CAST MODIFICATION

CHAPTER 21

CHECKING CAST MEASUREMENTS

CHECKING CAST MEASUREMENTS

The hand held tape measurements that were taken at the time of casting, were not necessarily precise.

The vascular system, the lymph system and the muscles can all change those measurements very quickly.

The feet are dynamic and they are always moving just like the rest of the body.

It doesn't mater how you measure the feet, the result is always arbitrary. We are dealing with the living human body, not a static object.

The purpose of using measurements is to take some of the guesswork away, and to help establish some references that may be useful to the artisan and/or craftsperson.

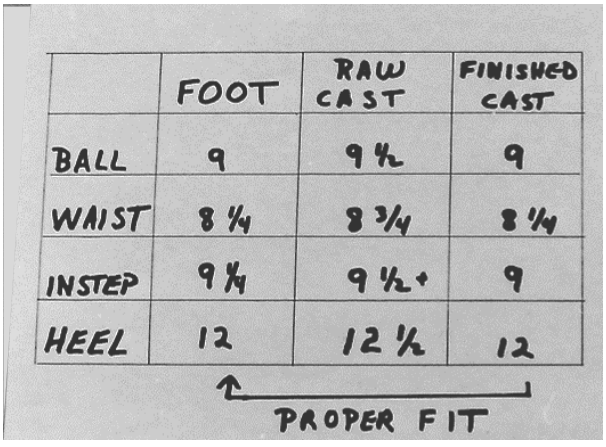
Measurements do help to build confidence; they refresh the memory, they aid the observation processes and they contribute to thinking and decision making.

Use the measurements taken before casting as a guideline for starting your evaluations of the person's feet and the casts that were taken. You can adjust the guidelines anytime your observations indicate a modification.

Producing properly fitting footwear is the important criteria and goal.

You can recheck the measurements at any time as you go through the cast modification processes.

You should also recheck these measurements when you are finished with the cast modification processes so that you understand the changes that have been made.



1 This chart is typical of what happens to the measurements taken of the feet, taken of the raw (unmodified) cast and the finished (modified) cast which has become the last for the making of the footwear.

Important customer information from the worksheet:

Age

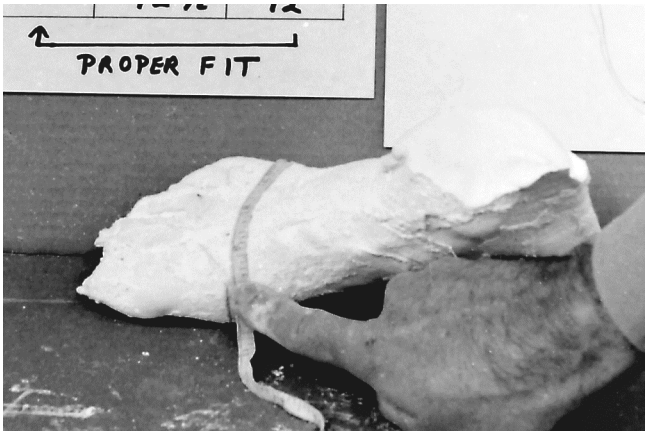
Height

Weight

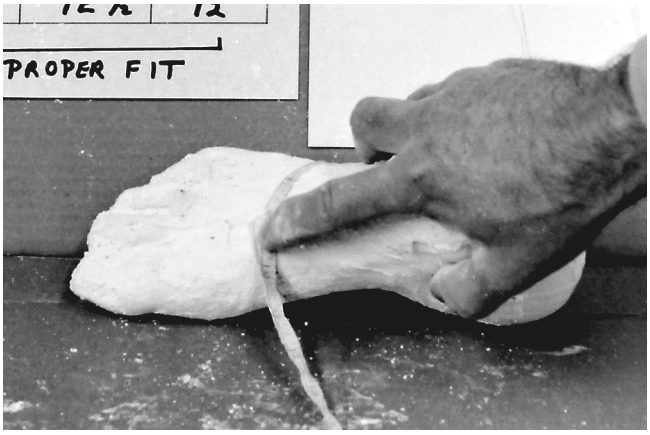
Gender

Problem areas of feet.

2 The information about the customer or client that is put onto the worksheet will be helpful to the person who does the cast modifications. That information will guide the direction and amount of modifications necessary to achieve a proper fit.

