

## CASTING METHODS & SPECIALTY FOOTWEAR

### CHAPTER 11

### PLASTER CASTING



## Book 3 of 4 CASTING METHODS & SPECIALTY FOOTWEAR

A good artisan always observes everyone's gait and posture!

The artisan studies life!

Study anatomy (static and dynamic), study life sciences, observe, observe and observe!

Watch your subjects.

Look at how they stand, walk and sit, with and without footwear before you cast!



1 The right heel contacts the walking surface. The calcaneus or heel bone is offset to the lateral side at the back. This is good design and it is normal. We are bipeds.



2 The tailor's joint may contact first. The metatarsal arch quickly allows the weight to move through the ball toward the big toe joint. What you see here is the balance of weight being shared by the ball and heel.



3 The weight bearing moves to the ball and toe areas.



4 The heel lifts off the walking surface. The ball and toes are a marvelous balancing system. Along with the leg muscles, they are a wonderful propulsion system.



5 The left heel contacts the walking surface. The foot tilt to lateral is exaggerated slightly in this picture. The weight and balance usually go to the lateral or tailor's joint first.



6 The weight bearing is distributed across the metatarsal arch toward the big toe joint. This is where tight shoes cause a lot of internal distortion and can eventually create major foot and gait problems.



7 As the heel lifts off the walking surface, the weight bearing is moved to the ball and toes.



8 Notice the difference between flat weight bearing and dynamic movement portrayed in picture 9. The shoe must have enough length to accommodate the elongation of the foot and the flexing materials which do not elongate.



9 The measurement of circumference of two different size circles is not the same. The foot is the smaller circle. The footwear sole is the larger circle. Therefore, proper inside toe room is necessary because the foot is supposed to flex.



10 The tools and parts of the casting platform on which the foot rests in the plaster casting method. The 1/4" felt is placed in bottom of pan. The 3"X3"X5/8" heel block is placed on top of the felt so as to be under the heel bone. Moist sand, which is not shown, is shaped with the wooden sand shaping tool. See page 5 to view the completed pans of sand.

Mr. Murray originally used plaster to cast the feet. Plaster has advantages. It also has some problems. It is a mined resource and it is not pure until it goes through manufacturing processes that give it the qualities desired by the different trades that use the plaster. The main uses are for the building and industrial trades. It is not formulated to be used as a body casting material, although it has been used for that purpose for centuries. Today's plasters can set harder and hotter than those produced before the manufacturing techniques became so highly refined as they are today.

**Therefore, take heed of this warning! Plaster can cause extreme discomfort and burn your customers, friends and relatives. I don't recommend using this plaster process without learning from someone with body plastering experience. Just because I think it is important to know about and understand this original process, it doesn't mean I advocate your using this method without proper guidance. In fact, I recommend you play, experiment and use the wrap casting method portrayed and described in the next chapter.**

Yes, this method of plaster casting is very good when used by a skilled casting technician! If you study this method, you will learn some important concepts about how to correctly capture the measurements of the feet, ankles and lower legs in order to make good reproductions regardless of the materials used.

If the reproductions are good, the footwear to be produced has a good chance of being successful. If the reproductions are poor, the artisan and/or craftsman is going to have a very hard time trying to produce a mediocre product. My purpose in these books is to teach you how to make the highest quality footwear products you are capable of producing.

As a caster, you need to take time to observe and think about everything during the casting process. Your concentration and attention to the details of good casting techniques will make the fabrication a lot easier. Good casts will allow you to produce better footwear. You must be observant!

Body alignment and posture are critical to proper casting! Be nice to people and tell them how you want them to cooperate with your positioning of them. Listen to them. Let them tell you their idiosyncrasies. Listen before you make judgements. You are not going to correct or cure anything. You are going to work with the good aspects of the person you will be casting, and for whom you will be ultimately making footwear.

