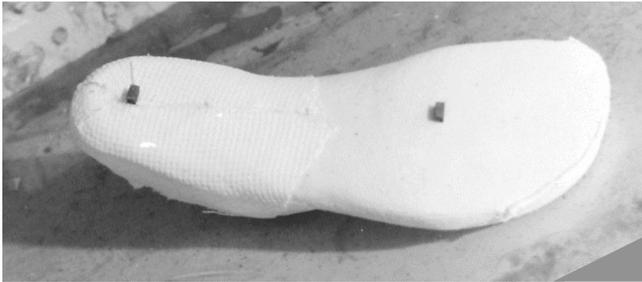
49 Ditto.



50 Ditto. The original vertical string has been replaced by the level on top of the cast or last. You get to use this reference all the time and it will help you make better shoes, boots and sandals.

FABRICATION TECHNIQUES

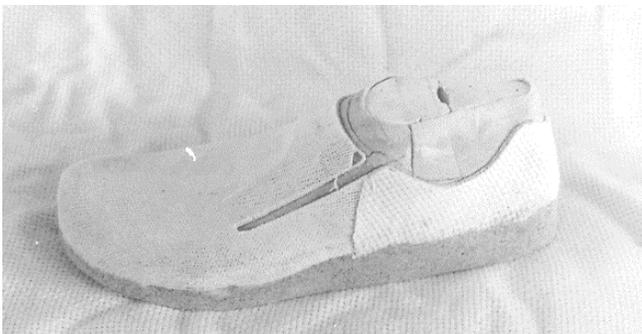
You can use some or all of these nifty techniques for the fabrication of your own shoes and/or develop many of your own ideas.



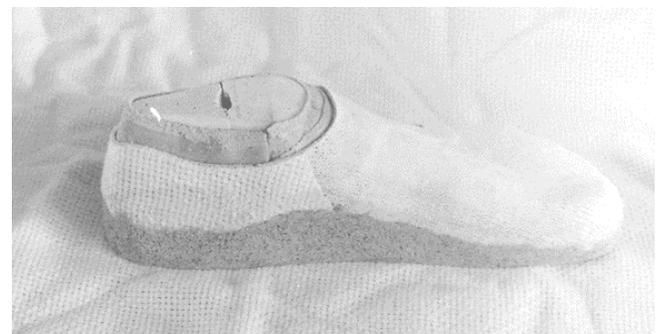
51 I have cut small pieces of soft mid soling material and glued them to the center line of socked last before "mudding" in order to have a thicker "mud" base.



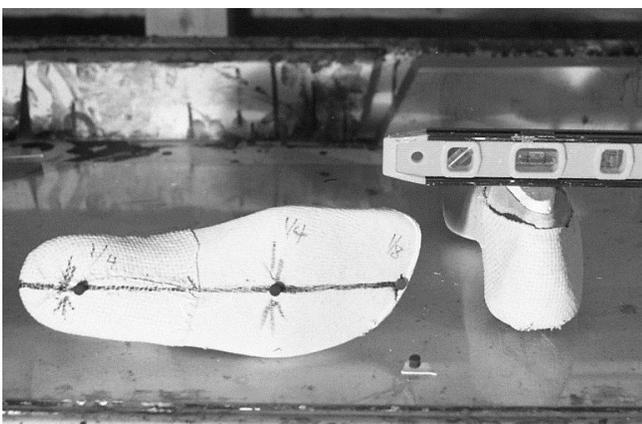
52 When sanding the "mud" base on the flat belt sander, I stopped when these pieces appeared. I didn't sand all the way to the sock. The thickness of pieces would be dependent on the thickness needed for the "mud" base.



53 The lateral view of the light weight "mud" base of the shoe pictured above.



54 The medial view of the light weight "mud" base of the shoe pictured above.



55 The same technique, but inclusive of the tip of the toe, and offset to accommodate the balance and/or required wedging necessary for an abnormal right foot.



56 This pair of shoes was for a podiatrist who told me exactly what he wanted, but didn't know how I should do it for a molded shoe.