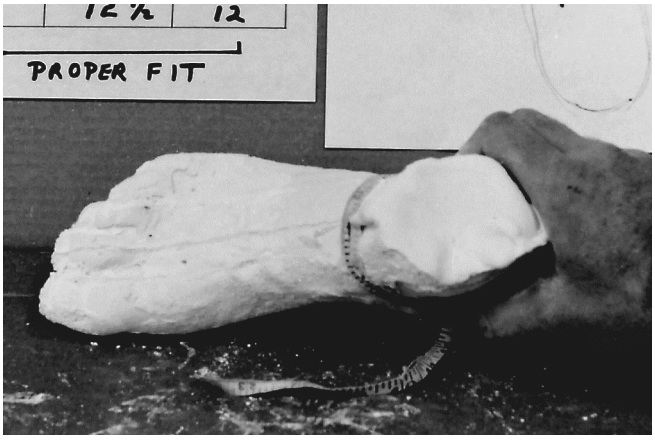


3 Measuring the ball of the foot.

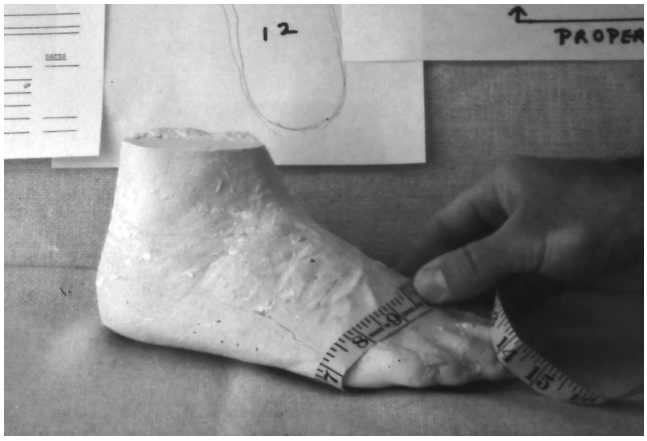


4 Measuring the waist of the foot.

5 Measuring the instep of the foot.



6 Measuring the heel of the foot.



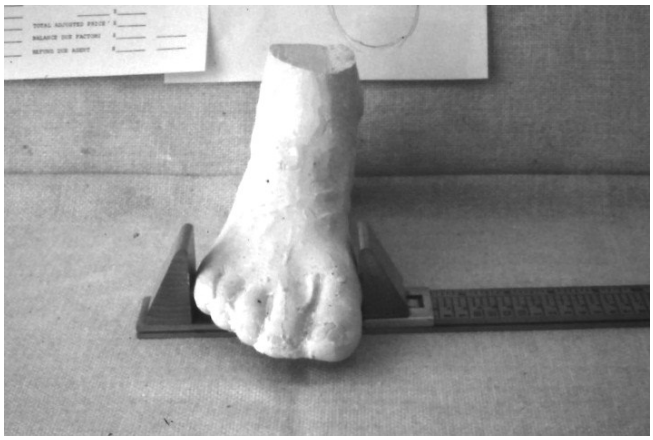
7 Lateral view of measuring the ball of the foot.

8 Lateral view of measuring the waist of the foot.

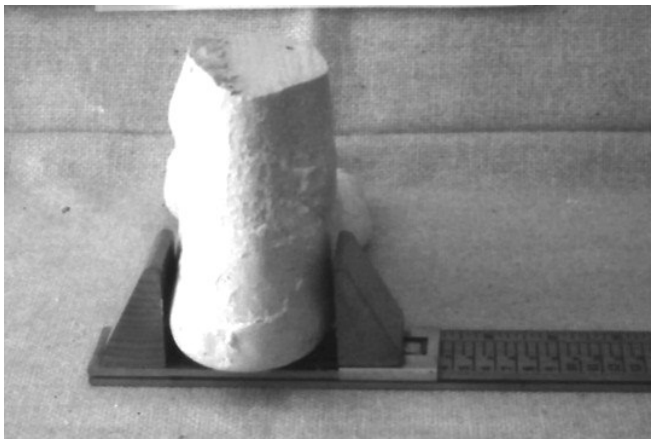
9 Lateral view of measuring the instep of the foot.