Theoretically, the joints of every person's body should be in alignment. When sitting in the chair, the feet should point straight forward toward the caster. This will give the highest natural semi-weight bearing arch. The feet should be 4-6-8" apart and even at the back of heels and the front of the toes. The ankles should be vertical over the feet, without pronation or supination. The knee joints should be vertical over the ankles. The knees should be strapped so they don't wobble. The hips to knees to ankles angle should be 80-90°, so the ankles are slightly back of the knee joint. The upper posture should be vertical without leaning forward or backward. The shoulders should be square and the head should be facing forward and level not down.

Good total body alignment is necessary for the making of good footwear. The future wearer has the responsibility of being able to present good total body alignment for casting with a few helpful hints from the observing casting technician. The caster should explain in simple and concise language what body parts should be better aligned and/or repositioned.

If good total body alignment is not possible, the caster, who is hopefully the footwear maker, must take note of the deviations in order to make compensations and/or adjustments to anything in the processes which may be beneficial to the wearer. The caster and/or footwear maker's purpose is only to make the best footwear possible. No attempt or intention should be made to correct or cure anyone's physical condition unless the caster and maker are a medical provider.



0 Look at the overall posture of the customer.



1 Compare these different customers. No two people are exactly alike. We may develop a standard protocol, but we can't treat everyone alike. Be respectful and learn to work with each person as a unique individual.



2 If you are going to use the plaster casting method, you better NOT FORGET to shave the hair off the feet, ankles and lower legs before you apply plaster. NO EXCEPTIONS! EVER!! Remember this warning. ALWAYS!



3 Each foot is carefully positioned onto a pan of moist sand.



4 The feet have been positioned onto the foot pans. The feet, ankles and legs have been aligned. The straps are being used to aid the customer in maintaining the proper alignment position.



5 Please refer to page 17 which is a copy of Mr. Alan E. Murray's directions for proper position and alignment of the person to be casted. Some people don't have good functioning body mechanics. Get as close to normal as possible.



6 Sand is sprinkled over toes and around base of feet.



7 A painter's brush is used to move the sand where it is desired and shape it as the artisan works the magic. The brush is also the clean up broom.



8 Ditto.



9 Drops of water are used to settle the sand between the toes.



10 A spoon is used to make an undercut area around the bottom of the foot. Then the spoon is used to move excess sand away so the plaster can flow easily under the edge of the foot.



11 Ditto. This is a very important step. Nice and neat work here will produce good results.



12 Ditto. It is essential to make the undercut area as perfect as possible. And, keep telling the person being casted to stay very still during this process.



13 Ditto. This is going to be the all important seam area between two different pours of plaster. The quality of this seam is going to be very important! The artisan of fine sculpture needs the seams to be good. The same applies to this casting.



14 Approximately 7 cups of loose and dry plaster is fluffed and placed into a pan. Then 1 1/2 quarts of COLD WATER is added. The COLD WATER helps to moderate the rise in temperature as the plaster hardens. PLASTER GETS HOT.



15 After about 5 minutes when the plaster has stopped bubbling, 1 table spoon of salt is added and everything is stirred together until a nice creamy consistency is achieved.



16 The left hand is comforting the toes and front of foot as the caster warns the customer "The plaster is COLD. Please don't jump or move your foot". Then the plaster is placed on the medial side of the ankle so it slides under the arch.



17 The plaster is placed around the back and lateral side of foot.



18 The plaster is placed on the front of the foot.



19 More plaster is added.



20 A collar is made around top of ankle with a "blunt" butter knife. The "blunt" butter knife goes thru the still wet plaster which is just beginning to firm. The caster applies just enough pressure on the "blunt" butter knife to go through the plaster.



21 The "blunt" butter knife barely touches the skin of the foot and goes all the way to the front of the pan separating the plaster. Not shown are two light side swipes made across the front to just tack the two halves of the plaster together.





22 The "blunt" butter knife is used again at the back from the top to the bottom to separate the plaster into two halves. Not shown is one light side swipe made across the center of the back to just tack the two plaster halves together.