57 The finished shoes showing removable inserts.



58 Same picture, but showing outer sole tread design (a non-slip orthopedic type of pattern).



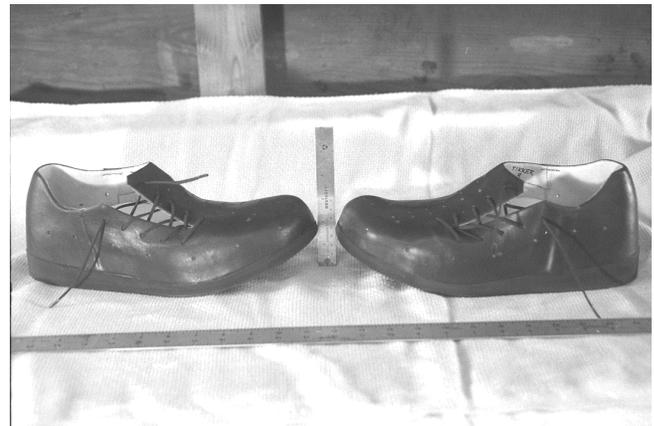
59 The podiatrist said he wanted more toe rock because he was acquiring a dropped foot condition (old age) and didn't want to trip. I cut these grooves so I could get the materials to flex and hold the new bend.



60 Dremal® tools can be very useful. And, five minute epoxies are great work savers.



61 I bent the grooved soling, filled in the five minute epoxy and held the soling in position for five minutes. Then I put the original outer sole back on the shoes.



62 The podiatrist said the fix was great! He wanted a pair of golf shoes built the same way.



63 Once you start making internal (leather covered) lifts for molded footwear, it is hard to make precise measurements if you have not made good calculations prior to starting the fabrication process. Until the last is removed from the shoe it



64 can be very hard to measure without a definite measuring point of reference. One answer is to put the shoes on a flat (glass) surface and use some machinists measuring tools.



65 These measuring tools are originals from the MURRAY SPACE SHOE® factory which was in Bridgeport, CT. These devices can save the day when they are needed.



66 An alternative is to use upholstery needles which can be marked with masking tape as a permanent record for later reference. Some customers may not appreciate seeing their shoes stuck with needles.



67 Some soling materials and lifts can be so hard it is necessary to drill a small hole through the shoe first before inserting the needles.



68 Both techniques are very useful.



69 Once a customer gets a custom made shoe lift just right, they want it to be replicated perfectly.



70 Therefore, you can see that the tools just pictured are necessary for some specialty footwear fabrication processes.



71 Ditto.



72 Ditto.



73 The right boot is for a customer with an amputation. The customer wants a walkable dummy front. This dummy is made from "mud".



74 This is the finished pair of work boots.



75 This is a very intricate way to make a pair of boots without a full length and solid heel wedge. The customer wanted horse riding boots which would accommodate the stirrups.



76 I wanted to use a one piece premade soling so that the heel could not separate and come off. I started by making a plaster impression of the bottom of the soling on a flat glass surface because the soling is contoured.



77 Notice the parchment paper used between the plaster and the glass.



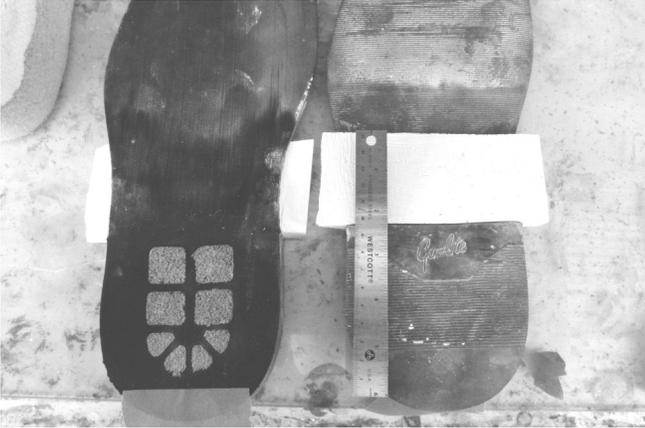
78 The parchment paper has been removed and the soling cleaned.