10 Lateral view of measuring of the heel of the foot.

11 The Ritz® stick can help with the measuring of the length of the foot.

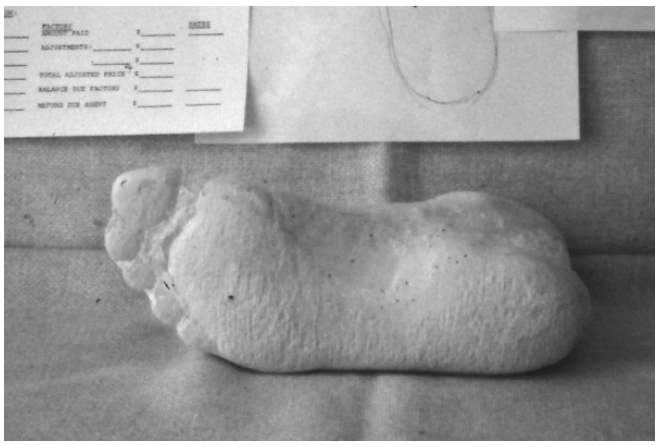


12 The Ritz® stick can help with the measuring of the width of the ball of the foot.



13 The Ritz® stick can help with the measuring of the width of the heel of the foot.

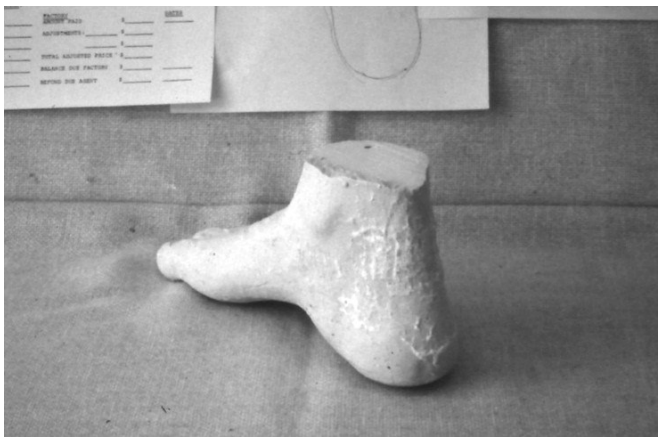
14 There is no way to appropriately measure the arch. You have to rely on visual observation and memory.



15 Ditto.

16 The same applies to the lateral side.

17 The same applies to the medial side and bunion joint.



18 Ditto.

19 The same applies to the little toe joint etc.

20 The same applies to the back shape of the heel bone area.

LEARNING TO MAKE YOUR OWN MOLDED SHOES, BOOT AND SANDALS

In order to fit the shoe to the foot, we take a plaster cast of the feet. The cast is used to make an accurate as possible reproduction of the foot around which we can mold a shoe, boot or sandal, fabricating from the inside outward.

Casting of the feet is an art and craft which requires the application of proper technique. Because each person and each foot is unique, best results are obtained when the artisan and/or craftsperson does the casting of the feet. However, self casting is not very practical. Therefore, you may wish to teach someone how to cast your feet.

When learning to make your own molded shoes, the most important knowledge is the learning of how to best capture the three dimensional sizes and shapes of the feet, and how to modify the cast to make the best possible model (last) around which you will build your shoes, boots or sandals.

Hint: the cast is static but the foot will function dynamically as the foot moves in every activity.

Once the last (model) is correct, the process of making shoes, boots and sandals can be varied in design, selection of materials and ways of fabrication.

The SECRET of molded shoes is in the modification of the cast. There is no one standard measurement of modification which will fit everyone. This is an art and craft which is unique to each individual and each foot.

The making of your own molded shoes, boots and sandals is a true expression of your artistic and crafting abilities.

UNDERSTANDING THE USEFULLNESS OF CAST MEASUREMENTS

Now is when you make the major decisions that will shape the footwear you are going to fabricate. These decisions are so important because they are the most important work of the artisan and/or craftsperson who is turning the cast into the last.

The last is merely the inside shape and size of the shoe, boot or sandal to be fabricated. If you don't get the modification of the cast into the last accomplished pretty decently, the fabrication processes can end up to be a waste of time, energy and materials.

Because most people don't understand and know how to change a cast into a last, they really can't make good molded footwear.

Yes, experience is the teacher, but every student, artisan and/or craftsperson had to start sometime. If they could succeed, so can you!

Just think about what you want to do, how to do it and start doing it. The success of your results might surprise you.

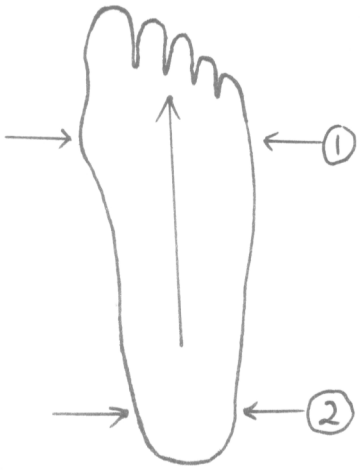
The whole process starts and ends with measurements. Measurements are your reference points forward and backward as you progress to accomplish your goal.