23 At each corner of the pan a slice of plaster is removed.



24 Both corners have been removed.



25 The "blunt" butter knife is slid on its side just under the still soft but firming plaster and pushed upwards to make a tunnel for later separation of plaster pieces.



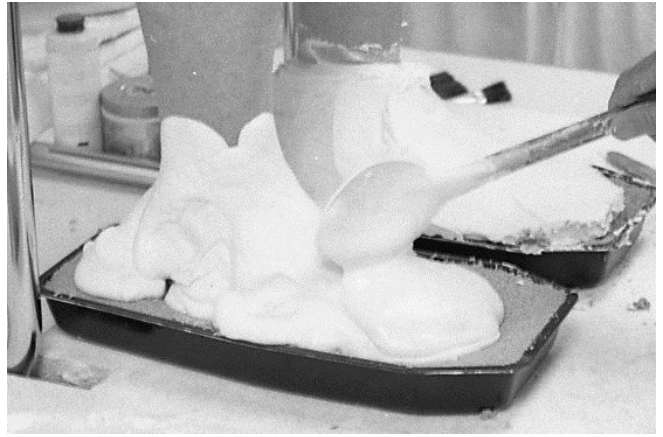
26 The plaster at front of pan has been cut off and the "blunt" butter knife is making another tunnel.



27 The same procedure of picture 25 and 26 is followed for the back of the cast.



28 The right foot is being plastered just the same as was done for the left foot.



29 Ditto.



30 Ditto.



31 Ditto.



32 Ditto.



33 Ditto.



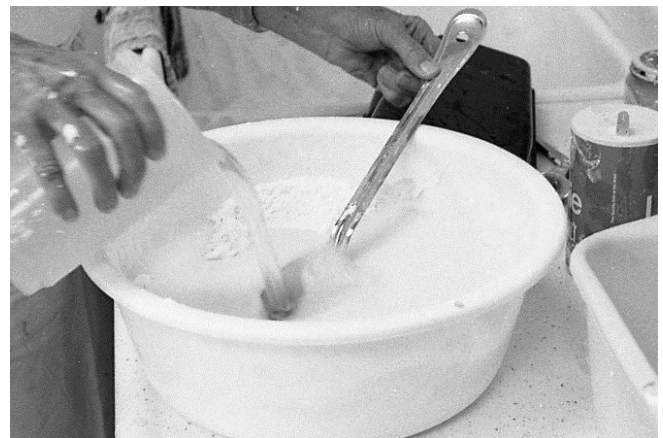
34 Ditto.



35 Ditto.



36 Ditto.



37 Approximately 5 cups of loose and dry plaster is fluffed and placed into a pan. Then 1 quart of COLD WATER is added.



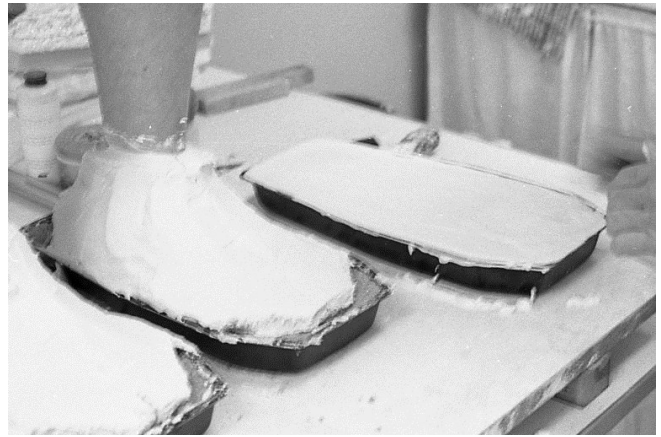
38 After about 5 minutes when the plaster has stopped bubbling, about 3/4 of a tablespoon of salt is added just before the stirring begins.



