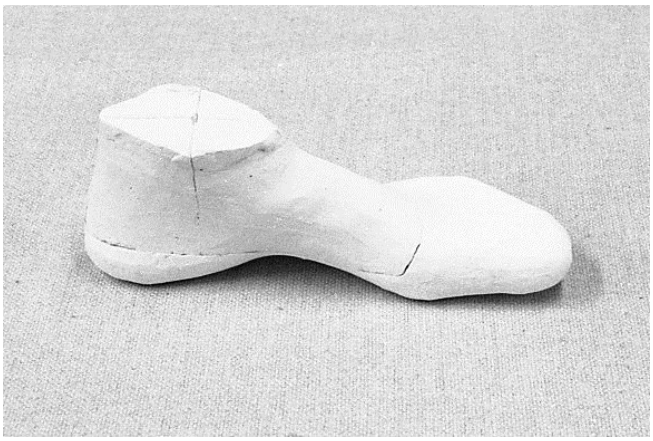
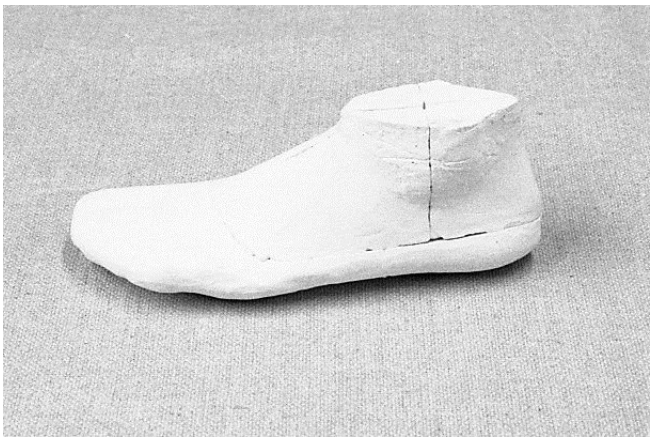
SHOE FABRICATION TECHNIQUES

CHAPTER 1

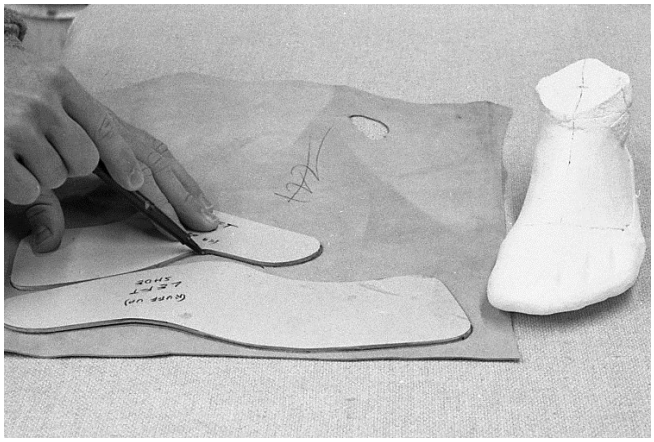
TRADITIONAL REGULAR WEIGHT



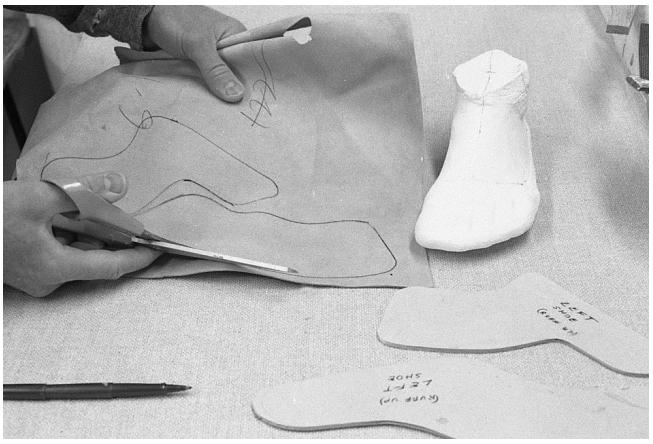
1 Medial (inside) view of last (modified cast) which provides the form for fabrication of the traditional regular weight molded shoe.



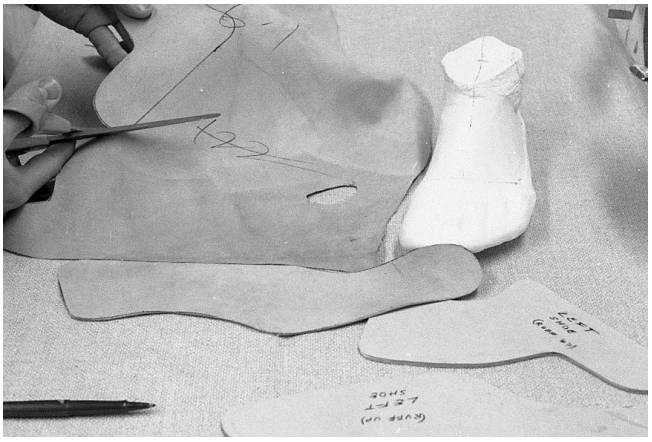
2 Lateral (outside) view of last (modified cast) which provides the form for fabrication of the traditional regular weight molded shoe.



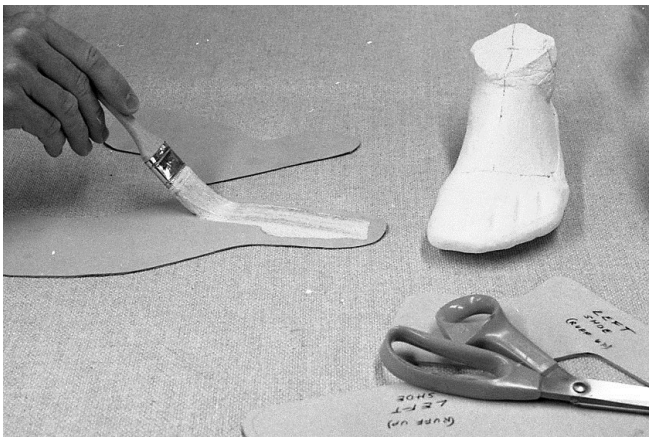
3 Lining patterns are traced onto lining leather.



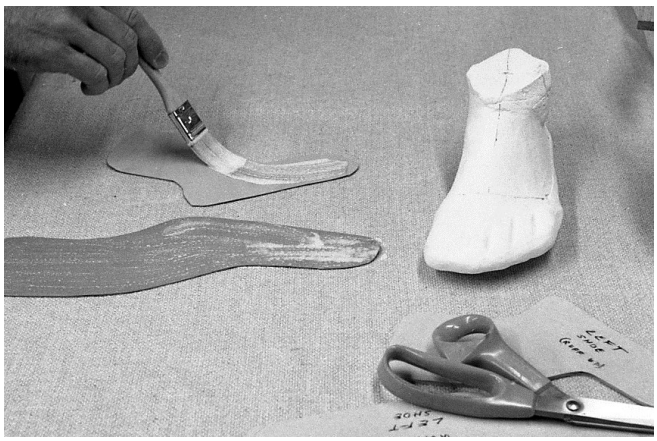
4 Lining leathers are cut according to patterns.



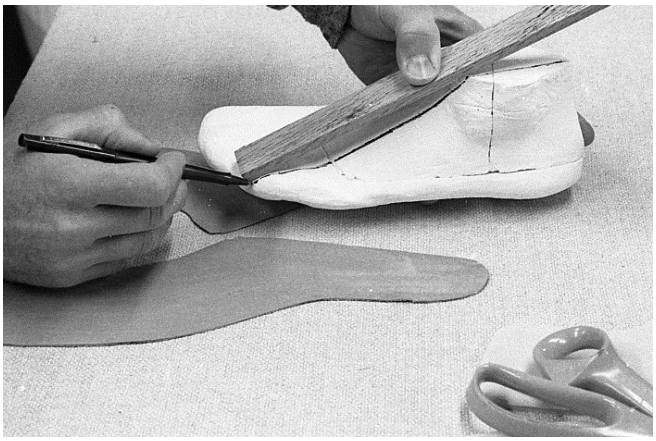
5 Ditto.



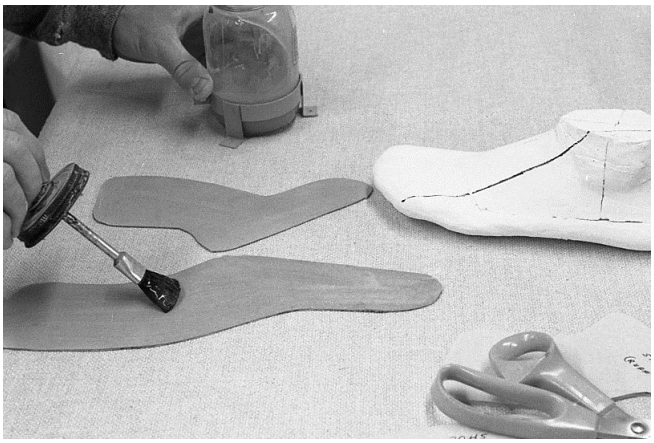
6 Leather linings are placed smooth side up. They are then brushed with a coat of thin latex and allowed to dry.



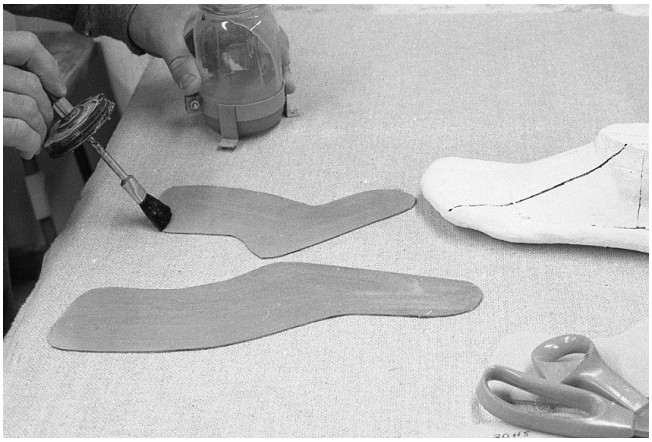
7 Ditto.



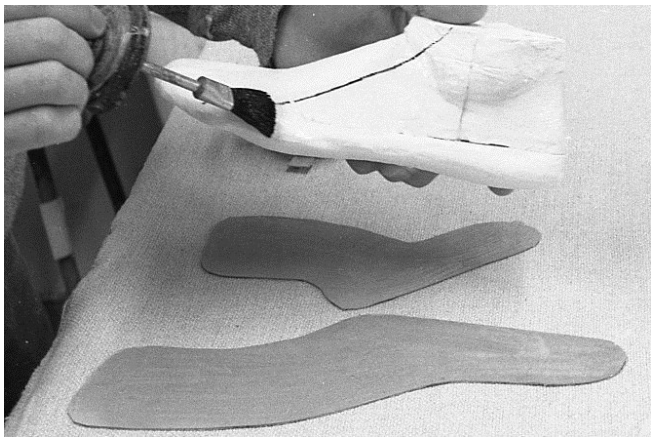
8 The position of the lace opening is marked on the last (cast).



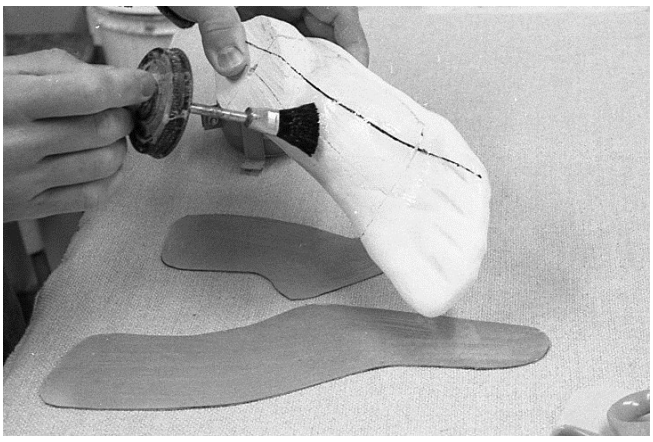
9 Rubber cement is applied over the dried latex and is allowed to dry tack free.



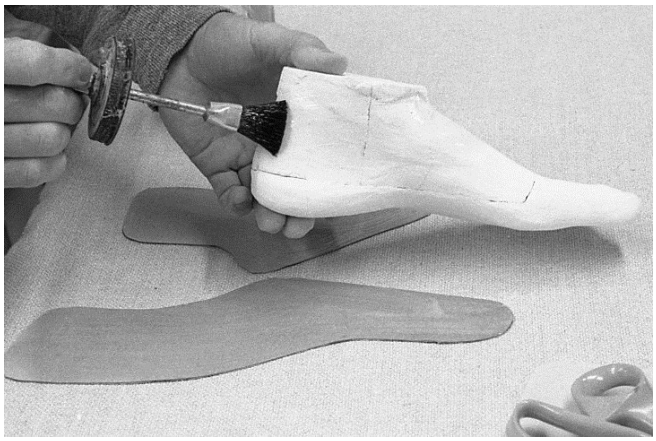
10 Ditto.



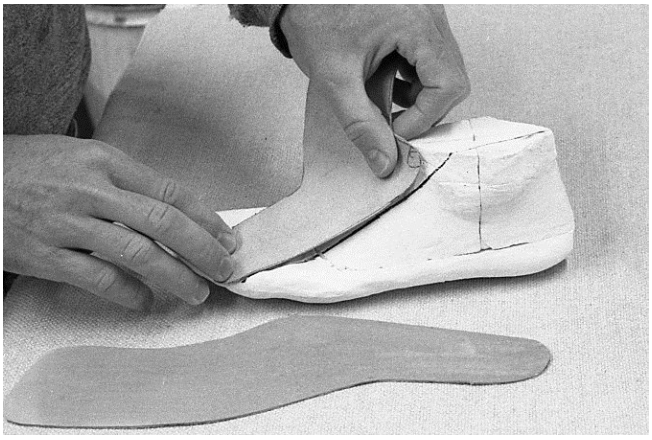
11 Rubber cement is applied to areas of last where lining leather will be placed, and is allowed to dry tack free.



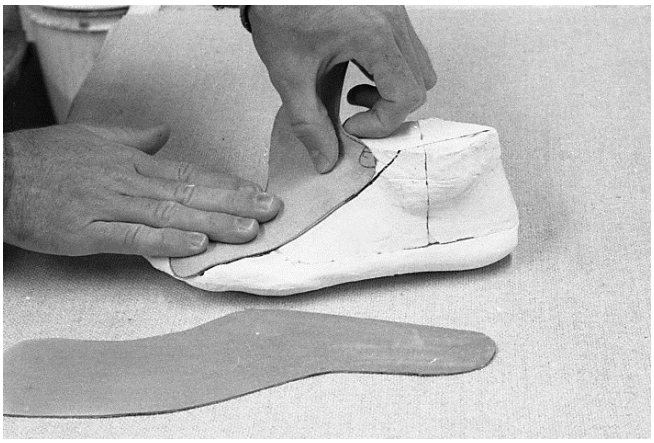
12 Ditto.



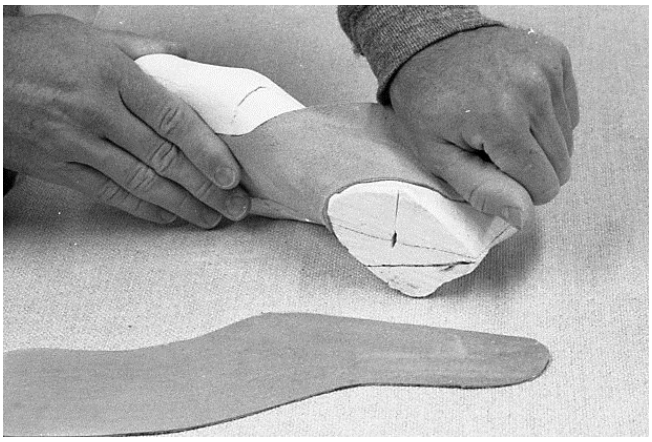
13 Ditto.