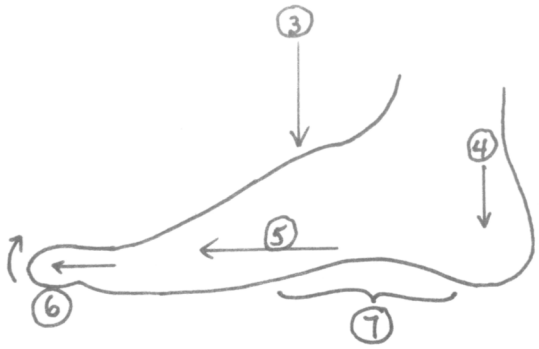
RAW FOOT FUNCTION

These are basic starting points. The artisan and/or craftsperson must combine a working knowledge of how a raw foot functions with expectations about how the individual foot of the person casted is going to function.

The expected changes associated with a functioning foot must be incorporated into the shoe, boot or sandal last before fabrication is begun.

These seven basic areas of consideration are just the usual areas of concern. Every other area of the foot, ankle and lower leg, may also have major importance for a particular cast and last.

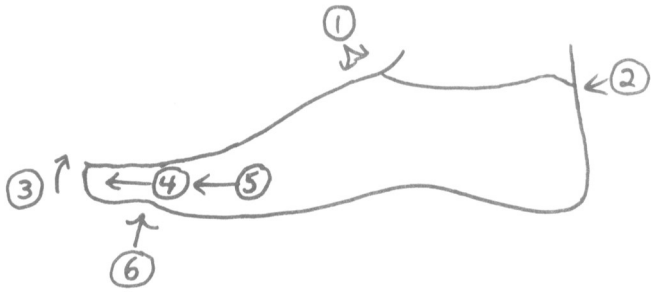




Area of foot	More weight bearing	Less weight bearing	Shoe fabrication consideration
1) Across ball	Expansion in width	Contraction in width	Containment to hold shoe on but without causing excess pressure.
2)Across heel	Expansion in width	Contraction in width	Containment to hold shoe on but without causing excess pressure.
3)Over ball and instep	Reduction in height	Increase in height	Reduce height of cast and bring to rear slightly.
4)Top of heel below ankle joint	Reduction in width	Increase in width	Bring sides of shoe closer together on top.
5)Heel to toe length	Elongation	Contraction	Provide necessary inner length.
6)Movement of big toe	Tends to move forward and/or up	Tends to retract	Provide adequate length and extra room on top.
7)Arch	Drops down and flattens	Move back up to natural position	Provide flexible cushion and correctly contoured support.

FUNCTIONAL CONCEPTS OF CAST MODIFICATION

Once the proper cast to last modification has been achieved, the proper fitting shoe, boot or sandal can be fabricated. So. Let us develop an understanding of the basic concepts necessary for developing proper shoe design through cast modification.



Part of foot	Movement	Compensating footwear cast design
1)Extensor halluces longus tendon	Upward as the big toe flexes	Splints over top of cast when necessary.
2)Calcaneal tendon	Outward as ankle is moved	Scalloping of the top of back of shoe.
3)Height of big toe	Upward lifting	More room over nail area.
4)Length of toes	Forward	Addition of proper length approximately to 1/2" through size 10 or 11 then to 3/4".
5)Length of ball	Forward	Addition of proper length approximately to 1/2" through size 10 or 11 then to 3/4".
6)Crest or pyramid on bottom between toes and ball	Forward	Little crest = no movement but fill in under 1st + 5th toe. Average foot = female needs 1/8" of forward placement, Average male needs 1/4" of forward placement.

There are only two methods of evaluation of the cast/last. One is visual observation and memory. The other is measurements. The measurements are tangible and recordable. Therefore, we will proceed and develop this art and craft by using measurements whenever possible in our explanations.

THE BASIS OF CAST MODIFICATION

CAST REDUCTION CUTS

Please note that the number of cuts is influenced by the width of the saw blade. Saw blade thicknesses vary greatly so you will have to make some decisions. I use wider saw blades for bigger feet and narrower saw blades for smaller feet. I also vary the width of the saw blade based on how skinny or fat the person may be.

Wrap casting generally requires a slightly thicker saw blade for cutting than does the old traditional plaster casting method. I think the wrap cast form swells slightly in the pouring up process. Especially around the top opening (ankles) and where the heel came out.

Basic shoe styles for men = 1 horizontal cut and 1 vertical cut

Basic shoe styles for women = 1 horizontal cut and two vertical cuts

Shoe styles with center tongues need 5 plaster splints on top of the vamp (waist to instep)

Shoes for extra flat and long and overweight people may need an extra vertical cut and sometimes more if they are really flabby and full of water.