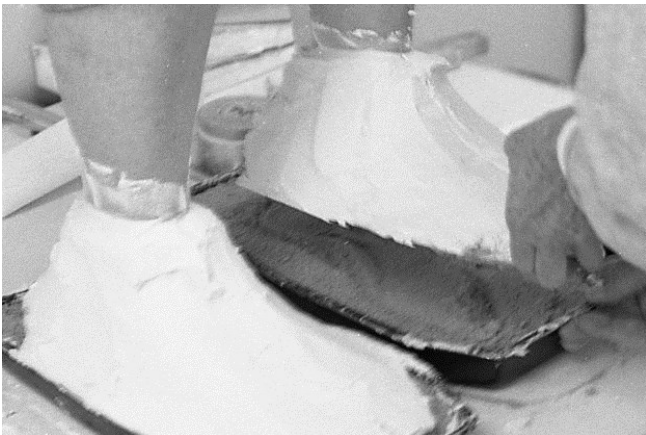
39 After stirring to a uniform consistency, the plaster is placed into a clean pan.



40 The bottom pan of plaster is stirred with the butter knife until it is just about ready to start firming. As shown in the picture, the plaster maintains a slight slump as the butter knife is pulled through the plaster.



41 The bottom pan of plaster is leveled by a slight shaking or lightly dropping one end of the pan on the table after raising the pan about 1/4 inch upward.



42 The caster tells the customer "don't move your foot, but help me by lifting your foot up and holding it up". This is where the perfect undercut becomes so important! If the foot drops down below the undercut the casting is no good!!!



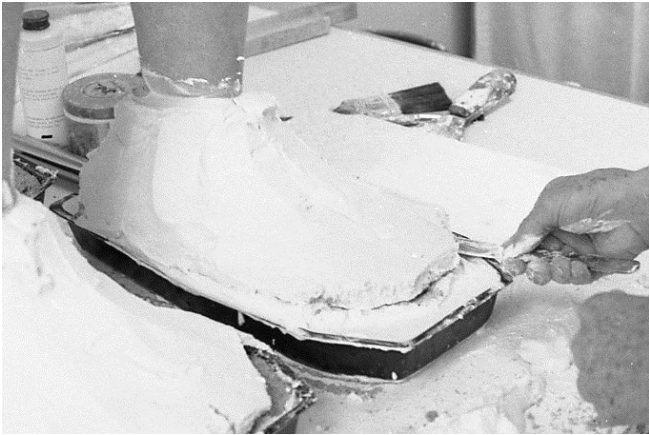
43 Tell the customer "keep holding the foot up and let me place your foot into the bottom pan of plaster". This method of plaster casting requires the customer to really cooperate. Some people just don't have the ability so getting good casts is hard.



44 The caster presses the top plaster into the bottom plaster and tells the customer to "keep holding your foot up for at least the next couple of minutes or so".



45 The excess plaster which squished out from under the top plaster, has been removed and cleaned away.



46 The butter knife is used to make ditches in the bottom plaster under the tunnels in the top plaster.



47 Ditto.



48 Let the bottom plaster set for a couple of minutes to firm.



49 Proceed with the lifting of the right foot top plaster.



50 Insert the bottom pan of liquid plaster under the top plaster.



51 Press the top plaster into the bottom plaster and look at that beautiful mess!



52 The mess is being cleaned up.



53 The ditches are being made in the bottom plaster.



54 Ditto.



55 Front view.



56 Front and side view.



57 After the plaster has firmed enough to become solid, a long screwdriver is inserted into the tunnel and ditch holes. The caster carefully pries the bottom and top plaster shells apart.



58 The lower pan of plaster is removed.



59 The "blunt" butter knife is inserted into the back separation between the two upper plaster halves. A mallet is tapped lightly against the "blunt" butter knife until the two plaster halves come apart.