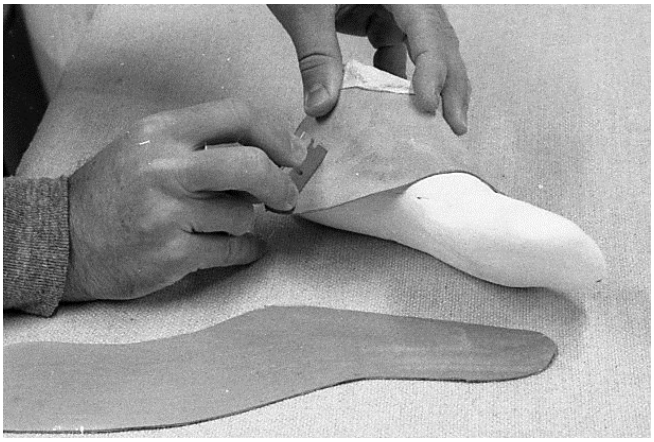
14 The leather front lining is stretched, placed around last and pressed into place and smoothed.



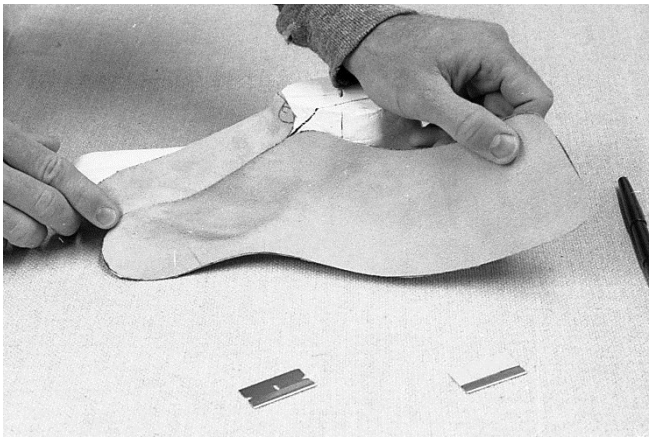
15 Ditto.



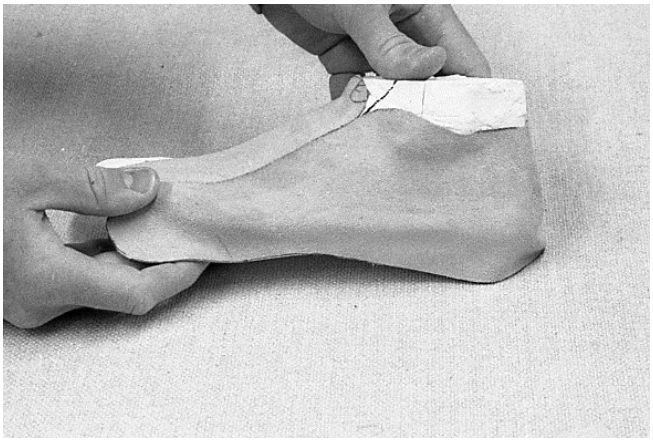
16 Ditto.



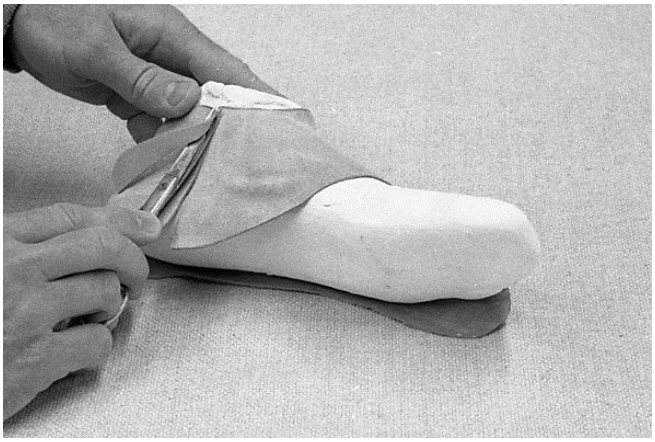
17 The front lining is cut at a desired seam location with a single edge razor blade.



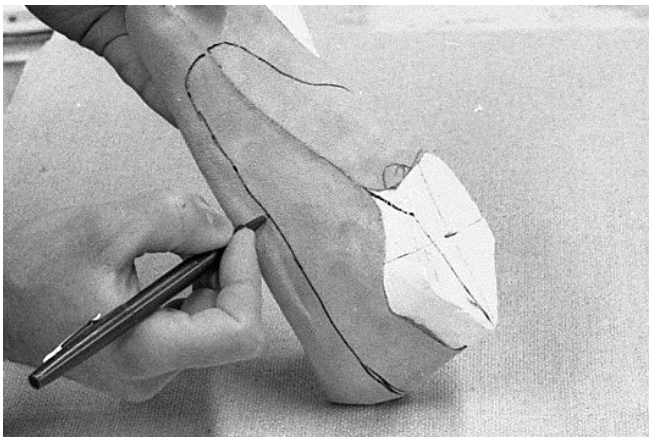
18 The back lining leather is joined at the lace opening.



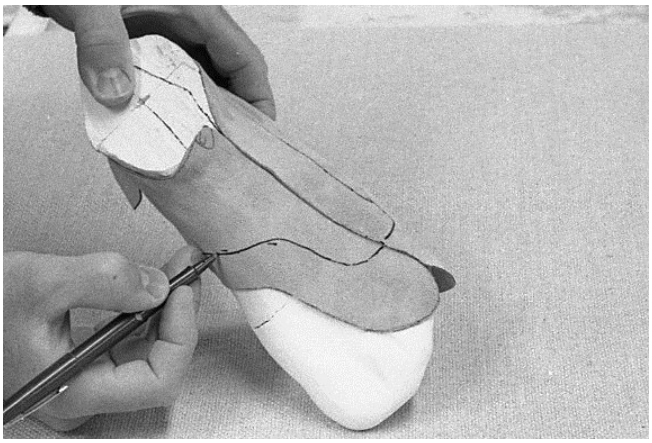
19 The back lining leather is pulled around the back.



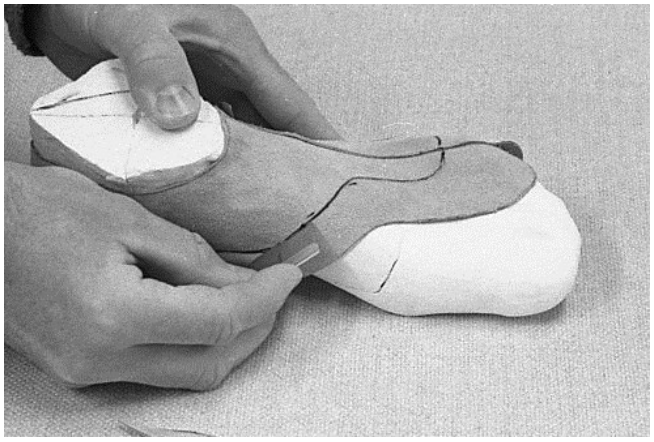
20 The back lining leather is trimmed to meet front lining leather at medial (inside) seam.



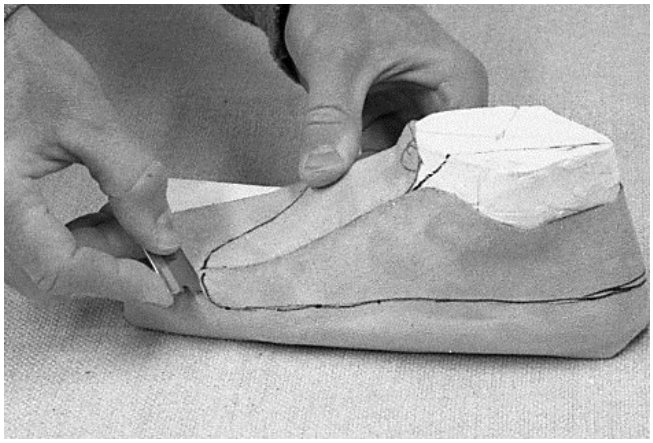
21 A pattern line is drawn for trimming bottom of lining leather.



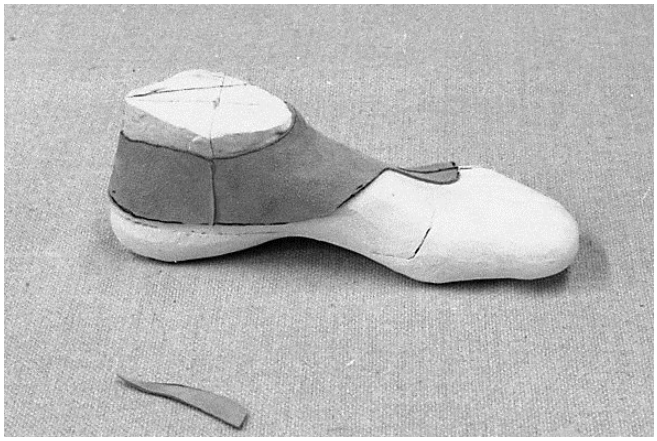
22 Ditto.



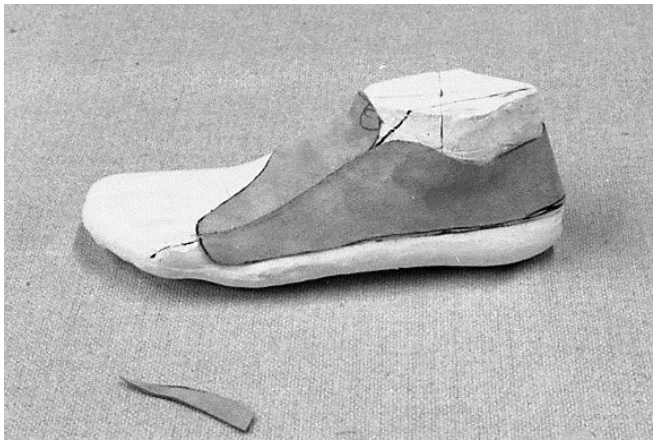
23 A single edge razor blade is used to cut off excess material.



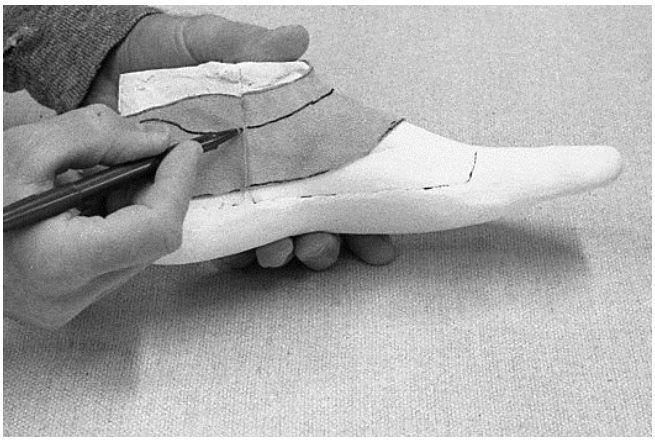
24 Ditto.



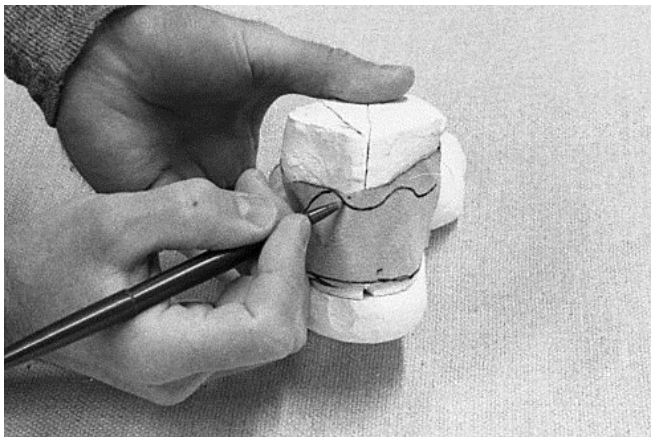
25 The medial (inside) lining leather (smooth to inside/ ruff out) takes its desired shape.



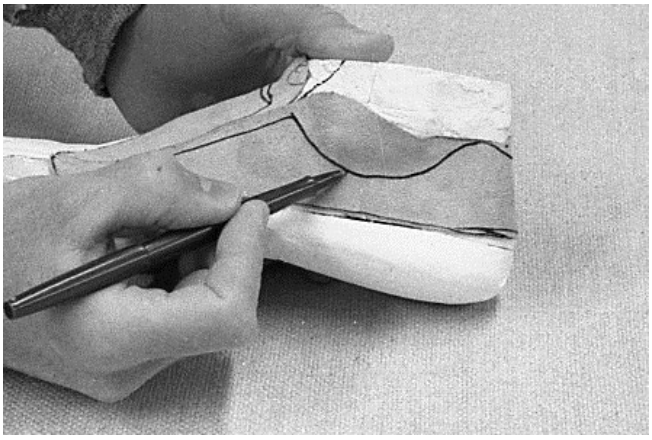
26 The lateral (outside) lining leather (smooth to inside/ ruff out) takes its desired shape.



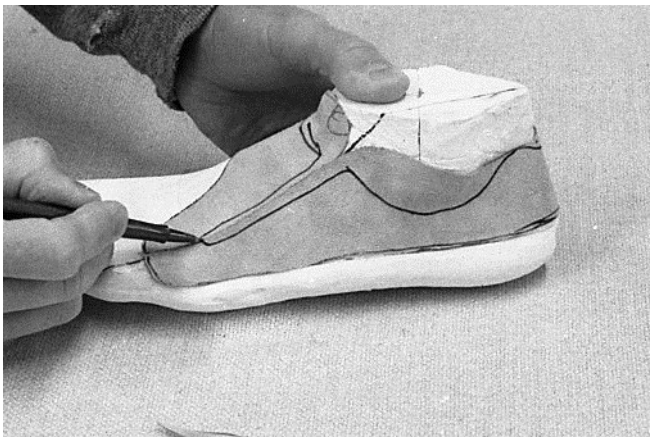
27 The top edge of shoe is designed with a marking pen.



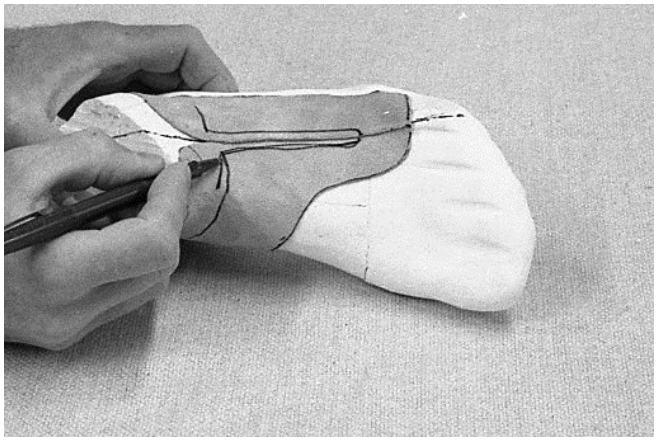
28 A scallop is made for the Achilles tendon.



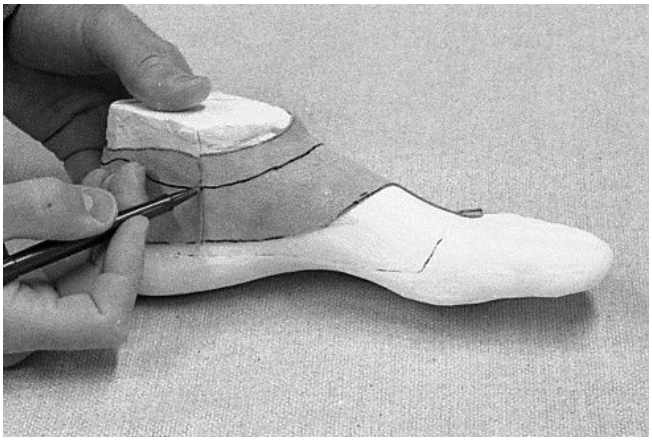
29 A scallop is made for lateral ankle bone.