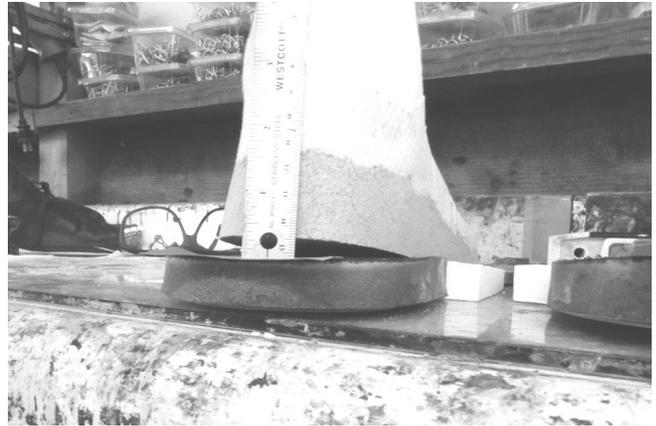
79 The plaster forms have been sanded clean and to the size I want.



80 The soles and plaster form have been turned upside down for a bottom view.



81 The plaster forms have been sized again by more sanding.



82 Now you can see the disparity between the contoured soling and the flat "mud" bottom.



83 This picture is to give you a different angle of view from the previous picture. You can see that something needs to be sanded out or filled in to make the two surfaces match.



84 I leathered the boots and added a filling mid sole to make up the contour differences.



85 Actually, I put in a uniform thickness midsole and then added a small heel wedge filler.



86 A little different angle of view.



87 A view from the other side.



88 A side view.



89 Another side view. Imagine the ruler as the flat walking surface.



90 A medial view with tools: level, small ruler, square with ruler and plaster forms.



91 A lateral view.



92 Another medial view.



93 The finished riding boots.



94 Ditto.



95 Ditto.



96 Ditto.

There is a lot of opportunity to be creative in making your own molded shoes, boots and sandals.

You can do things differently than I have done.

Try to think out the process you want to follow.

If it needs adjusting as you proceed, just make the changes you think will be better.

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This customer had congenital anomaly. She was born with deformed feet. She lived with this problem her whole life. This old pair of MURRAY SPACE SHOES served her well for many years.

Knowing that her feet had changed with age, she wanted a new pair from a new cast. She wanted the new pair to be lighter and as perfect as possible.

I started by photographing the old pair of shoes which she needed to take home to use while I made the new pair. I measured the internal heights in the base of the old shoes by using four upholstery needles (one at each ball and one at each heel) which I marked and saved.

I applied the standing vertical string and cast her sitting in a chair. I paid very close attention to her alignment.



97 Please put your thoughts into observing this old pair of shoes. Realize that the customer wanted the new pair to be updated and better.



98 Just observe.



99 Ditto.



100 Ditto.



101 Ditto.



102 Ditto.



103 Ditto.



104 Ditto.



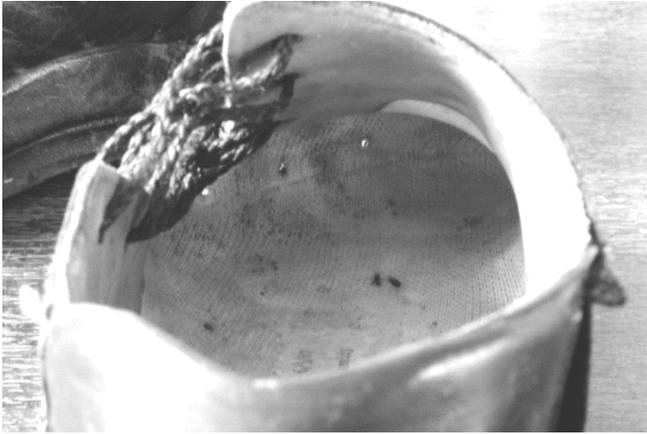
105 Ditto.