60 The left half is being removed from the foot.



61 The right half is removed from the foot.



62 The bottom and top plasters are being pried apart.



63 Ditto.



64 The customer is asked to lift the foot straight up and the bottom pan is removed.



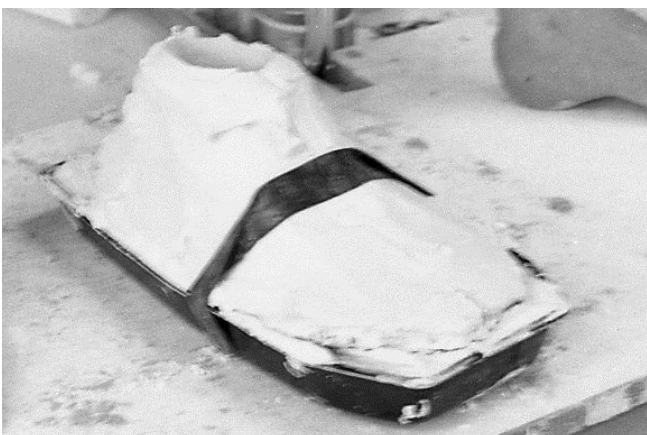
65 The customer is allowed to place the foot back onto the casting board.



66 The lateral half of the top plaster is removed.



67 The medial half of the top plaster is removed.



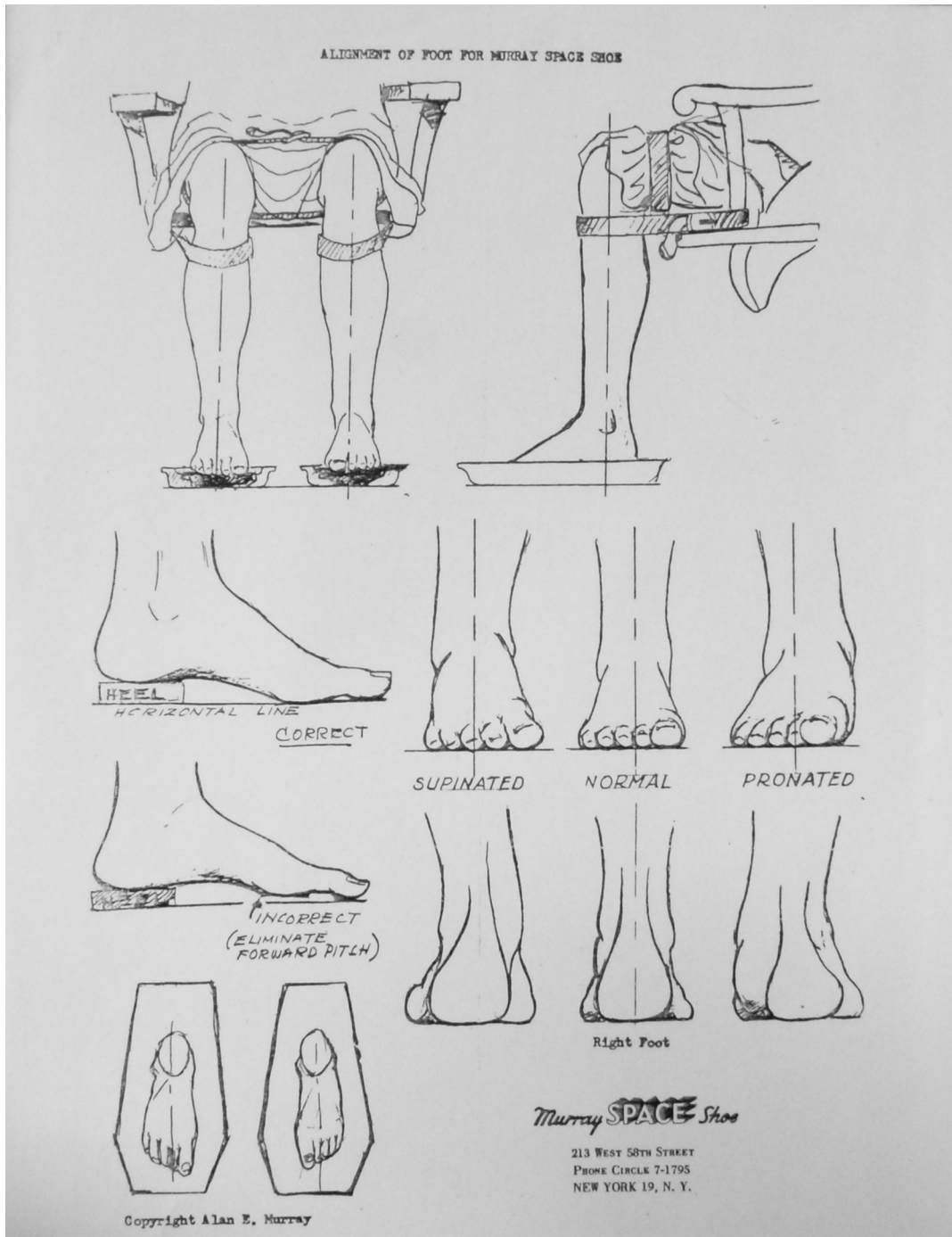
68 The three parts of the plaster shell are cleaned of sand and plaster fragments. The three plaster shell parts are put back together. A rubber band cut from an automobile inner tube is placed around everything to hold the multi part cast together.