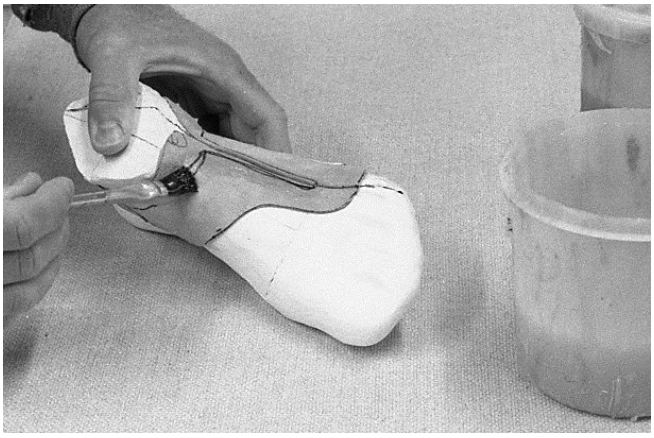
30 The lace opening is designed.



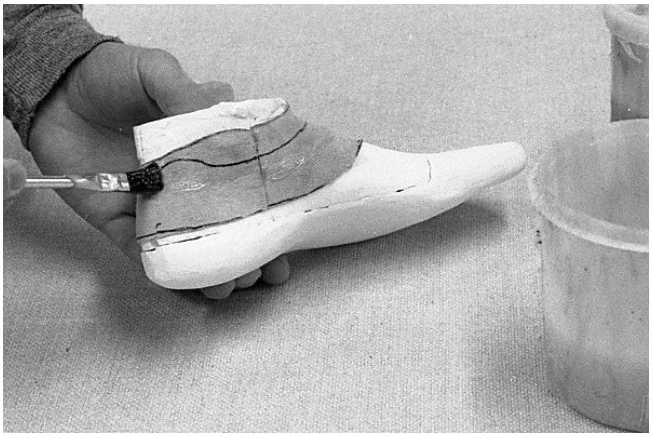
31 The front top is designed under/ forward of the front of ankle joint.



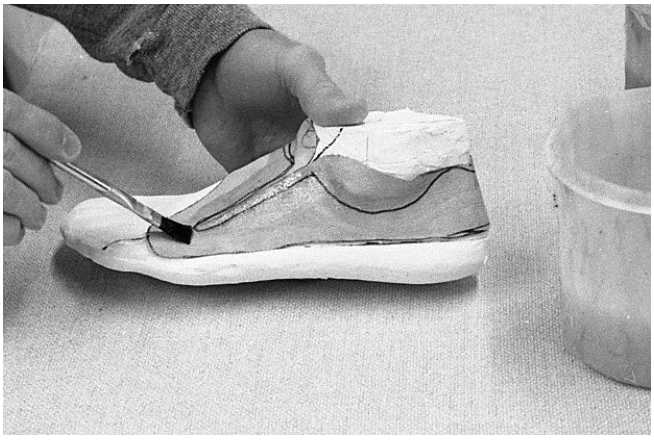
32 A scallop is made for the medial ankle bone.



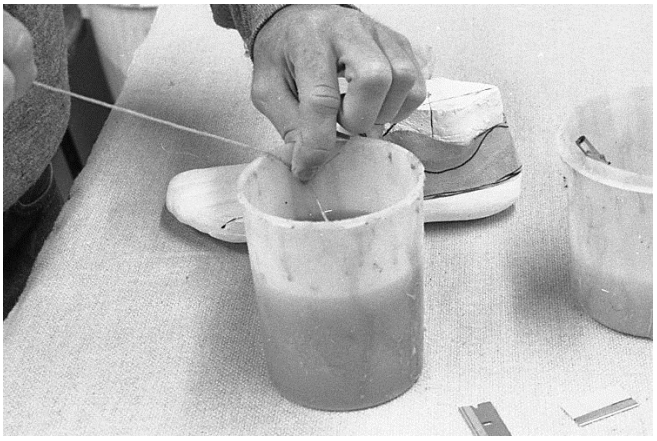
33 Glue (or latex) is applied over upper shoe design markings.



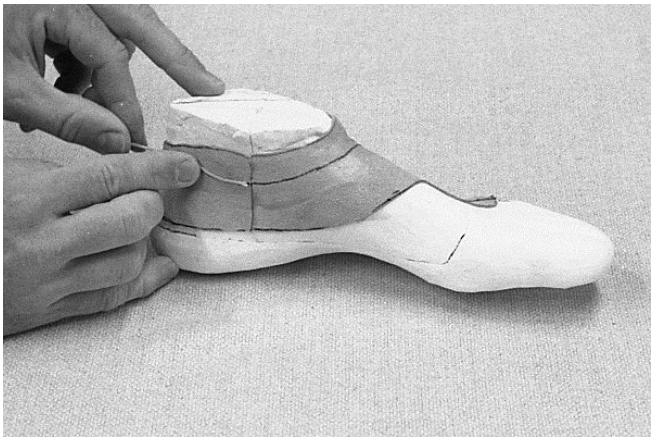
34 Ditto.



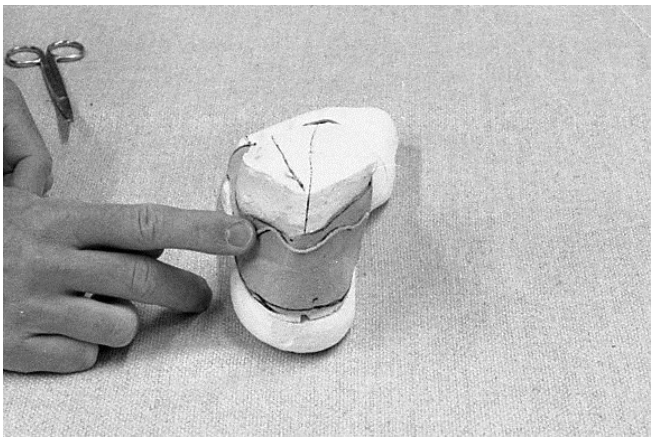
35 Ditto.



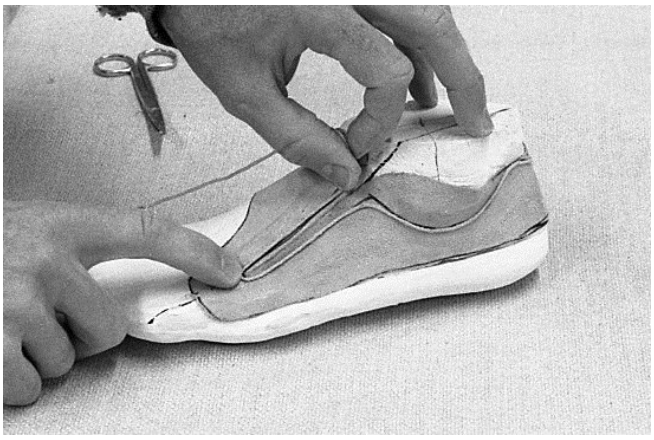
36 Excess glue is removed from string soaked or run thru glue (or latex). Multi-purpose twine #18 twisted cotton or similar works very well.



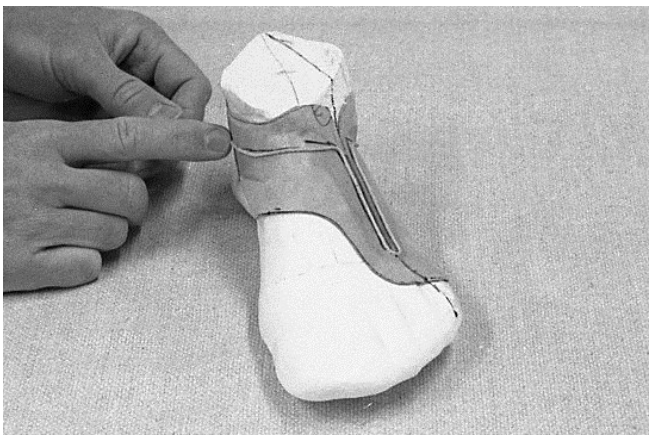
37 Semi dry (almost tack free) string is applied to upper shoe design marking.



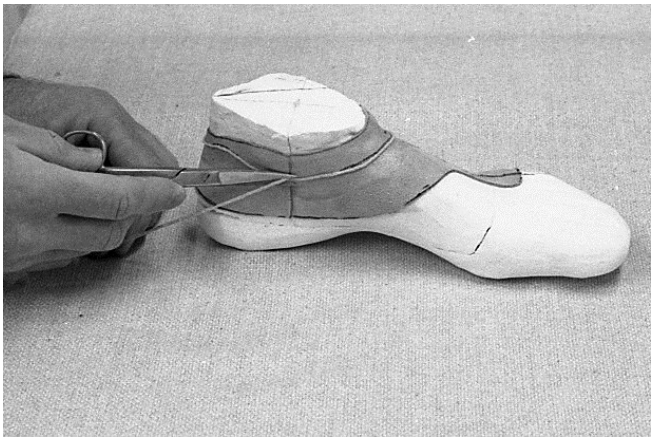
38 Ditto.



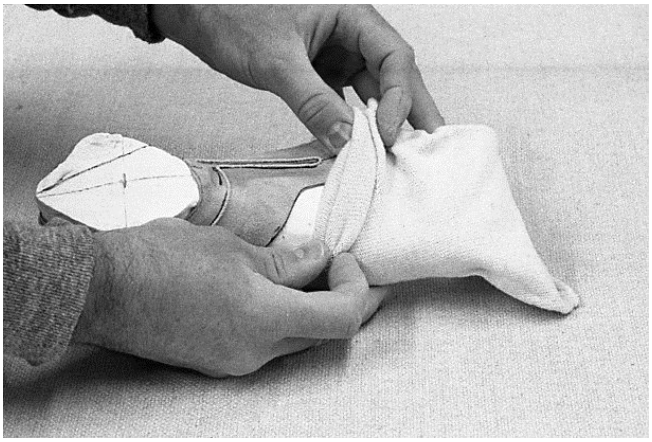
39 Ditto.



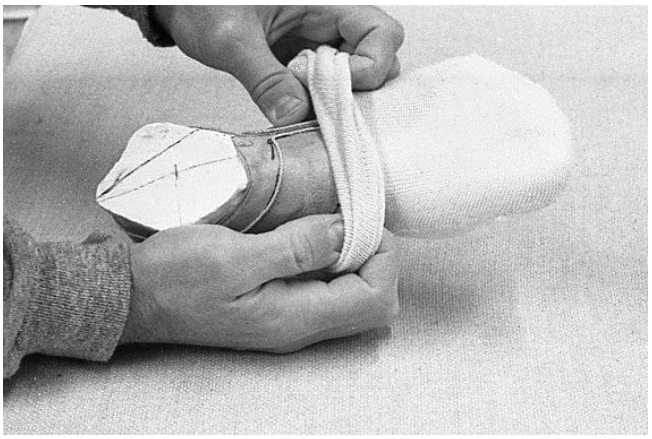
40 Ditto.



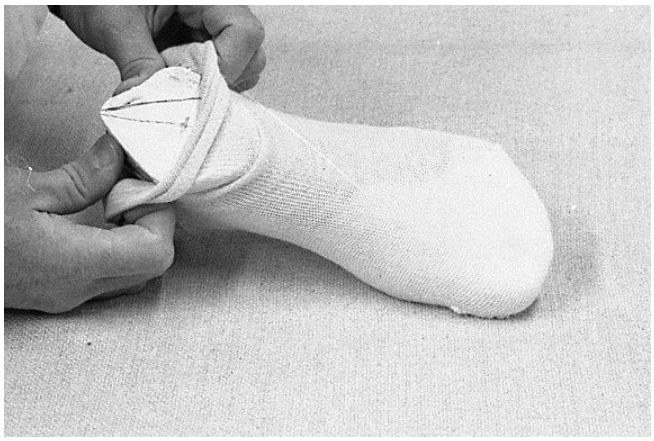
41 Ditto.



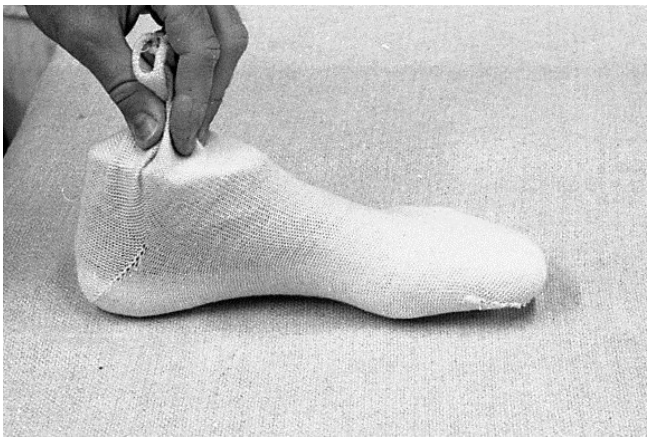
42 A double knit (2 strains of yarn) cotton sock is pulled over the shoe last.



43 Ditto. The socks are knitted on a Banner Knitting Machine by Hemphill Company made about 1924 or 1925. The socks are seamed on a Merrow sock seaming machine. A straight stitch on a standard sewing machine will do.



44 Ditto. The yarn used for knitting is 12/1 knitting twist 100% carded cotton yarn from Harriet and Henderson Yarns (now) Frontier Spinning Mills.



45 The sock is snugged up (not too tight—not too loose).

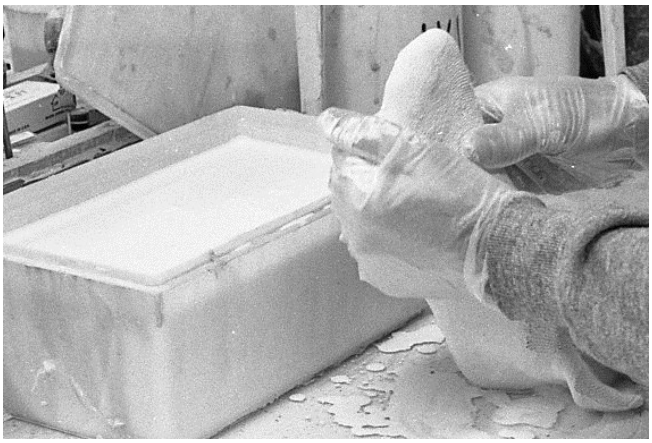
46 Ditto.

47 The whole last with sock is immersed in latex.

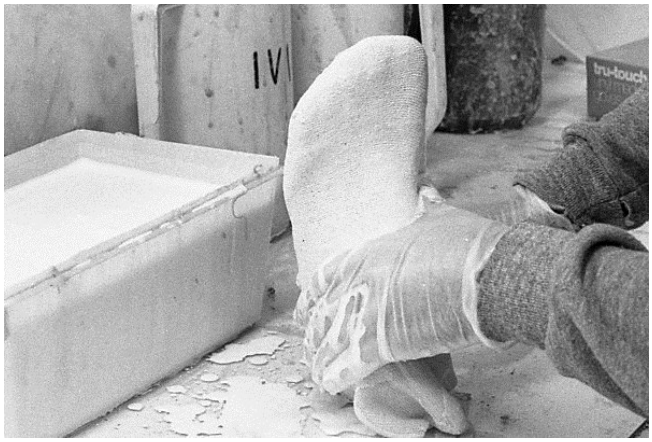
48 The latex used is 3E6S by General Latex and Chemical (now) Poly One. The latex has been thinned to desired working consistency with distilled water.

49 Excess latex is removed.

50 Ditto Body acids will deteriorate natural latex sooner than synthetics. But, natural latex is also acceptable.



51 More excess latex is squeezed from cotton sock.



52 After squeezing, the sock should not drip.

53 Hand mold sock to form to last by pressure and heat from hands. The objective is to have no voids or air bubbles between sock and last.