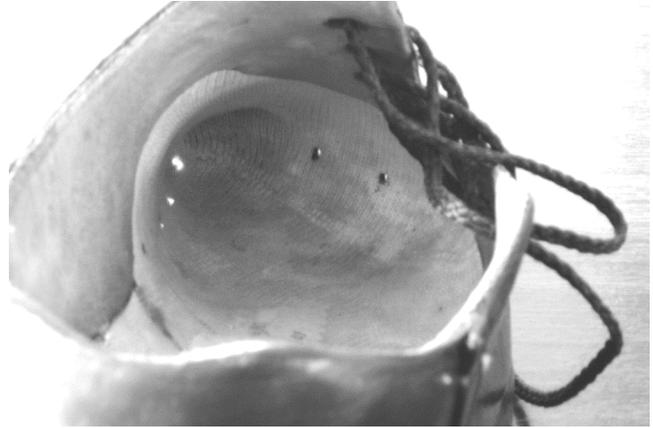
106 Ditto.



107 Ditto.



108 Ditto.



109 Ditto.



110 Ditto.



111 Ditto.



112 Ditto.



113 Look at my raw (un-cleaned) casts. Notice that the right knee could not flex properly while sitting. I will have to make some adjustment to the cast when turning it into a last. Take your time and look at these pictures with level and ruler.



114 The decisions to be made are: How to balance and determine the proper ways to improve the lifts of the old shoes which she said had begun to hurt her feet.



115 Ditto.



116 Ditto.



117 Ditto.



118 These five pictures are a repeat of the sequence above. The light is a little different. I want you to look at the casts again because the decisions to be made are not only a challenge but they are very important to the wearer.



119 Ditto.



120 Ditto.



121 Ditto.



122 Once, I finally decided what measurements would be correct, it was a relatively easy pair of shoes to make. The customer was very, very satisfied and there were no adjustments needed.

This next set of pictures are of a different kind of challenge. This customer was diabetic and had come to me maybe ten years previous. I had made shoes and they were very successful. The customer was very pleased. But, his medical condition worsened. The doctor did a partial amputation.

The doctors recommended a traditional orthopedic/therapeutic shoemaker and the result was terrible. The orthopedic/therapeutic shoemaker worsened the gentleman's gait to where he could not walk in comfort.

The customer came back to me and asked what I could do. I looked and we talked. I said my philosophy about boot making is different. Let's just start over, but no dummy front on the right boot. He agreed.



123 This is the right shoe I made for the right foot with the amputation. It worked fine. The customer made one modification and that was to use two separate laces so he could tighten the boot better.



124 This pair of boots served him well for a couple of years and then he had a little more surgery on the foot so he came back to me again. He wanted a new pair from a new cast. That is when I got this set of pictures.



125 These pictures tell a lot about the body structure and balance issues. The fact that he has fairly good balance when wearing the MURRAY SPACE SHOE® boots is incredible.



126 These boots have really served this customer well.



127 As you can see, the wearer puts almost all his weight on the left boot and pushes laterally with the front of the foot. Therefore, the lateral left front bulges outward from the foot rotating at push off.



128 The stump boot is a real stump, but it really works. The customer doesn't trip and fall. The customer is very happy with this short boot for the partially amputated foot. This is the medial view of right boot.



129 Lateral view of right boot.



130 Medial view of left boot.



131 Lateral view of left boot.



132 I have taped on the standing vertical string before casting for the second pair of boots.



133 This is the second pair of boots. The customer said they were better than the first pair of boots. He is happy and he can walk without a cane.

The following set of pictures is for another customer with a congenital anomaly. He wanted an exact duplication of a pair of old MURRAY SPACE SHOE®S which were in perfect condition inside and outside. He had been wearing MURRAY SPACE SHOE®S for many, many years and his feet had not changed.

The lifts of both shoes were very different so I used four upholstery needles to measure the bases of the old shoes. Then I taped the old shoes and poured a new cast from them.

After taking the cast out of the old shoes, I transformed the casts into lasts in order to make a new pair of shoes.

The customer wanted the old traditional style of MURRAY SPACE SHOE®S with "mud" and cord bases.