69 The religious ceremony of foot washing, drying and foot powdering adds the finishing touch.

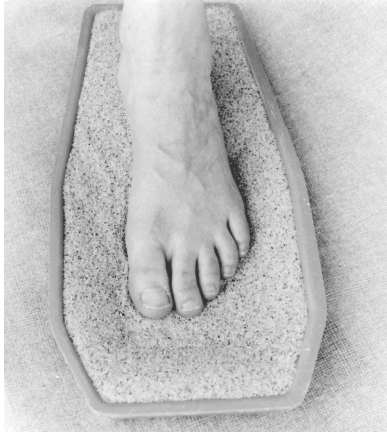


This is a copy of Mr. Alan E. Murray's directions for proper position and alignment of the person to be casted.

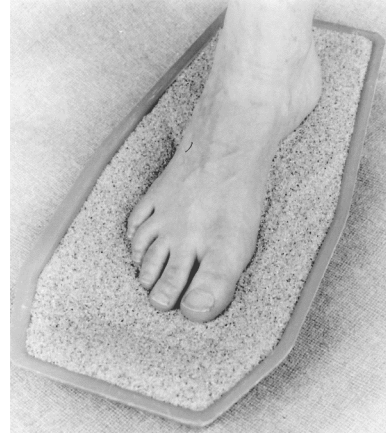


Mrs. Lucile Marsh Murray supervised many of the Murray Space Shoe businesses for many years. She supervised the training of many casters. She was adamant about the posture and alignment of the person being casted. She was also adamant about the caster being very observant and using good casting techniques.

Please observe the following pages of pictures of a foot in a pan of sand, in order to acquaint yourself with proper foot positioning, which should be in accordance with Mr. Alan E. Murray's principles as shown above.



1 Please note that in all these pictures (1-16) the knee joint is too far behind ankle. The lower leg is not in the proper position according to Mr. Murray's principals.



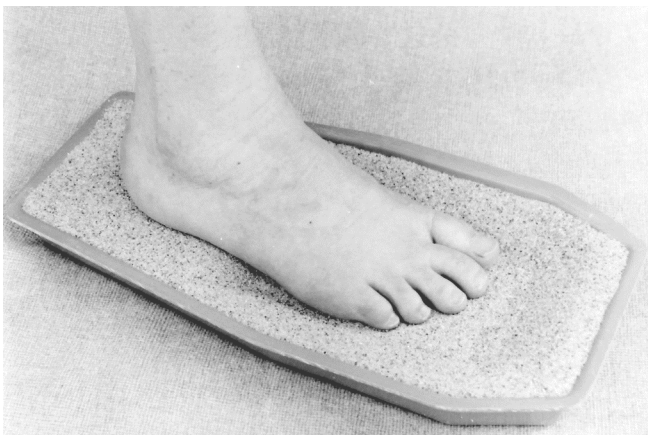
2 If the customer in these pictures had limited knee joint movement, limited ankle joint movement or required a heel lift, this lower leg angle might be correct for casting. The appropriate angle would have to be chosen by the caster.