Sandals are done the same as basic shoe styles except that they need an additional cut, called a center cut. This cut effectively narrows the whole cast.

Boot requirements vary based on style, number and thickness of socks to be worn etc. Generally, I use a horizontal cut and fewer vertical cuts because of the use of thicker tongues and socks. Sometimes I will add an extra removable insert of 1/8" to compensate for thicker socks and then add additional toe length too.

There is no substitute for experience. Every time you make a new pair of shoes, boots or sandals, you will learn more about what to do better on the next pair.

I think every artisan and/or craftsperson struggles with the learning process of cast modification for molded shoes, boots and sandals. I still have to think about the wearer and the measurements.

The following is my personal opinion:

Please note that proper accommodation is an acceptance of what the person casted and the cast presents. Accommodation is not a correction of any persons physical problem. But, accommodation may include adjustment of a cast for imperfections of the alignment of a casting.

This may be a fine line of the separation of definitions, but the wearer has the right to not wear the footwear, request an adjustment be made, request a remake or even request some refund of payment.

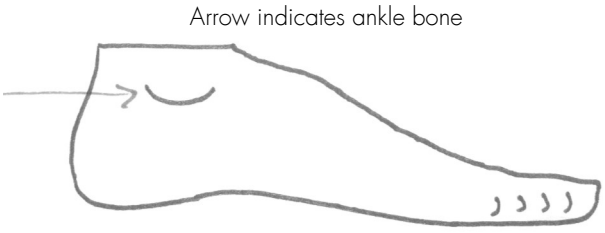
The artisan and/or craftsperson should not demand that a wearer must wear something which the wearer feels is incorrect. Only the wearer can be the judge.

Molded footwear is not for everyone. And, not every artisan and/or craftsperson is going to be able to make footwear for everyone. But if you want to try, always do the best you can!

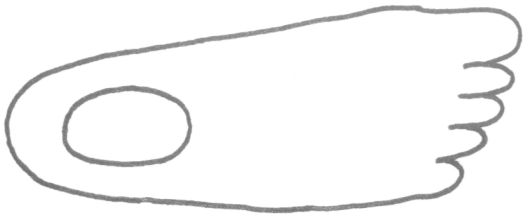
THESE DIAGRAMS REPRESENT THE GENERAL PROCESS FOR THE ORIGINAL AND PRESENT METHODS