54 Mold in the toe crest/pyramid to fit sock to last.

55 Mold in arch to fit sock to last.

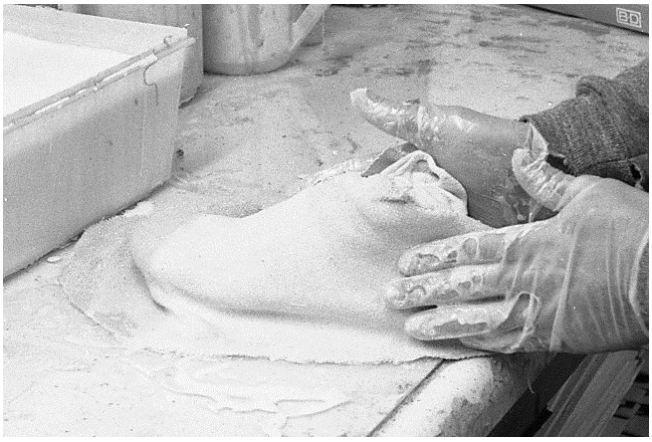
56 A piece of Monks Cloth is dipped into latex.

57 Latex is evenly distributed onto Monks Cloth. The nicest scissors for this kind of work are Miltex mayo operating 5.5" sharp CVD 5-116.

58 Ditto.

59 Latexed Monks Cloth is laid over socked last.

60 Cut Monks Cloth down to top of shoe design.



61 Mold Monks Cloth around last.

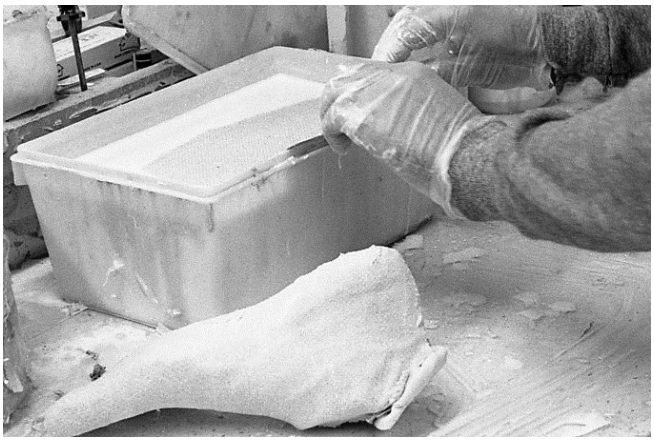
62 Seam Monks Cloth at back of last.

63 Fold and trim latexed Monks Cloth to fit bottom of last.

64 Ditto.

65 The objective is a smooth and contoured layer of Monks Cloth over socked last without voids or air bubbles.

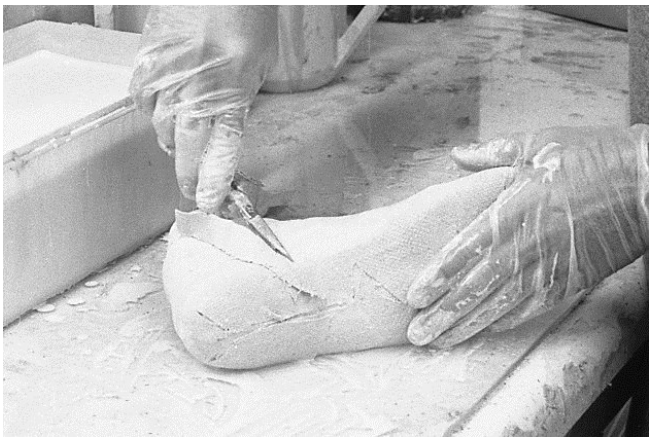
66 Everything should look smooth and well molded to fit last nice and snug.



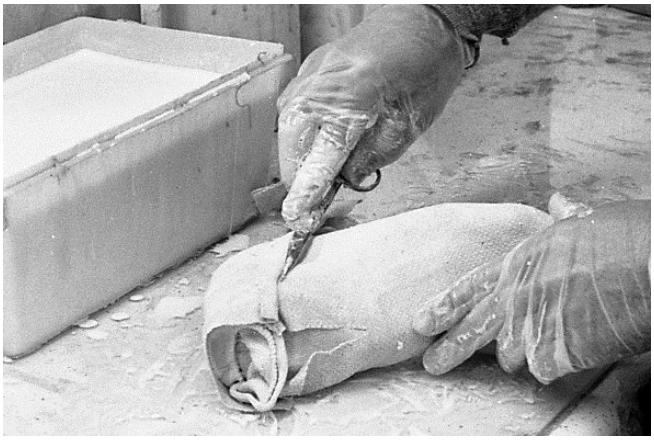
67 Dip back piece of Monks Cloth into latex.

68 Apply Monks Cloth to back of last covering seam and bring forward.

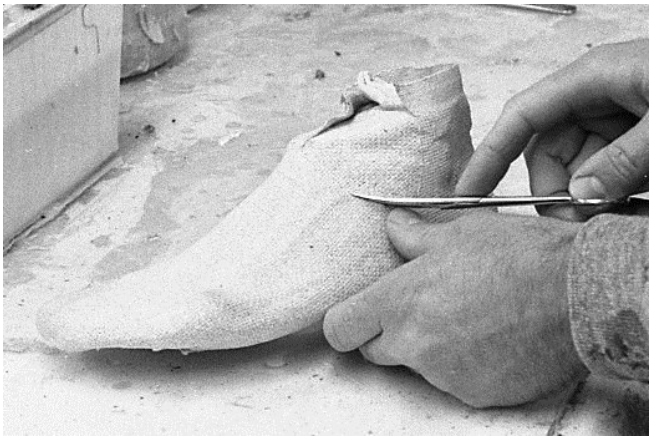
69 Fold and trim Monks Cloth to form a nice smooth heel counter (stiffener).



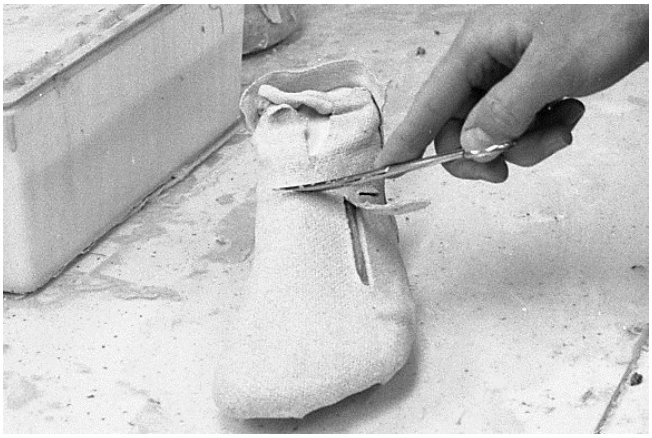
70 Ditto.



71 Notice shoe top design string.

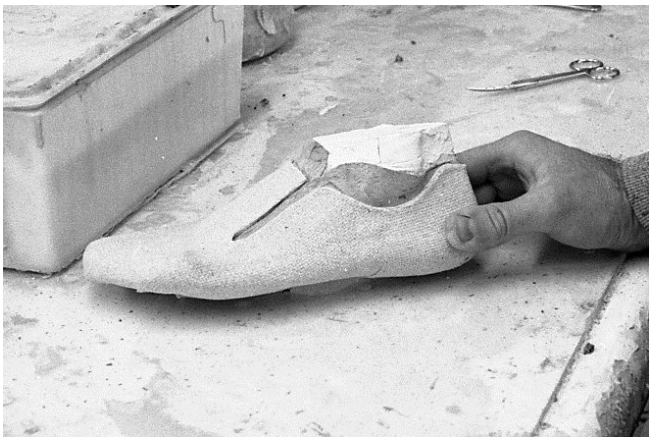


72 Ditto.



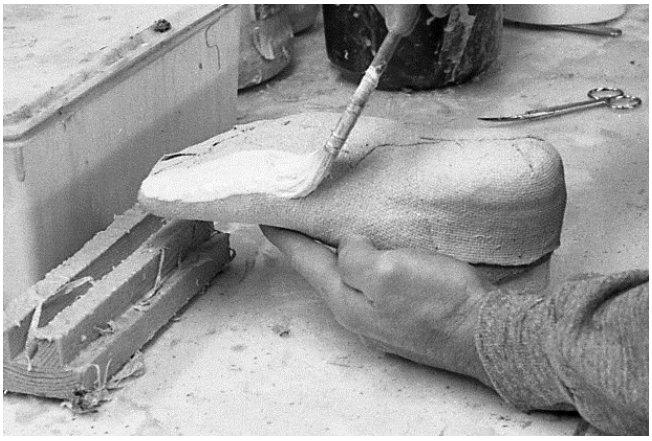
73 Cut above shoe top design string.

74 Remove unneeded materials.



75 View the top of shoe design.

76 Ditto. Then let latexed materials dry.

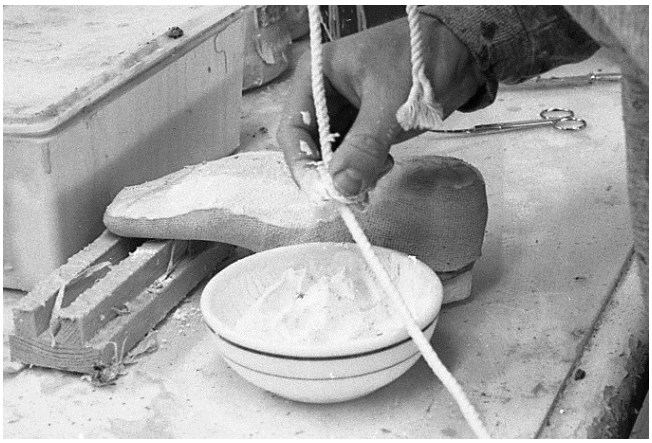


77 Paint latex around bottom of last.

78 Ditto.

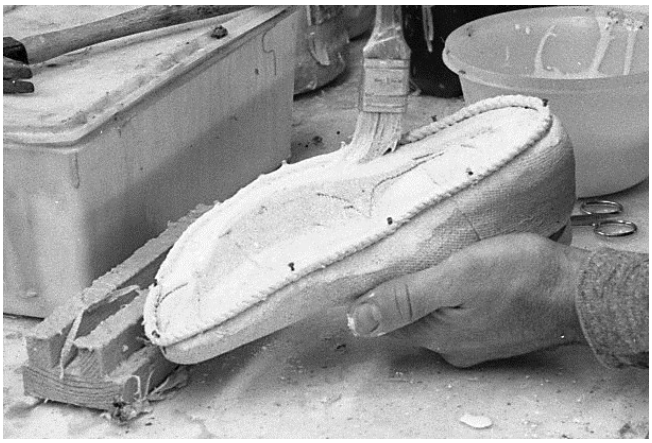
79 Soak or dip 1/4" or 3/16" cotton cord (rope) in latex.

80 Strip excess latex from cord.

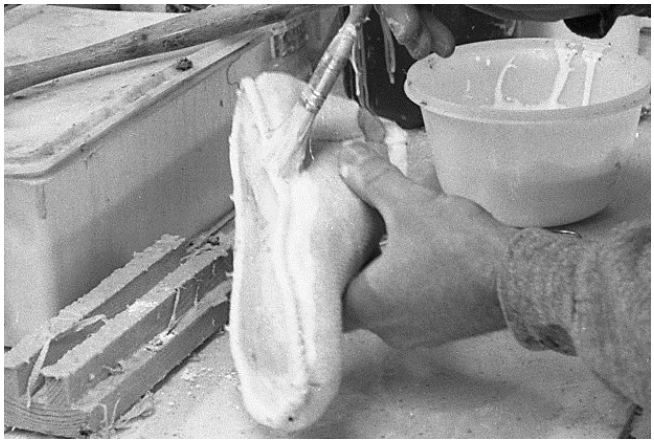


81 Add a light coating of Hydrocal® or standard plaster to cord to make it stick and set up.

82 Apply latexed and plastered cord to bottom of last.

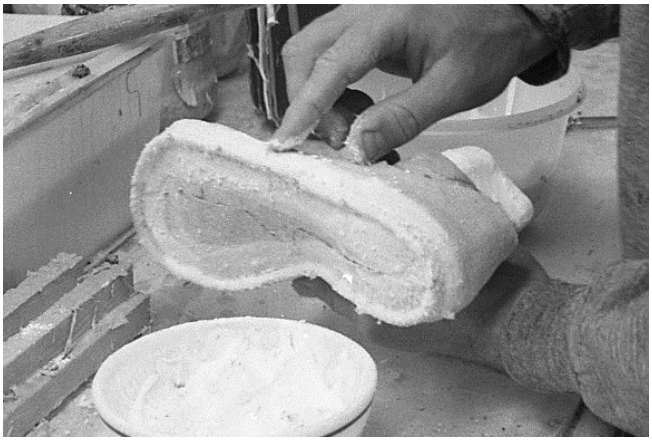


83 Make a fence to hold in the liquid base. Use hand shoe tacks #2—1/2 oz. to hold fence in place if necessary.



84 Add latex to glue and seal cord to Monks Cloth.

85 Apply Hydrocal® or standard plaster to speed set up of latex.



86 Fill any voids between cord and Monks Cloth.

87 Extra latex is applied to make sure the bond is firm.

88 The cords should be flush with the outside edge of last to give a normal and functional base.

89 Three heel cords are applied, latexed and plastered.

90 Ditto.

91 Ditto.

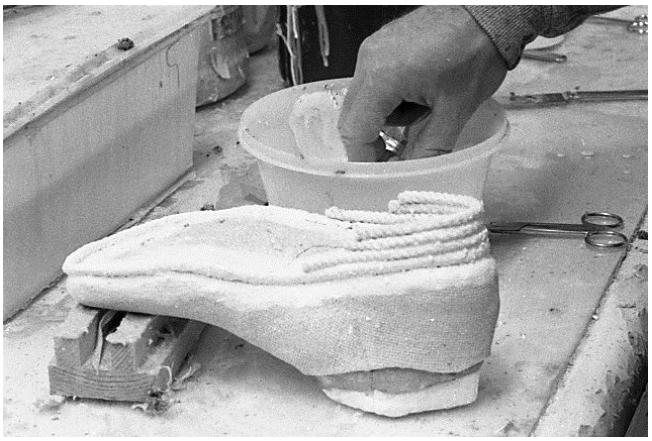
92 Ditto.

93 Ditto.

94 Re-latex cords inside.

95 Re-latex cords outside.

96 Once all layers of cords have dried, a piece of oversize terry cloth is cut.

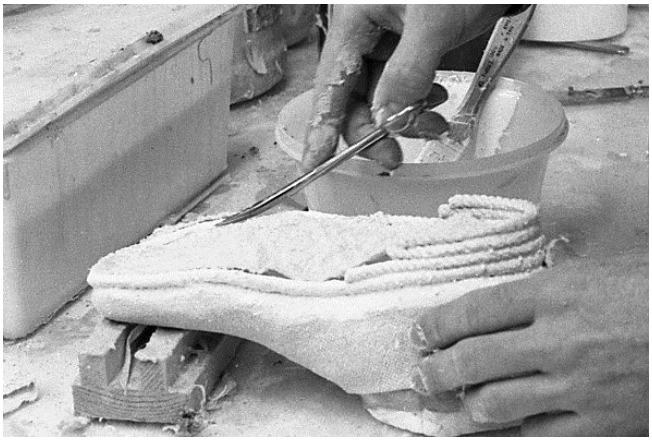


97 The terry cloth is soaked in latex.

98 Excess latex is pressed out of terry cloth.

99 Monks Cloth inside cords is latexed.

100 Latexed terry cloth is cut to fit inside cords.



101 Edges of terry cloth are pressed to cords.

102 Ditto.

103 Terry cloth is re-latexed.

104 A mixture of mud is made and applied to build a semi-flexible base between the contours of the foot shape and the walking surface.