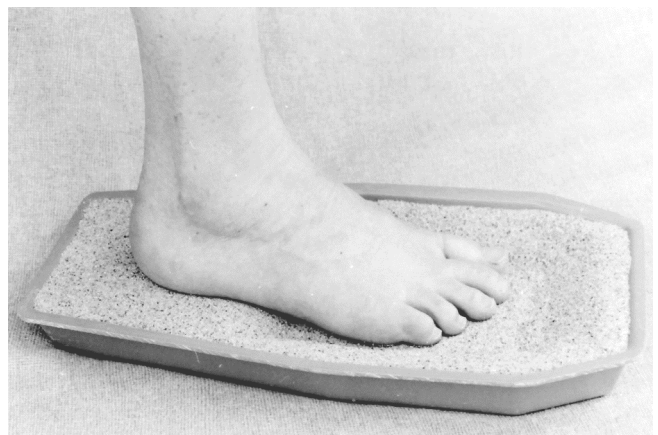
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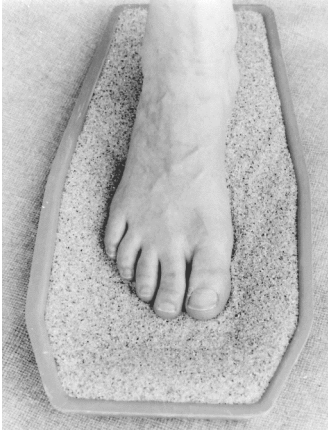
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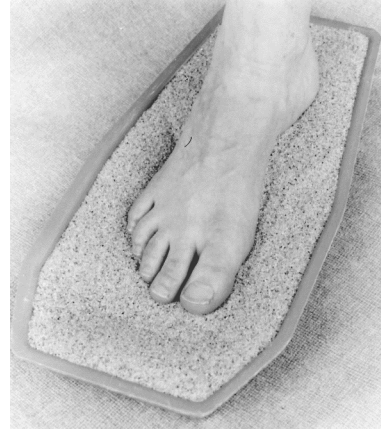
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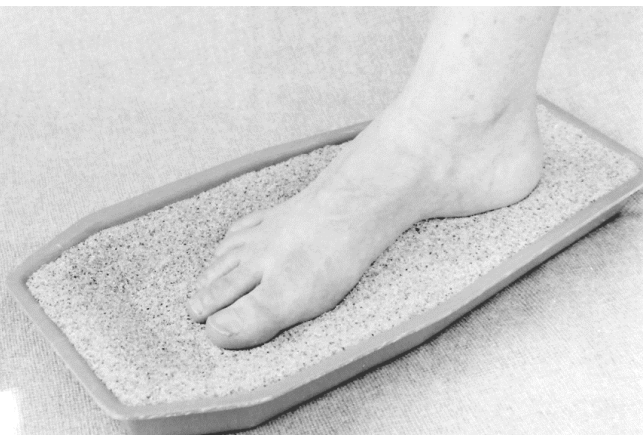
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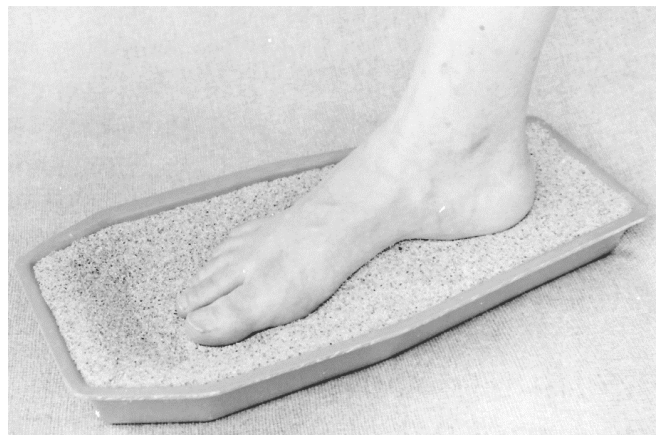
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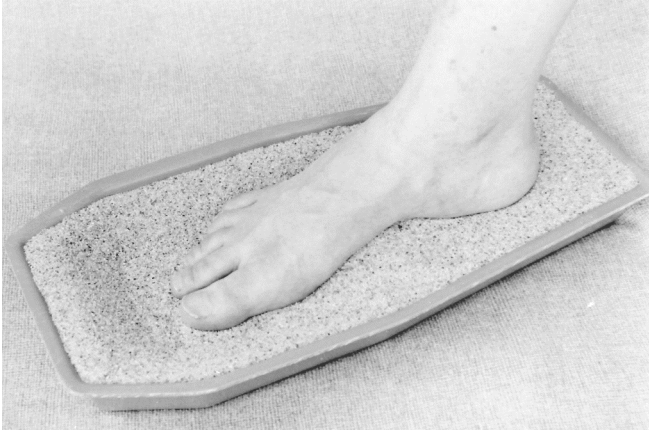
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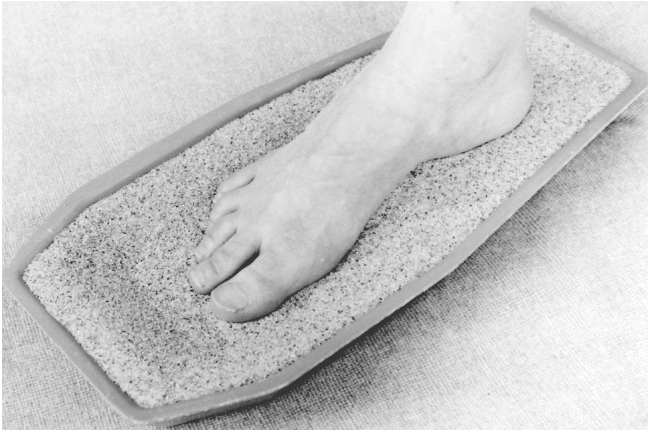
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12