THE RAW CAST

Medial (inside) view

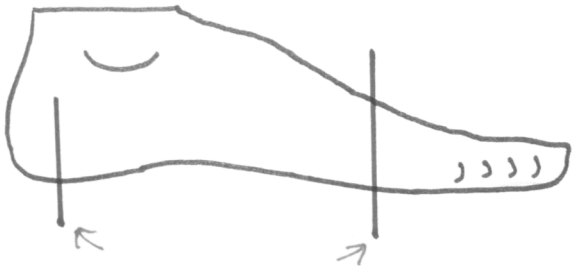


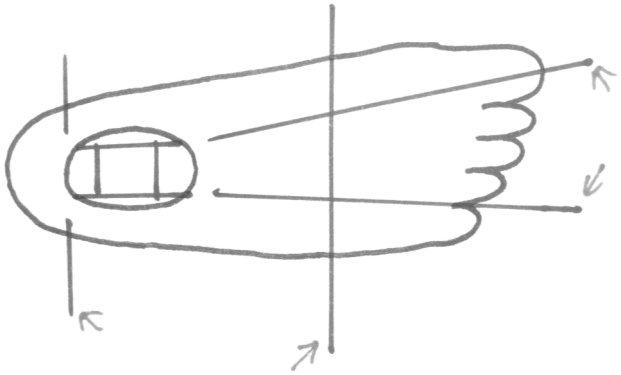
Lateral (out side) view



Superior (top) view

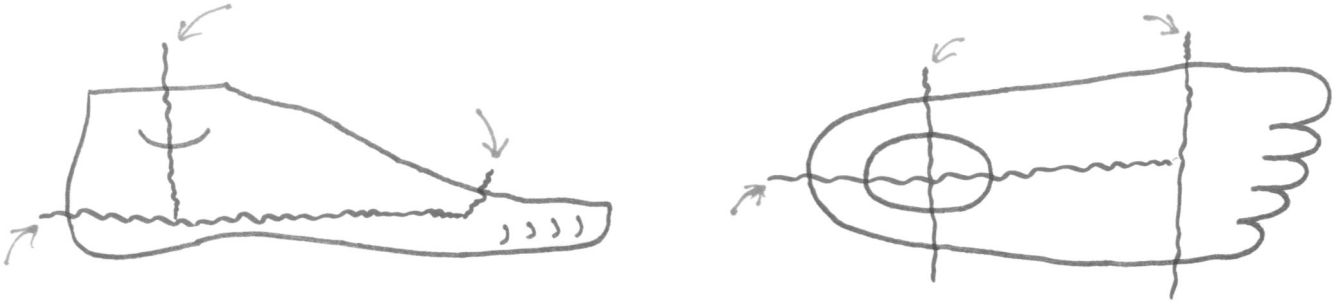
FEMALE CAST MARKINGS AND CUTTING





Arrows point to long straight lines which are markings made with an indelible pencil to be used as guidelines.

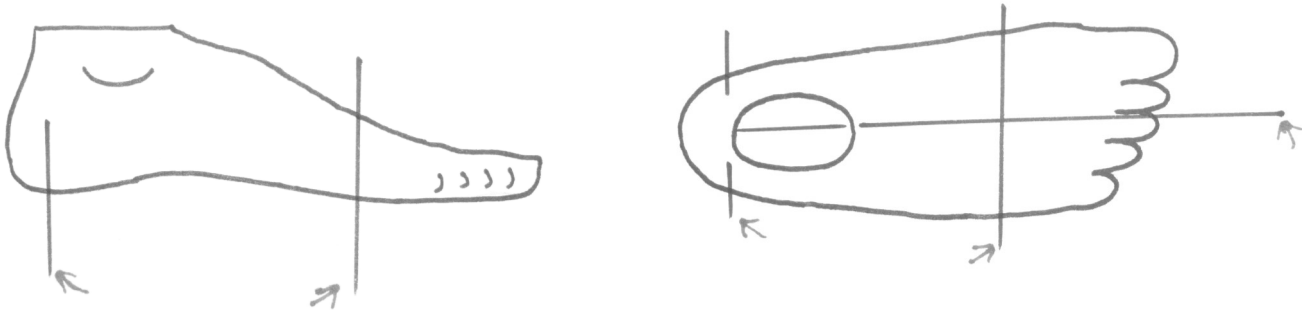
These lines are exaggerated for these illustrations.



Arrows point to squiggly lines which represent saw cuts usually made with a hand dry wall saw.

These lines are exaggerated for these illustrations.

MALE CAST MARKINGS AND CUTTING



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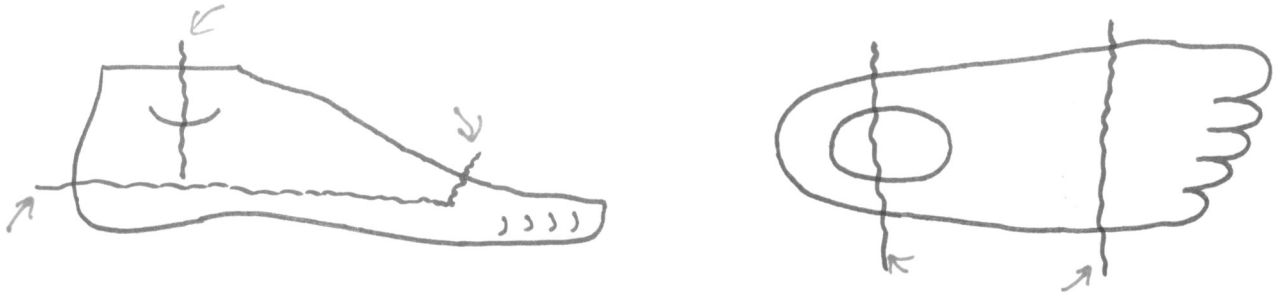
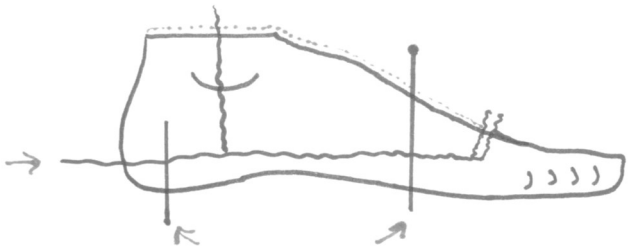


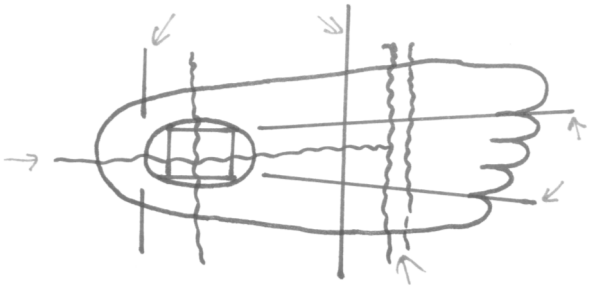
Arrows point to squiggly lines which represent saw cuts usually made with a hand dry wall saw.