This semi-flexible base is the key to successful MURRAY SPACE SHOE®S and all molded footwear. This mud base is a mixture of natural latex 1V10, 1-N-49 by General Latex and Chemical, now by Poly One®. Latex 74 from Douglas and Sturgess by Poly One® is also a natural latex with very similar properties. Bluetex molding compound from Douglas and Sturgess by CMC Products is another good natural latex with very similar properties (LN-400 is blue, LN-401 is white). Five gallons of Latex 74 is thinned with two gallons of distilled water and two quarts of household ammonia. It is then mixed with an electric drill paddle to approximate a consistency of about 60% solids more or less.

Dry mud mix is approximately 30% 20/40 granulated cork (Maryland Cork Company), 60% hardwood 20/60 flour D grade (M10) (Composition Materials) and 10% softwood 100 mesh or –60 flour (600) (Composition Materials). All three ingredients are mixed and sifted to make a uniform mixture.

Latex is poured into a bowl and the dry mud flour mix is added, stirred with a butter knife or small paddle. The mixture will slightly slump or stand up when it is about the correct consistency. Trial, error and experience will produce a consistent product.

Poly One®: www.ployone.com 1-866-POLYONE

Douglas and Sturgess: www.artstuf.com 510-235-8411

CMC Products: www.cmcproducts.com 909-621-5871

Maryland Cork Co.: www.marylandcork.com 410-398-2955

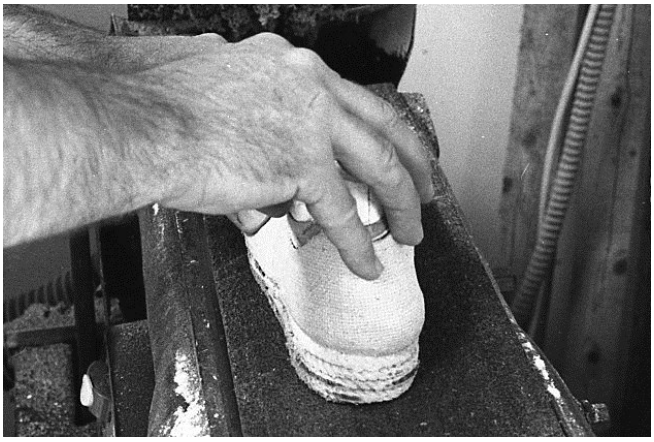
Composition Materials: www. Compomat.com 800-262-7763

105 Apply liquid mud (soft rubber butter).

106 Rough finish base using water and/or latex on butter knife to produce a smooth desired shape.

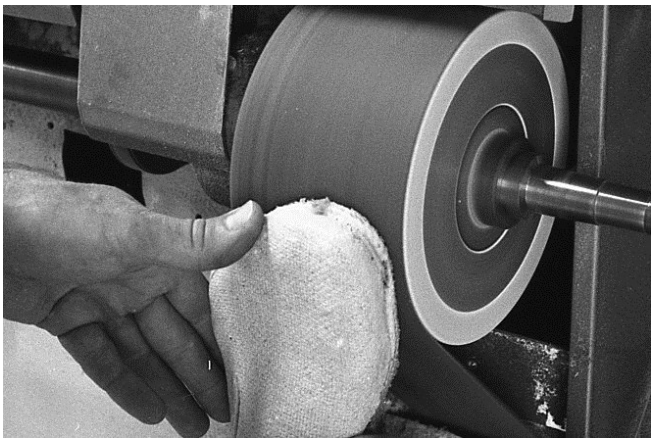
107 After one to three days of drying sand the excess of hardened mud mix on a belt sander to shape as desired.

108 Ditto.

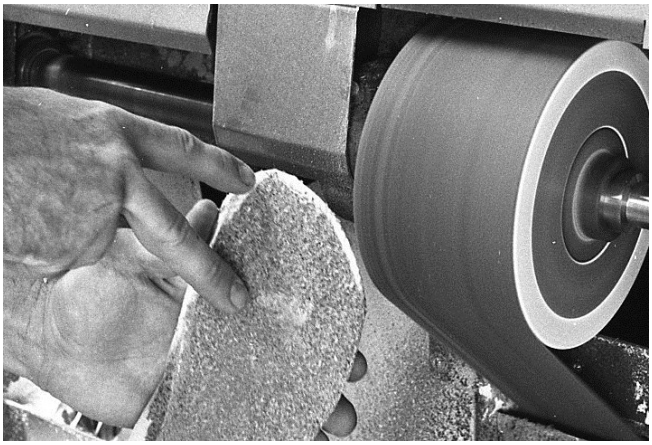


109 Grind flat walking base on flat belt sander.

110 Proper grinding is flatness from back of heel to ball of last (foot). Stop when you see terry cloth at ball of foot. If you are uncertain of exact measurements of thickness of base, poke a needle into base until you feet hard plaster of last (cast).

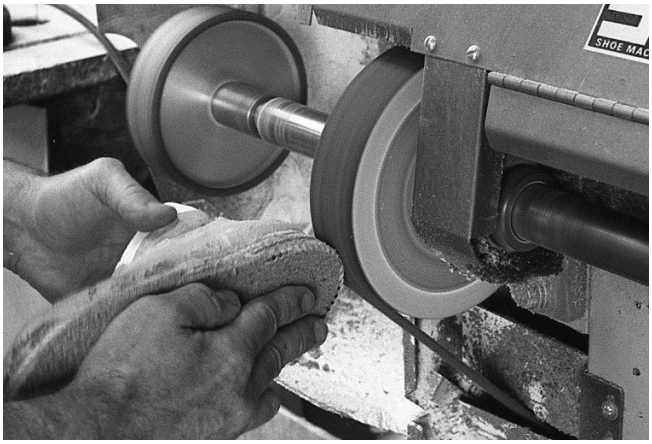


111 Taper ball to front of toe box.



112 Check to make sure transition of angle at ball is nice and comfortable for walking at area of ball of foot.

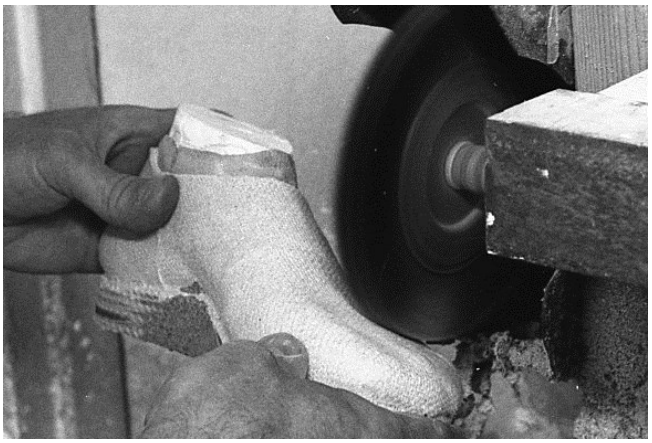
113 The mud is allowed to dry 3 to 5 more days and a final sanding is done along outer edges.



114 Ditto.

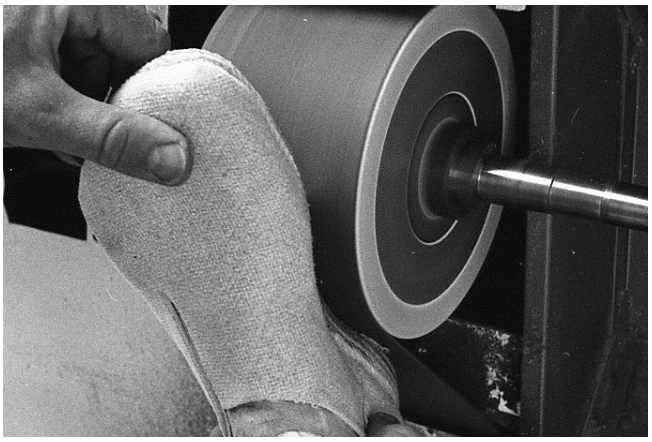
115 The top of shoe is cleaned above cord base.

116 Monks Cloth and/or sock is best cleaned with a fine wire brush.

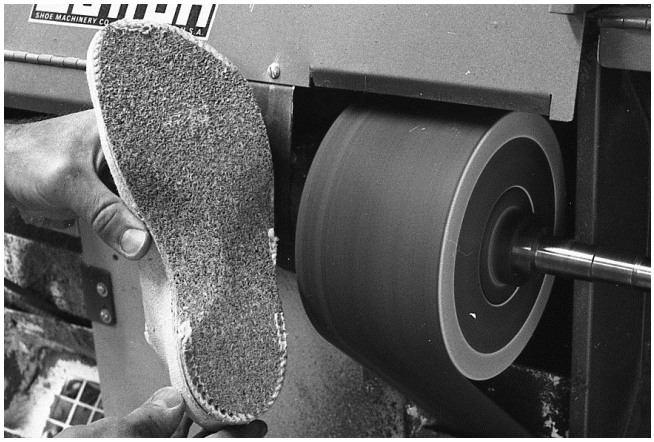


117 Ditto.

118 The lateral area under arch is usually beveled or scalloped to achieve a graceful looking shoe with some flexibility of arch.

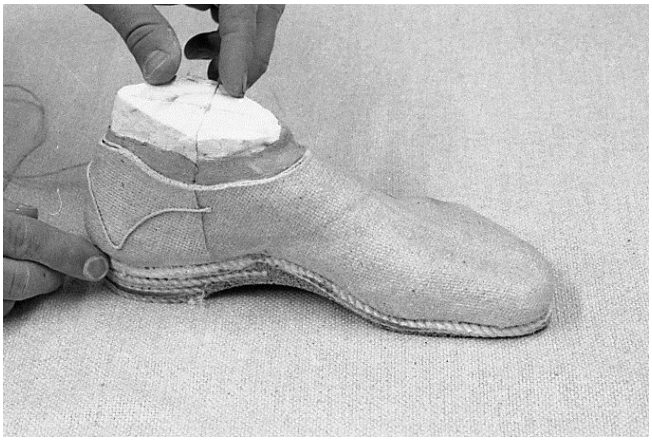


119 The medial area under arch is usually beveled or scalloped to achieve a graceful looking shoe with some flexibility of the arch.

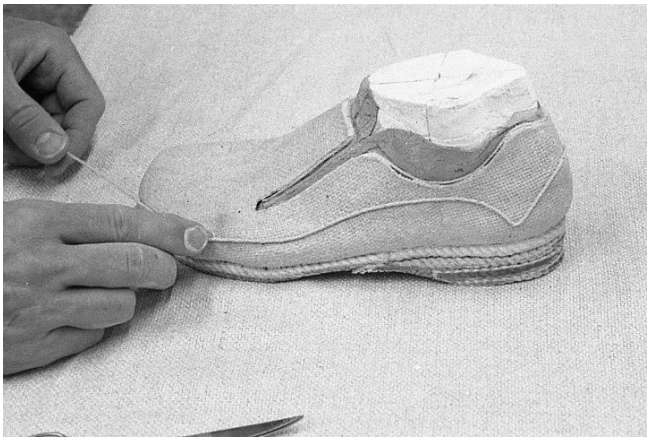


120 View of completed medial and lateral arch scallops. Sometimes, no arch scalloping is done because wearer may need maximum support and stability.

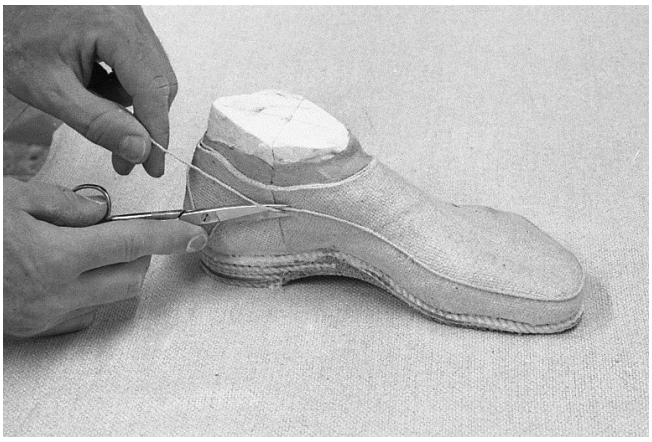
121 Shoe top Monks Cloth and sock is trimmed to cord which was used to design top of shoe.



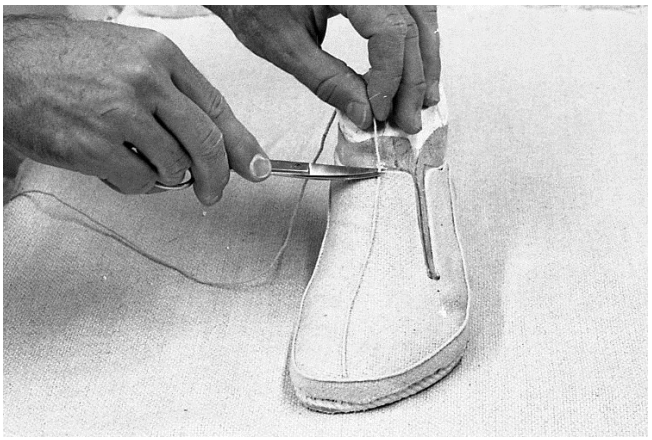
122 Design cording #18 cotton twist is applied with latex and plaster or glue. You can use any design pattern that you want. The cords will be embossed so they show through the outer leather as a raised design.



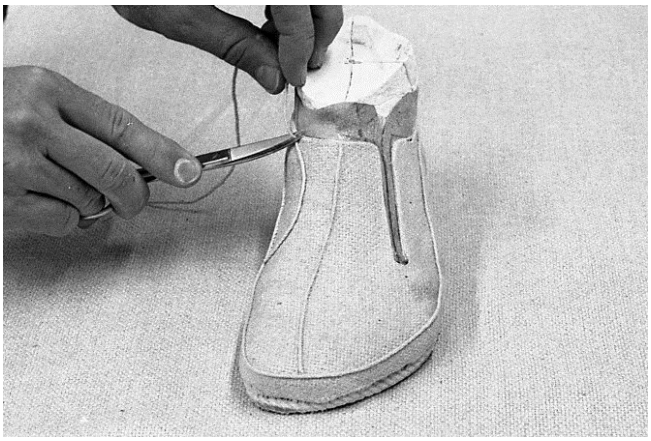
123 Ditto.



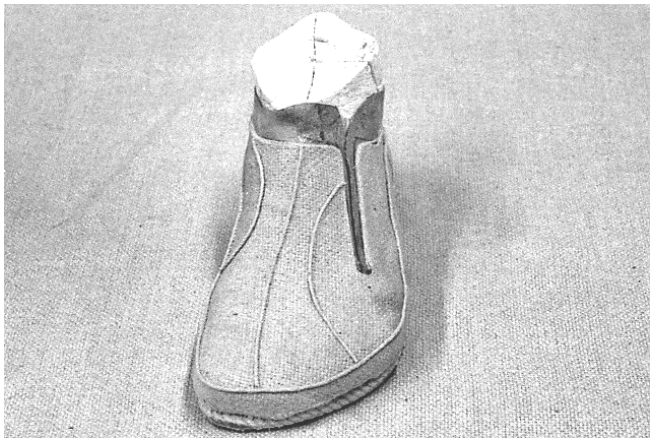
124 Ditto.



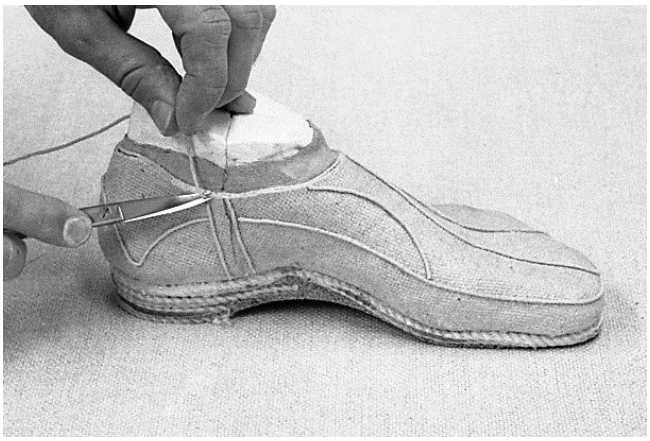
125 Ditto.