134 The specialty technique shown here is the use of little blocks which have been measured by the use of the upholstery needles with the old shoes.



135 The measured blocks at the ball and heels are placed in the same location as the needle measurements. This is a top view so you can understand that when the base is finished, the blocks will be the base height measurements.



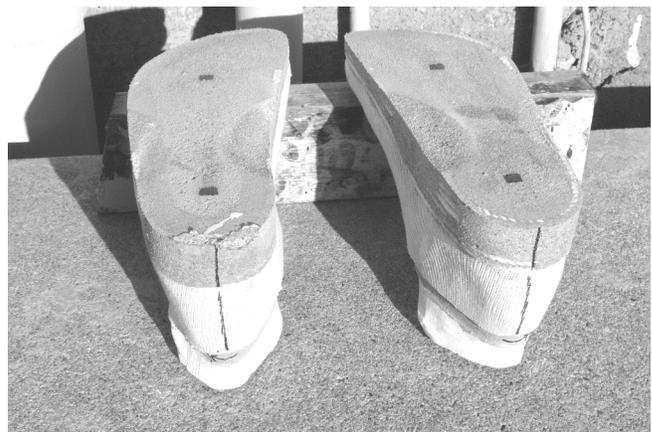
136 The shoes have been "mudded" and are drying.



137 Another view of the drying "mud" base.



138 A back view of the "mud" base which needs to be sanded.



139 The fully sanded and leveled "mud" bases with the measuring blocks showing exactly where to stop sanding. The back right heel has a little new "repair" "mud" which needs to be sanded. The vertical lines at heels are for visual reference.

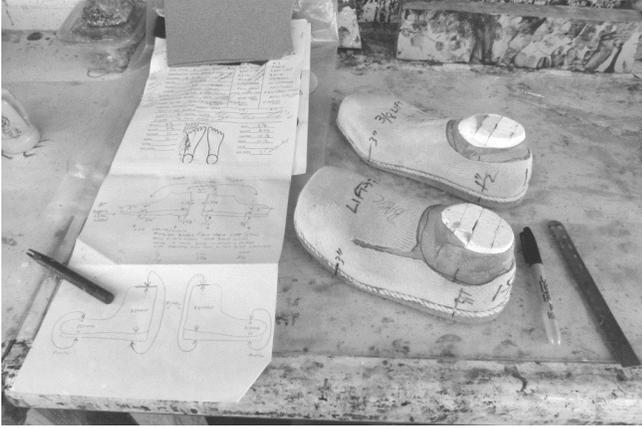


140 The shoes have been leathered, soled, and cleaned up, polished and are finished. They only need laces and the wearer.

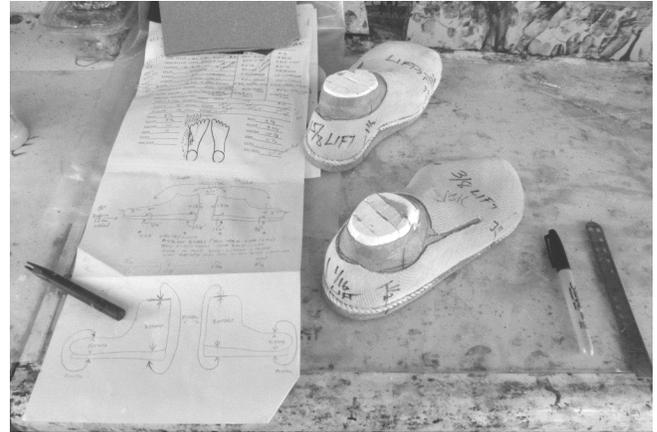
The next set of pictures are for another old MURRAY SPACE SHOE® customer who required very complex lifts for both shoes.

The customer wanted the lightest shoes possible but with the old style traditional MURRAY SPACE SHOE® design. Therefore, I choose to make the lifts with granulated sheets of cork.