13



14



15



16



Pictured is the concentrating craftsperson cleaning a cast.

I have made approximately 4 to 5 thousand pairs of MURRAY SPACE SHOE®S from plaster casts. Thirty five years is a long time to gain experience and practice a craft.

I have produced a lot of good work and made my share of mistakes. Making molded shoes is not a science. It is an art. I still don't know everything about the art and craft.

I am convinced that Mr. Murray had some really good ideas about making proper footwear. Therefore, I have endeavored to stay with his time proven basic principles.

I owe my successes to the knowledge that he left for us to learn.

Mr. Murray's original plaster casting method, as described and photographed in this chapter, is the standard for judging all other casting procedures. When done superbly, this casting method will produce very fine reproductions of the human foot.

If you want to use this method, I recommend reading several chapters of an old book "The Techniques of Casting for Sculpture" by John W. Mills 1967.

Mr. Murray's method takes time and patience. It can be very challenging with impaired subjects and/or a less than perfect performance by the caster. If you don't do this method correctly, you will not get quality results.

I have observed too many people who produced and accepted sloppy results from the casting. And, then expected quality footwear. It never worked! That is why I believe the caster and the footwear maker should be the same person. Or, as I am proposing in these four books "LEARN TO MAKE YOUR OWN MOLDED SHOES, BOOTS, & SANDALS".

Success with this plaster casting method only happens when the person being casted can cooperate with the caster. I do NOT recommend using this plaster casting method on the elderly, those with mental conditions, those with medical conditions, and those with physical conditions. Sometimes it will work beautifully, but many times it is a recipe for disaster.

The Murrays used primarily USG® #1 Molding Plaster for the plaster casting. It was, and still is, available on the east coast from USG® building trade suppliers. I have used USG® Dental, Dental Lab, and Casting Plaster (20 and 30 minute). But, I like to use HardieCast® which is now Certainteed® 30 minute casting plaster (800-782-8777).