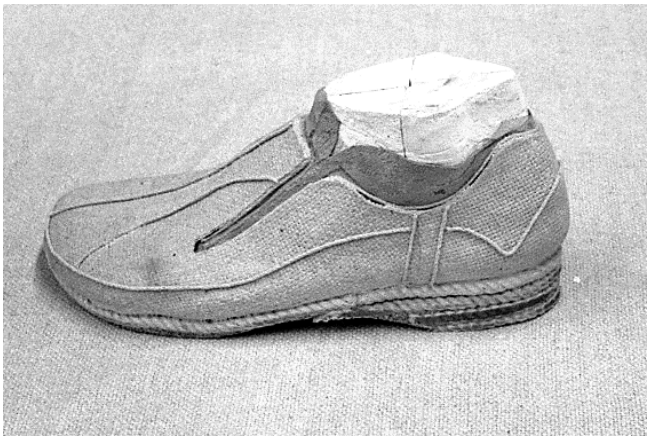
126 Ditto.



127 Finished front view.



128 Finishing medial side by putting on side seam cords.



129 Finished lateral view.

130 The outer leather can be soaked in water or latex. It can be soaked as required to get it soft and stretchy (usually 10 to 20 minutes).

131 Excess water or latex is removed. Then, leather is placed on a glass surface and a coat of latex is applied with paint brush to underside of leather, which will become molded and bonded to shoe.

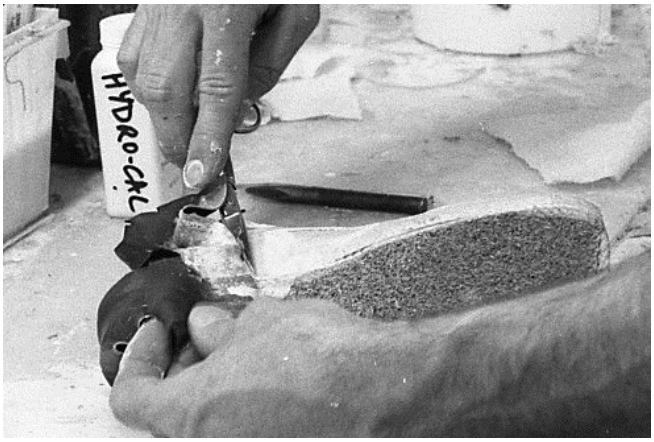
132 Latex is brushed onto inner fabric of shoe.

133 The leather is latexed again.

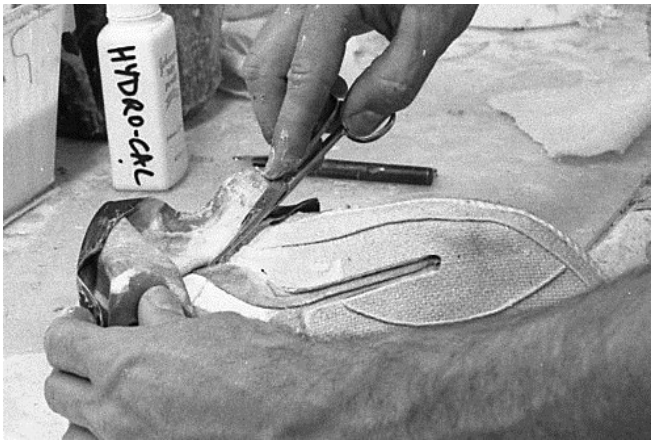
134 Hydrocal® is sprinkled onto the latexed leather.

135 Back of shoe is placed on heel leather.

136 Heel leather is pulled and stretched around back of shoe.

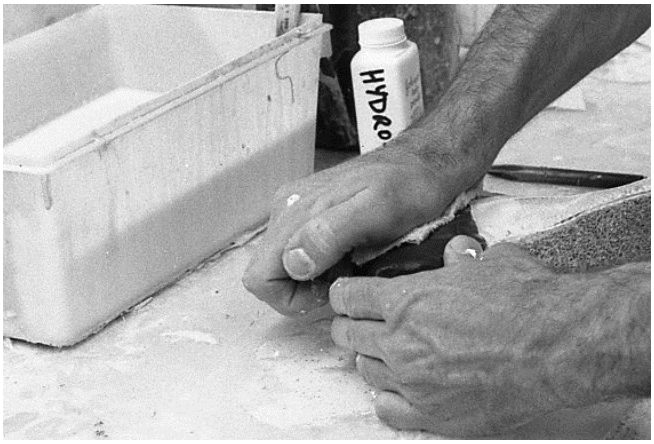


137 Front edges of heel leather are trimmed.

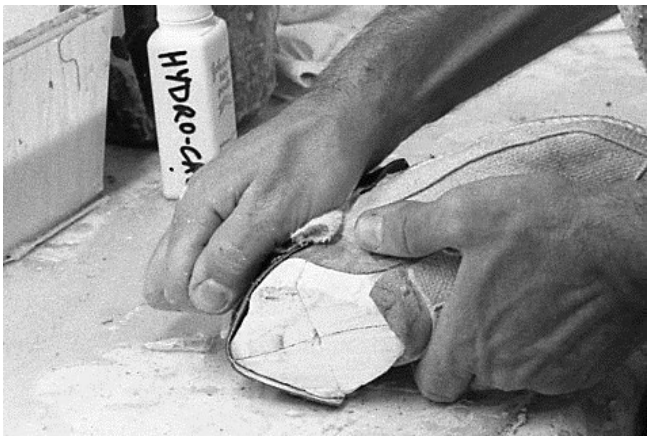


138 Ditto.

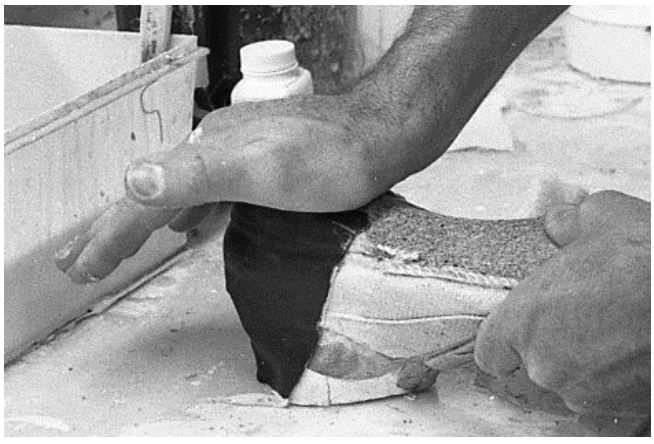
139 Bottom of heel leather is trimmed about 1/2" above base of shoe.



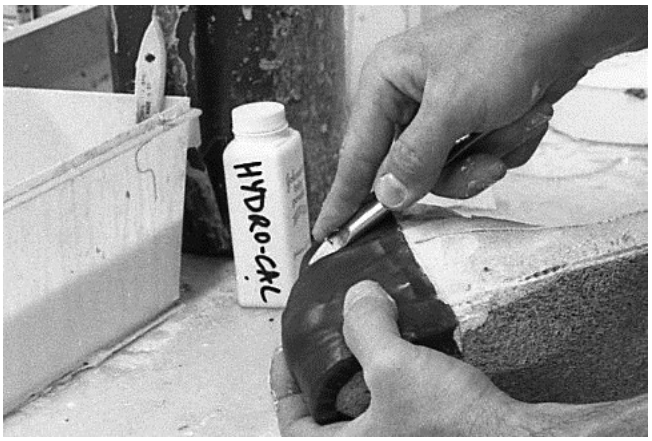
140 Heel leather is again hand molded.



141 Ditto.

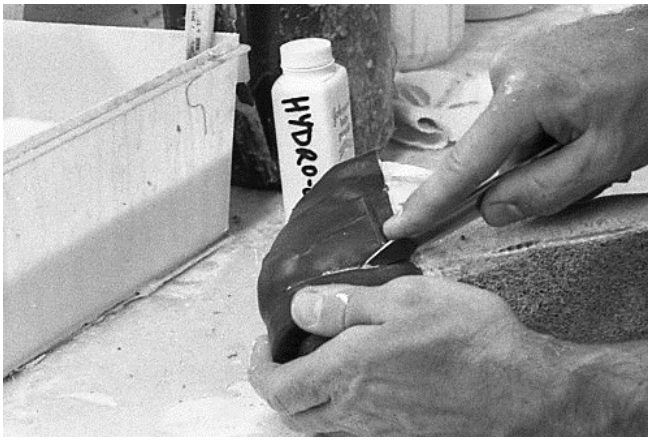


142 Bottom of heel leather is folded over edge and pressed to bond. If sufficient latex was not on base to bond, it would have been prudent to apply a little before folding over heel leather.

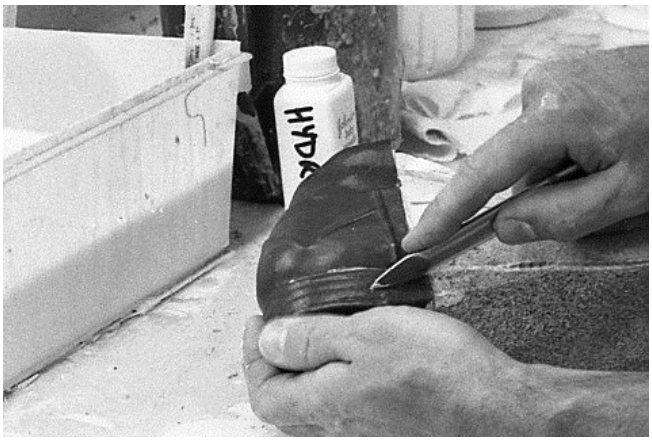


143 Leather is tooled with modified butter knife to form top edge of shoe.

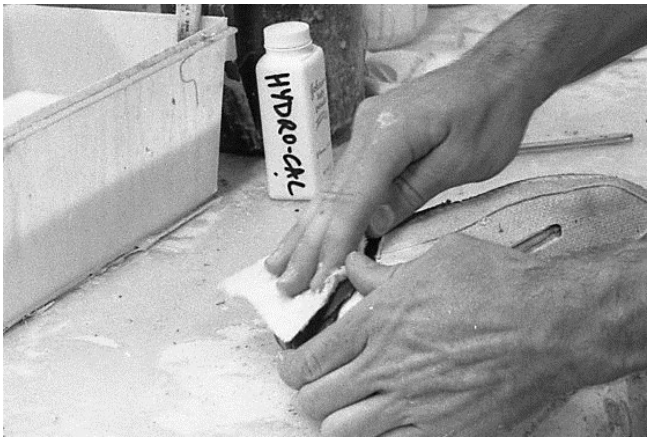
144 Leather is tooled with a forked or slotted point tool to press both side of leather against design cords.



145 Leather is tooled to make it conform with good bonding and design.



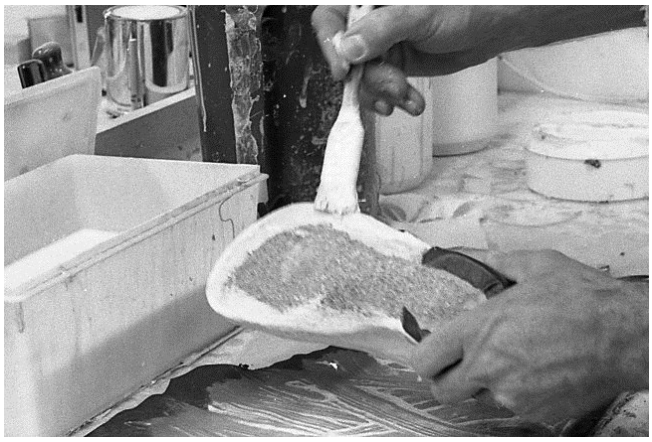
146 Ditto.



147 A rag is used to press leather into shape, and clean excess latex from surface in order to avoid staining of leather as it dries (especially light colored leathers).

148 Front leather is placed on glass with outer surface down and inside surface up. Latex is brushed onto leather.

149 Top front of shoe is latexed.



150 Bottom edge of base is latexed.

151 Leather is relatexed.

152 Hydrocal® is sprinkled over latex.

153 Leather is placed over shoe and center of leather is cut down to just above shoe top.

154 Leather is stretched, pressed, smoothed and molded to top of shoe.

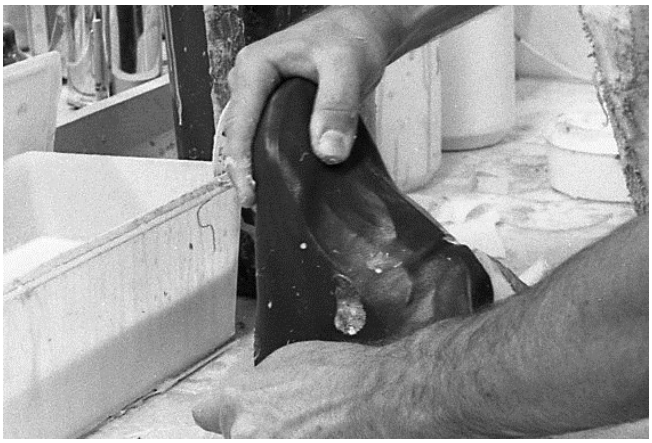
155 Ditto, and a rag is used to clean excess latex off surface of leather. Keep cleaning as you work.

156 Leather is stretched, pulled and smoothed along sides and down under to bottom of shoe.

157 Ditto, and pull it tight over and around top and front of toe box.

158 Tuck and fold leather under toe box and along sides.

159 Press and hold leather to get latex to bond.



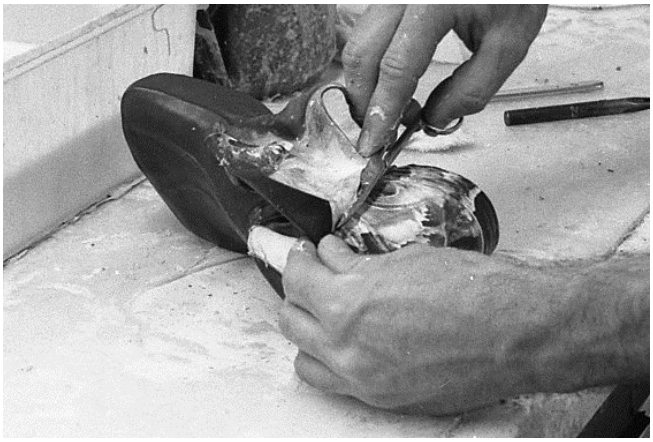
160 Keep pulling, tucking and folding leather toward back to beyond front seam of back leather.

161 Stretch, press and hold front leather. Keep working the leather as you mold it to the shape of the shoe.

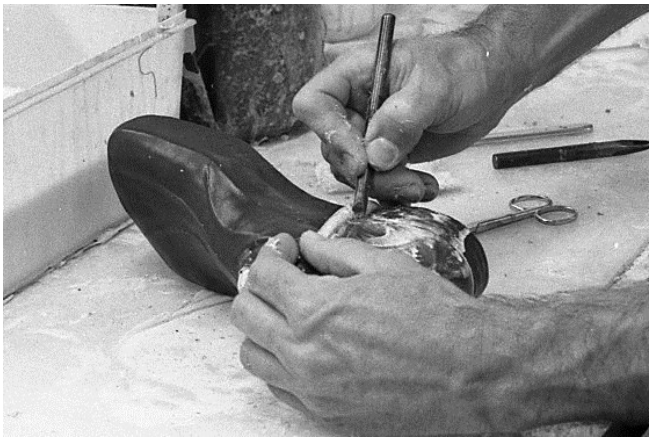
162 Clean excess latex from outer surface of leather and press out any air bubbles under leather.