These lines are exaggerated for these illustrations.

AFTER CUTTING PROCEEDURES

After the cut pieces of the cast are scraped clean and irregular saw marks are removed, a small amount of press cement or similar glue is used to glue the pieces together with the aid of the pencil guide marks for lining up the parts.

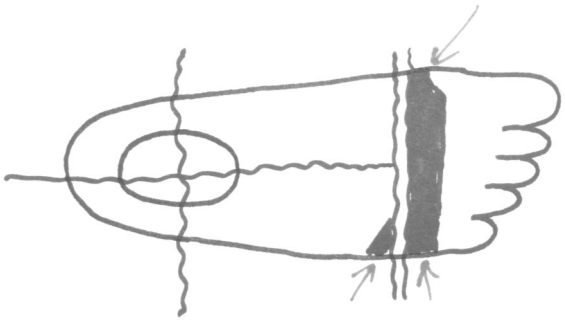




The arrows point to the pencil marks which must be aligned. Notice that the top pieces have been lowered the width of the saw cut. The front top piece has moved backward the width of as many vertical saw cuts as have been applied. Therefore, there is a gap at the front of the top piece which must be filled later. The front semi-vertical cut was made behind or to the rear of the mid point of the bunion joint . The back pieces at the heel should match flush.

Some shaving of excess plaster is required which can be done manually with a knife, file and grill paper; or on a sanding machine using a wire brush. The purpose of the shaving is to lower the height of the area behind the toes without cutting down the bunion joint entirely. And, then to proceed around the entire cast to eliminate protrusions left by the reduction in size of the top of the cast.

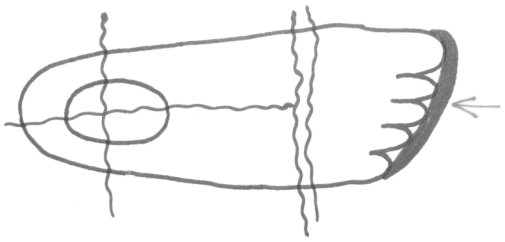
The arrow and blackened area indicate the area to be shaved.



Continue to clean up the cast by taking off all excess plaster not common to the true form of the foot. Smooth up the rough spots of the cast and slightly trim the inside and outside (medial and lateral) of the heel area below and to the rear of the ankle.

Taper this area so that more is taken off as you go higher from the sole of the heel. Be more aggressive with cast of people with narrow heels compared to the rest of the foot, long thin feet or for shoes made of very thin and soft materials which might stretch. Also, remove plaster around the Achilles tendon above the top of the calcaneus bone at the top of the back of the shoe.

ADDING PLASTER SPLINTS TO TOE AREA



The amount of splints required for each individual foot varies for each individual person, style of shoe, boot or sandal, materials to be used in fabrication, size of person, gender, physical condition and activities or lifestyle.

These guidelines are derived from general and common usage

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ORIGINAL CAST CUTTING AND MODIFICATION

Regular — 15 splints or approximately 3/16"

Additional — up to 25 splints or approximately 5/16"

Extra additional — up to 30 splints or approximately 3/8" usually only for sandals and maybe boots.

New shoes from pour-ups of old shoes and re-leathers add 5 splints.

Some reworking and alterations might use up to 15 additional splints added to pour-up if required.

PRSENT CAST CUTTING AND MODIFICATION

15 splints is generally considered to produce short shoes

20 splints would be for small feet

25 splints would be for average feet

30 splints would be for larger than average feet

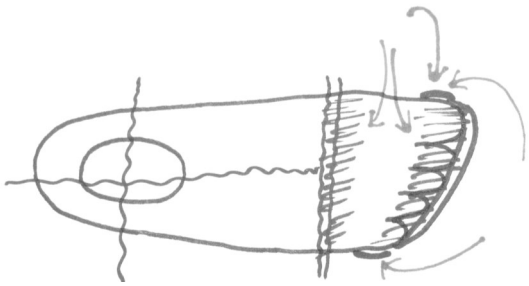
More than 30 splints would be for big feet

New shoes from pour-ups of old shoes and re-leathers add 10 splints.

Some reworking and alterations might use up to 30 additional splints added to pour-up if required.