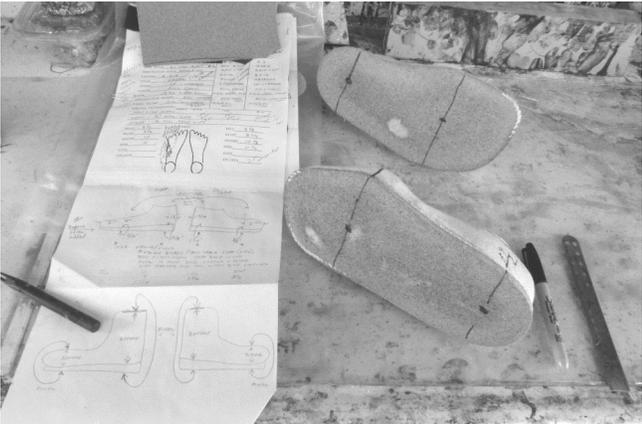
Again, I had to take all the measurements needed for the making of a new pair of shoes. I returned the old shoes and proceeded to make the new pair without having a model to observe or being able to use in the making of comparisons.



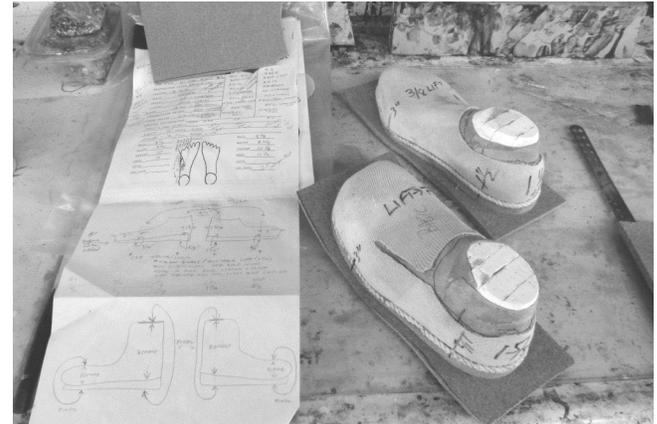
141 Notice the drawings so that I could know what to do, how to replicate the old shoes and make any new improvements if necessary. This new pair of shoes was made from a new cast.



142 Because of the complexity of the lifts, I marked everything on the shoes in process so I could observe and measure whenever I needed to do so.



143 Ditto.



144 These lifts are made by building up layers of granulated sheets of cork. The cork is very easy to shape by sanding.



145 As I proceed in the construction process, I mark the necessary measurements and keep re-checking. These layers of cork are ready for sanding.



146 The cork has been sanded and measurements remarked.



147 Ditto.



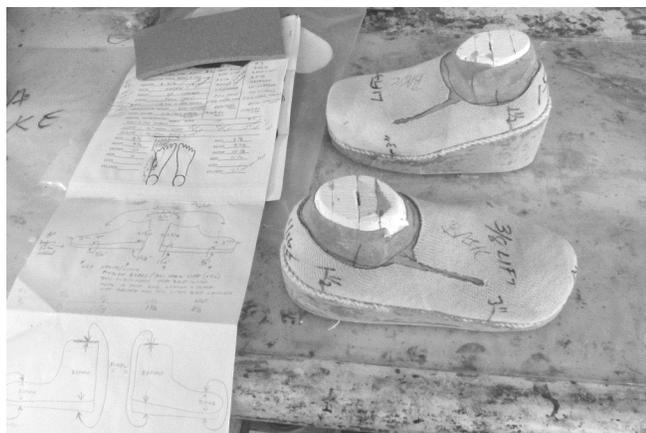
148 Ditto.



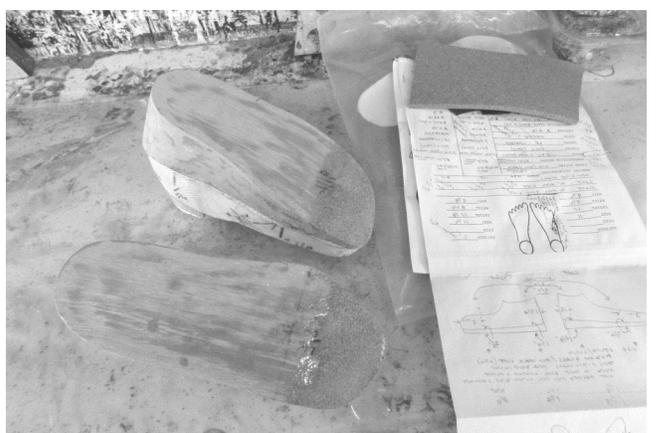
149 Fiberglass resin has been applied to the outside and bottom of the corks from ball to heel to give strength to the outside of the cork.