163 Ditto.

164 Clean and help the bonding areas under the arch with pressure and time until the leather conforms to the contours of the shoe.

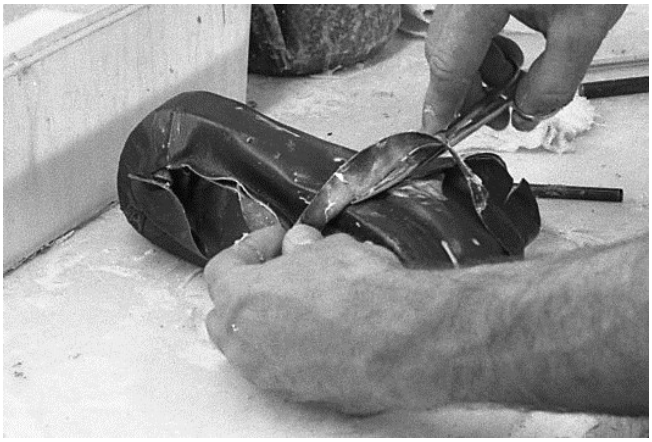


165 Medial side, trim front leather so it overlaps back leather by 1/4" to 3/8".



166 Use a scratching tool with 3 or 4 closely spaced needles to roughen the back leather, which will be under top or front leather when pressed and bonded.

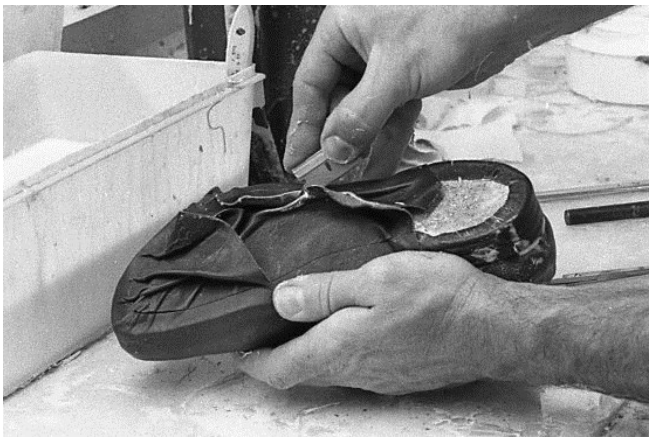
167 Press and hold front flap so it starts to bond to back leather.



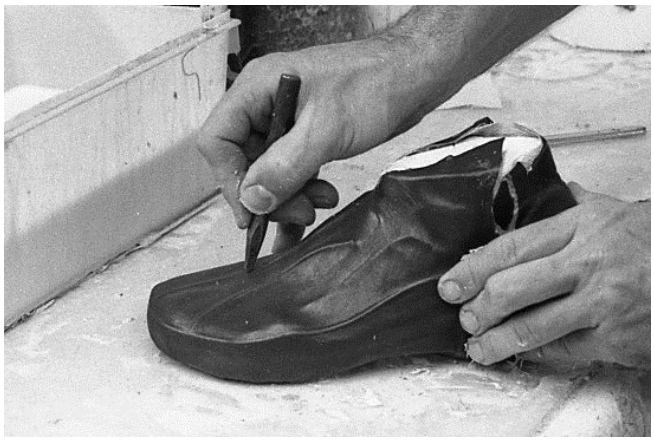
168 Lateral side, trim front leather so it overlaps back leather by 1/4" to 3/8".

169 Use a scratching tool to roughen back leather which will be under front leather when bonded.

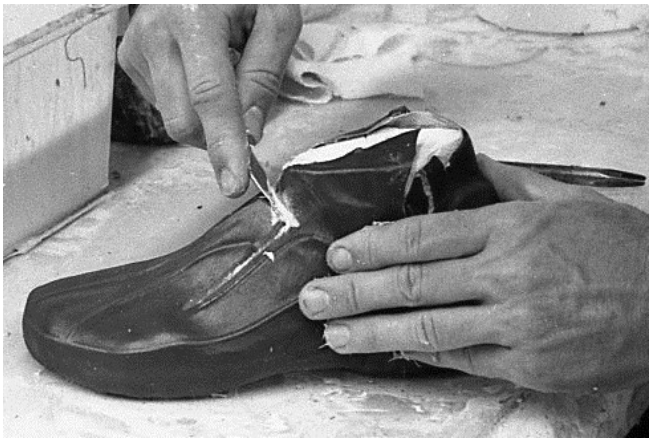
170 Press and hold front flap so it starts to bond to back leather.



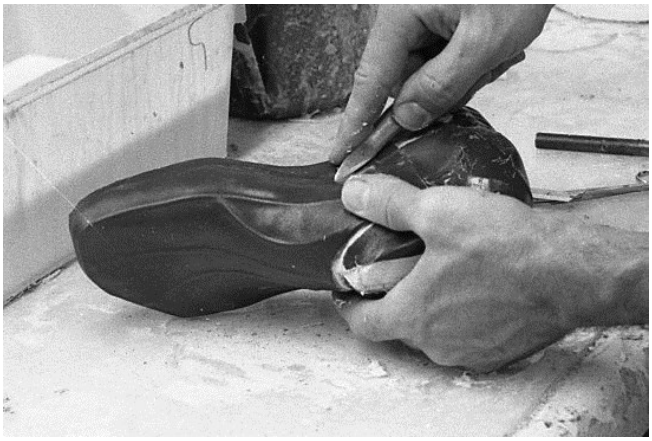
171 Cut excess front leather off bottom with a single edge razor blade. Leave about 1/4 to 1/2" inside the outer edge of shoe base.



172 Tool cords.



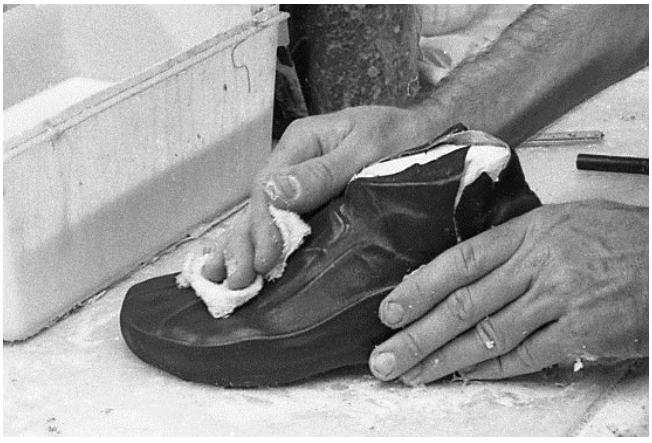
173 Use a modified butter knife to press in design (not sharp, but with a well rounded point and with smooth edges). The goal is to produce a good bond of the leather with no air pockets or voids under the leather.



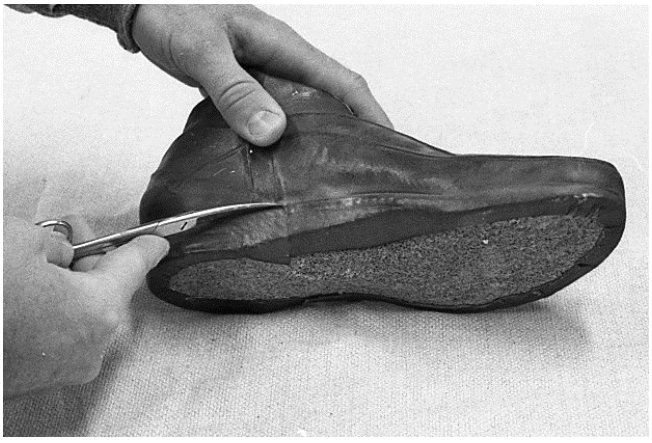
174 Ditto.

175 Clean, press and mold leather.

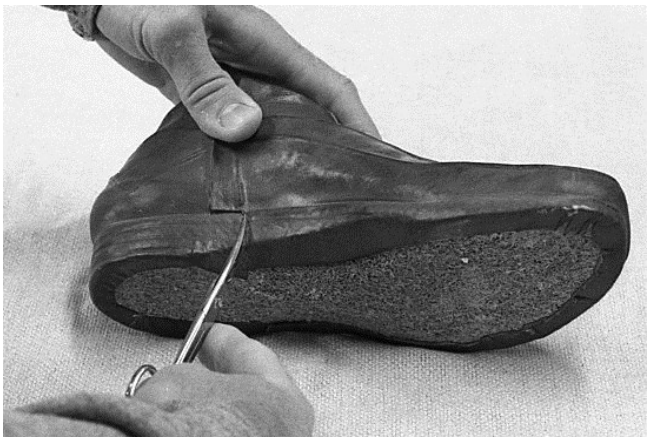
176 Trim and fold over flap of front leather to meet with a butt joint from base cords to underneath.



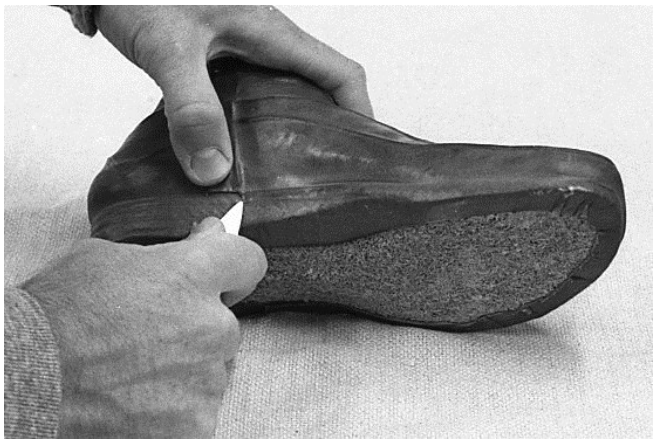
177 Press, mold and clean leather.



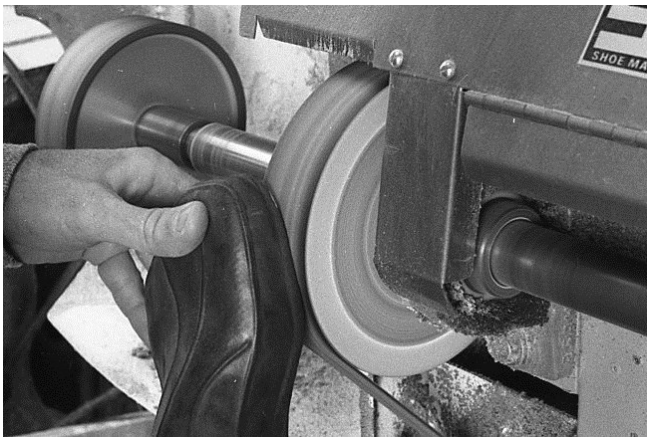
178 Trim bottom of front side seam at upper shoe and base design.



179 Cut butt seam at base.

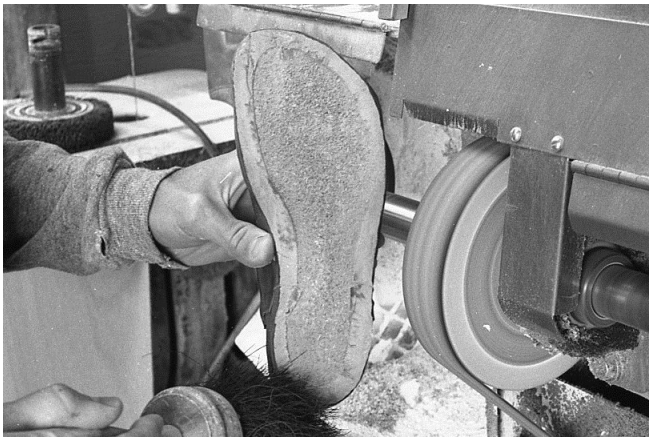


180 Press in edges of butt seam to make smooth. After a day of drying, this shoe should be ready for the next step.



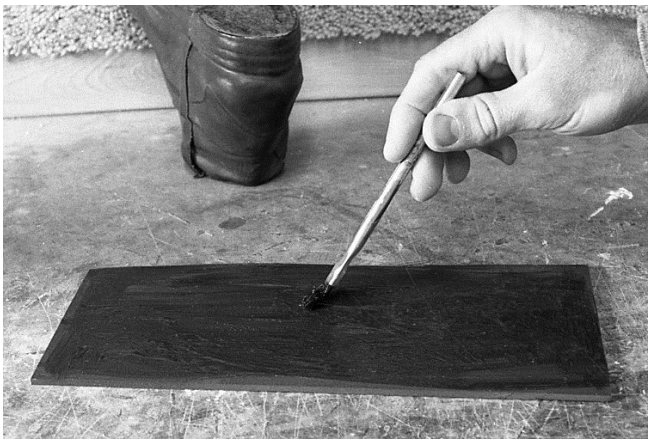
181 Carefully! Carefully! Sand leather at bottom of shoe nice and smooth.

182 Ditto.



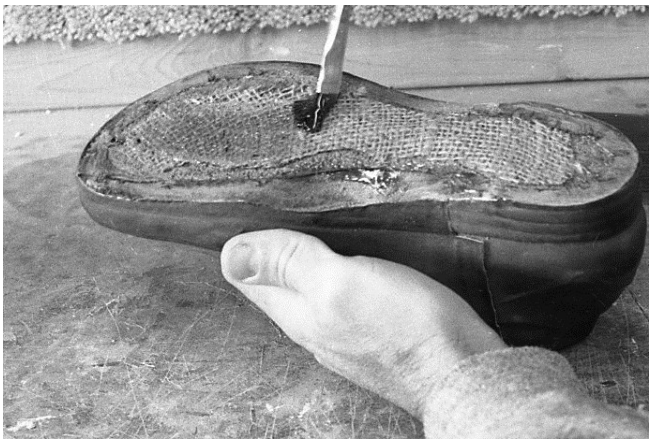
183 View of a good sanding of bottom of leather.

184 Apply a first coat of glue (Ubagrip®, Barge® or Reina Ortec®) to leather. Sometimes the glue needs to be thinned as it is too thick right from the can, especially as the first coat.

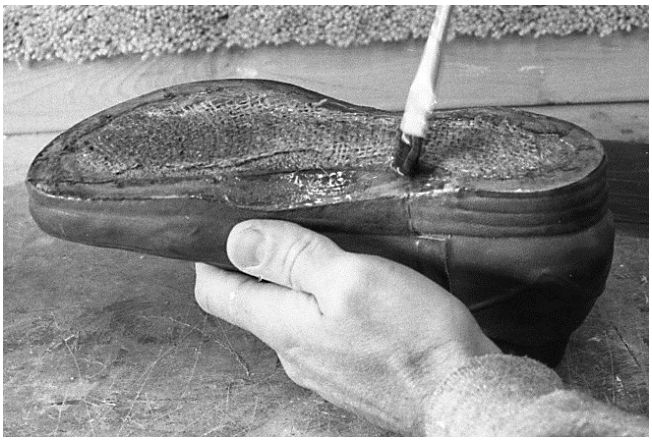


185 Apply glue to medium soft midsole (nitro, crepe, etc.). Usually a 6 iron thickness is used for ladies and a 9 iron is used for men. It also depends on the size and weight of the person etc.

186 Add one piece of burlap, cut to fit, to glued surface inside of leather.



187 Re-glue all of bottom of shoe.



188 Make sure glue is applied to corner edges of leather completely.

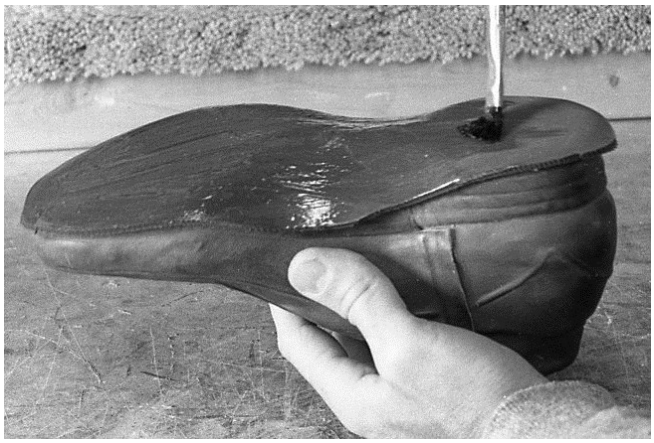
189 After glue (contact cement) is dry, place shoe on midsole.