ADDING PLASTER

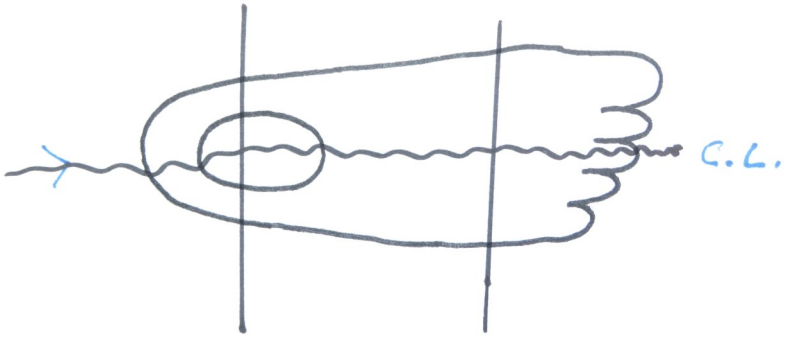
Add plaster to fill in the splint area. Make toe area uniform and rounded as desired. Make sure each particular toe is going to be accommodated by enough space inside the footwear. That means adding additional plaster for areas of toe movement where appropriate. Check proper filling of pyramid or toe crest on bottom so that not too much and not too little plaster has been added. Check calluses, bunions and corn areas. Check for big toe room for toe lifters. Check for little toe room. Check for underneath and over top of hammer toes and any other special and sensitive areas where relief might be needed. Fill in area where the cast cutting left a gap behind and on top of the ball of foot.



CENTER CUT

Usually made for sandals but can be used on any molded footwear style regardless of gender. The purpose is to narrow the whole length of the cast.

Squiggly line represents center cut usually made at center line of cast.



BALL CUT

The ball cut is usually the last modification that is made to the cast. Normally, all other modifications have been completed as well as all the plastering. The purpose is to lengthen the cast specifically at the ball of the foot because this is an area of elongation. The ball cut is generally used on males over size10. Sometimes it is more prudent not to use a ball cut because the foot will not elongate.

Commonly used splint patterns for ball cuts take into consideration the amount of toe splints also used. Normally, the toe splint/ ball splint pattern does not take into account extra splints which need to be applied at the ball to compensate for the width of the saw cut.

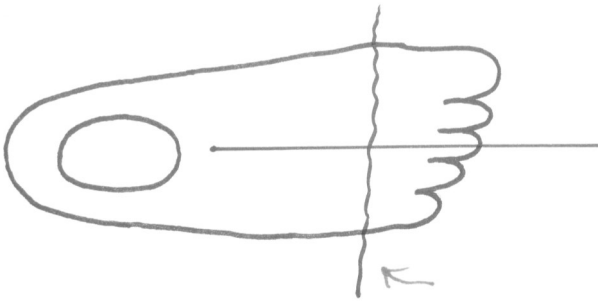
15/10 or 10/15 for medium size feet (male size 10)

15/15 to 15/20 for large size feet

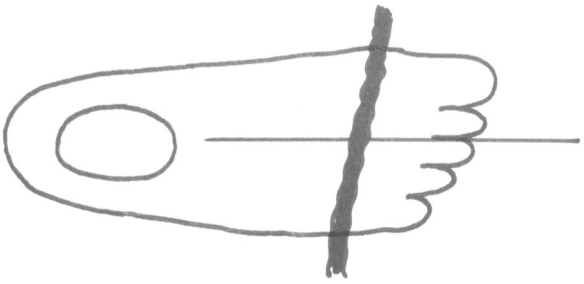
15/25 to 20/20 for extra large size feet

Work boots can be 5 to 10 splints longer than casual shoes.

Ball cuts can be used for large female feet or whenever extra long elongation is expected as with sandals.



Squiggly line represents ball cut.



Darkened area represents plaster splints used to fill ball cut. Usually the plaster splints need to be trimmed with a single edge razor blade and plaster is applied to fill in voids.

ONCE THE CAST MODIFICATIONS ARE COMPLETE, THE FINISHED CAST BECOMES THE LAST!

Now is a good time to go back and re-check measurements, look at the elongation drawing and look at the worksheet to see if anything was not taken into consideration, or needs to be changed.

If all is in order, the next step is fabrication of the shoe, boot or sandal.

Hopefully, you are working with a pair of lasts so you can make a pair of shoes, boots or sandals.

Checking cast measurements is important because modifying the cast into the last is the most important step in the whole molded shoe making process.

I sincerely hope the next five chapters will help you to understand the process enough to get started.

I also, hope you become very successful at making your own molded shoes, boots and sandals.