150 Ditto.



151 Ditto.



152 Ditto.



153 Shoes just before leathering.



154 The finished shoes.



155 Observe the lifts.



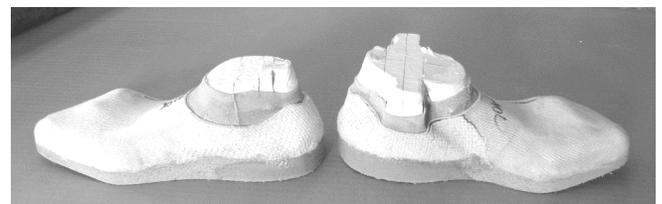
156 If you learn the basics of fabrication and apply your own talents, you can do this kind of work too.

I don't like to work with braces, either metal or plastic. The plastic is the worst to work with because the fit is generally so poor it compromises the footwear. When footwear is made properly, additional bracing is not always needed and it can interfere with gait.

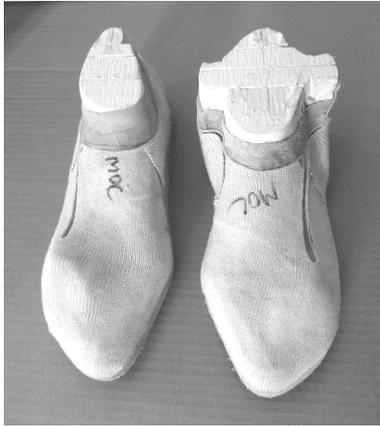
Since I am not a brace maker, I prefer to not get involved with someone else's work.

The work in this sequence of pictures is something I just don't do, except a customer of 30 years with the Murrays and over 30 years with me, asked me to make a pair of shoes for his new brace. I thought it would be disrespectful to say "No". So, This is what I made.

I casted him with the brace on so that the cast included a reproduction of his foot and the brace.



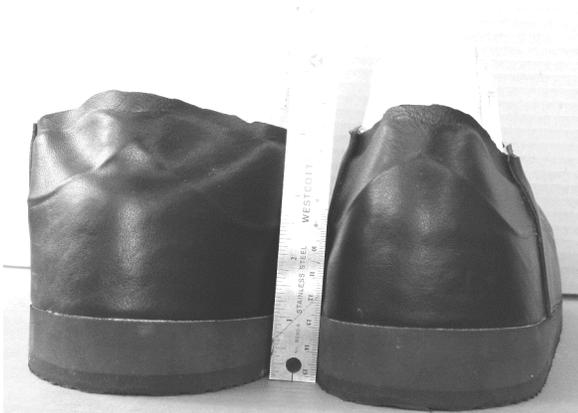
157 This is the pair of shoes just before leathering. Notice that fiberglass resin was applied around lower heel areas with a little more under brace.



158 Top view from front.



159 Top view from back.



160 Back view. Because the brace has thickness, I lowered the heel on the left or raised the heel on the right to produce an even left/right balance as he walked.



161 The finished shoes. The result was pretty good. But, I did have to make a small tuck in the side seams of the left shoe to tighten it just a little.



162 The customer said he was satisfied, but wished he didn't have to wear the brace.

The artisan and/or craftsperson has to be careful with specialty footwear. Only take on what you think you can do well enough to satisfy the person who is requesting your work.

Don't let someone's complicated request or needs intimidate you. Let them know what you think your capabilities are ahead of time.

Good communication and cooperation is necessary in order to satisfy people with special requests and needs.

I don't like to work with braces! I was surprised this one was ok.