190 Press together to make a strong contact and ultimately a very good bond.

191 Press together everywhere.

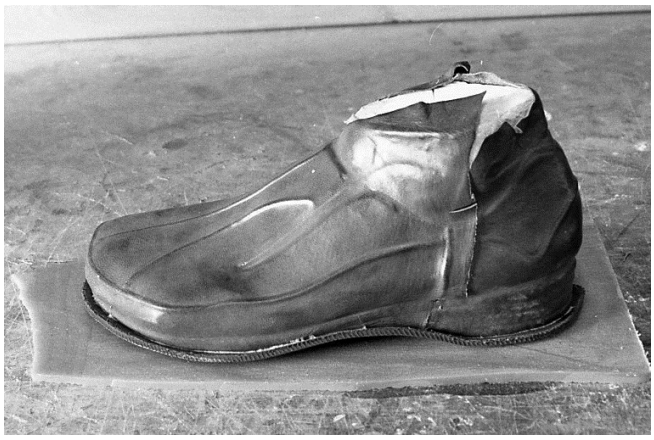
192 Use bench top to get a good press, especially in scalloped areas under medial and lateral arch.

193 Trim off excess midsole with cutting machine or hand held knife.



194 It is sometimes a good idea to let a few hours elapse before applying glue to midsole in order to attach outer sole.

195 Apply glue to outer sole and let glue dry to tack free or longer for a better bond. The strongest bonds will be when all of the solvents have evaporated away.



196 When glue is appropriately dry, place shoe on outer sole.

197 Press mid and outer soles together.

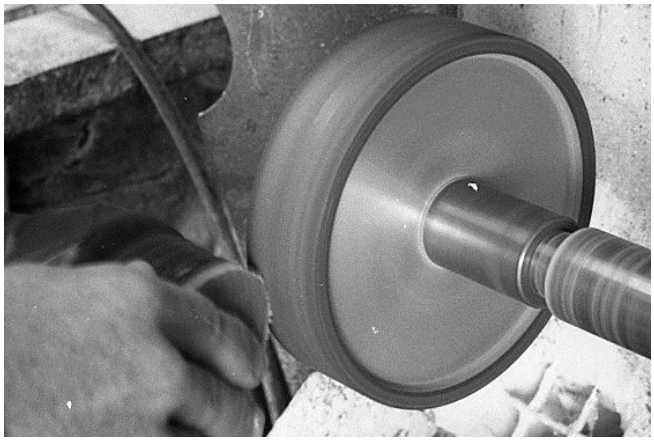
198 Ditto.

199 Trim off excess outer sole.

200 Sand away! But, you need good eyesight and hand coordination. Practice makes almost perfect!

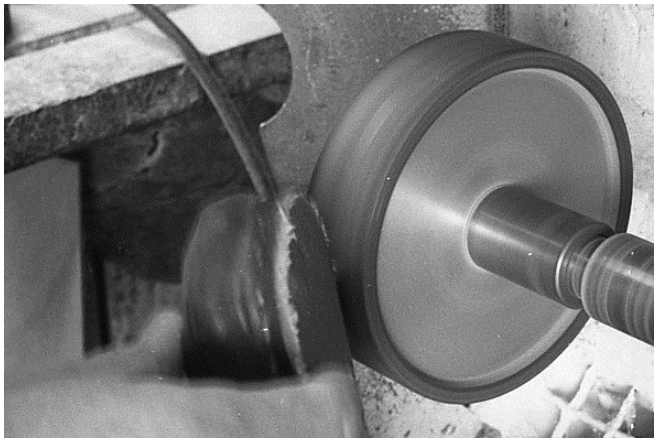
201 Ditto.

202 Ditto.

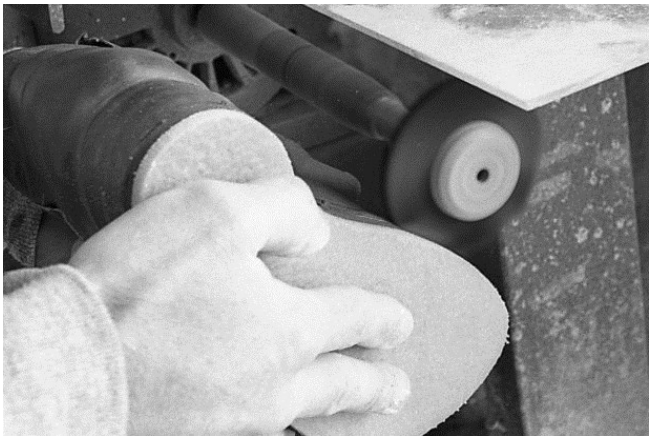


203 Ditto.

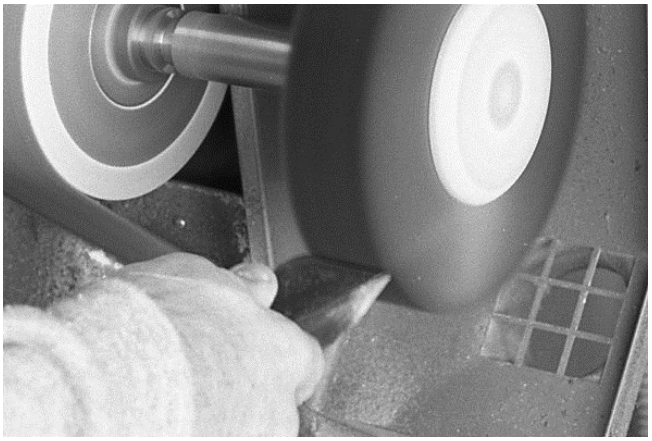
204 Ditto.



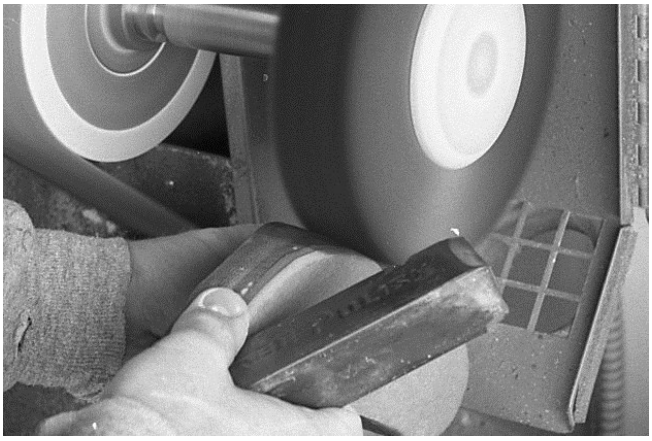
205 Bevel bottom edge to get rid of burrs or feathers.



206 Use dental lab wheel brush to clean "carefully" the union between mid-sole and leather for a clean well crafted look. I always use Cocker-Weber® brushes.

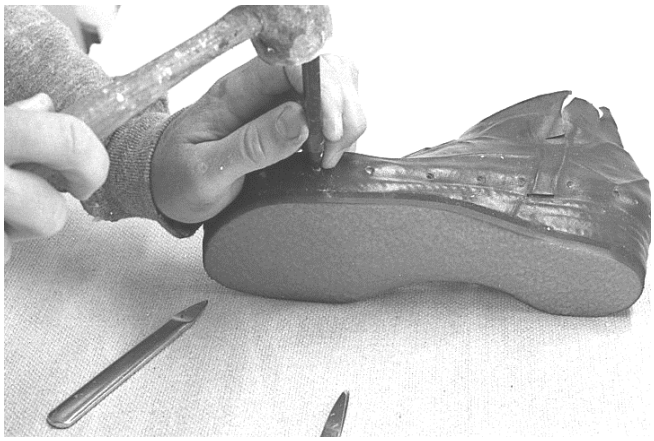


207 Polish shoe by using a hand application of Lincon® or Kiwi® paste wax polish and/or as pictured, a Renia® polish stick applied to polishing wheel.

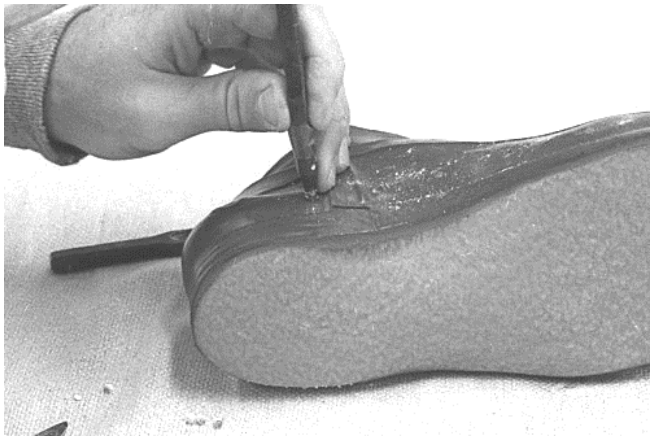


208 Brush polish onto and into leather and soling. Use only enough to get a smooth consistency of application.

209 Ditto.



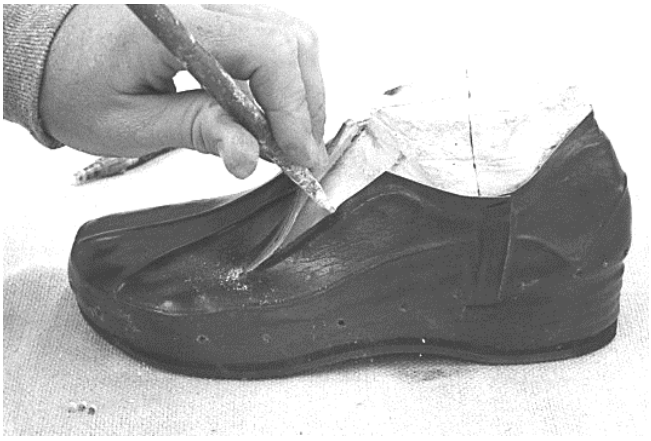
210 Punch in base perforations with a#3 punch.



211 Ditto.

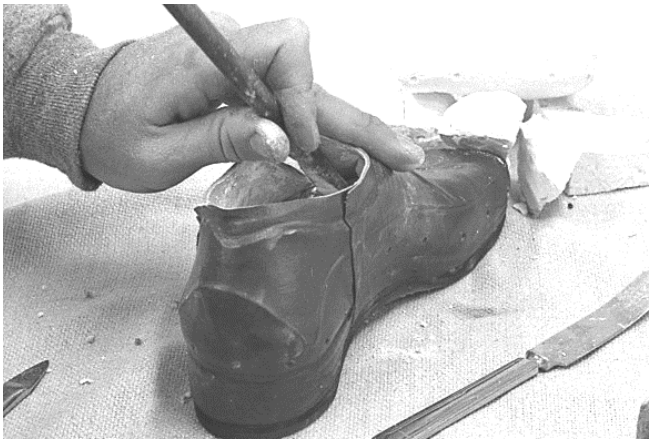
212 Punch bottom of lace opening.

213 Cut lace opening with single edge razor blade.

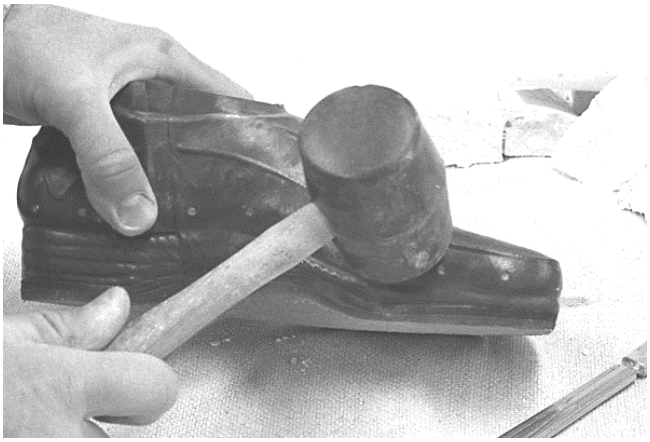


214 Use a good heavy duty, large size screwdriver and hammer to punch into and break last.

215 Pry out back section of last.



216 Break out front of last.

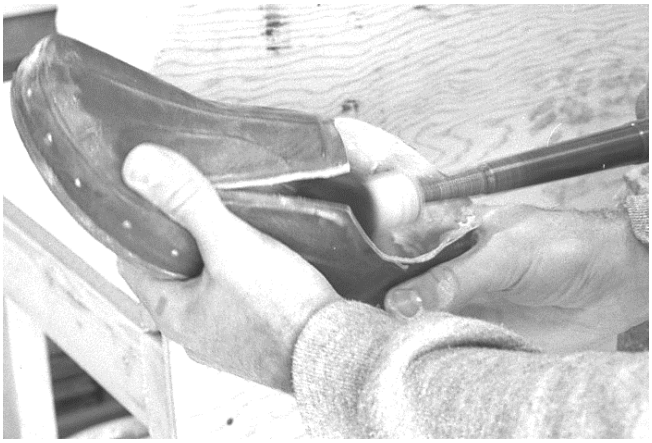


217 Because of process, last may have adhered to inside of shoe and it may need to be tapped and pried apart. Be careful if you think the cast is salvageable for reuse. The less damage to the last, the better it will be for reuse.

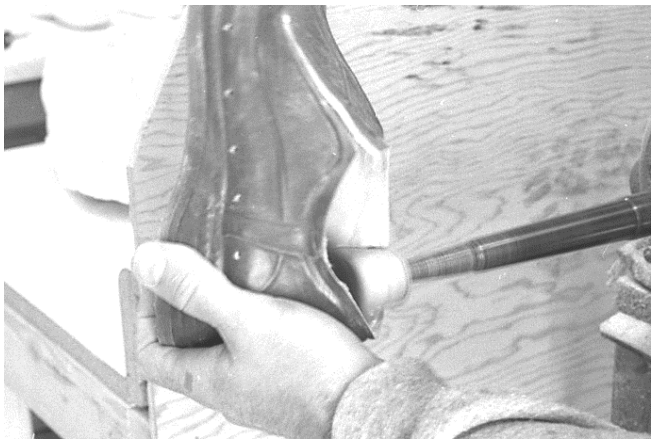
218 Ditto.

219 A butter knife without sharp edges is a very handy tool for separating and loosening many things.

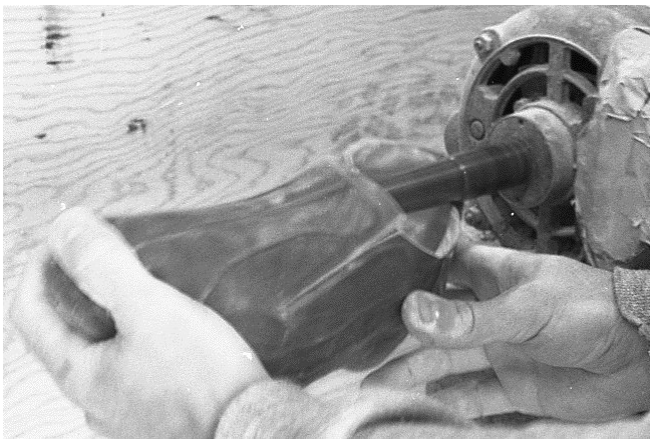
220 Scrape out with the butter knife any plaster or bits of the last from inside leather and sock.



221 Use a Cocker-Weber® toe brush to clean out inside of shoe. Cocker-Weber.com 1-800-497-4541. 13RC 2.5" cup brush 3 row "toe brush". And, B27 and B29 dental lab wheel brushes.



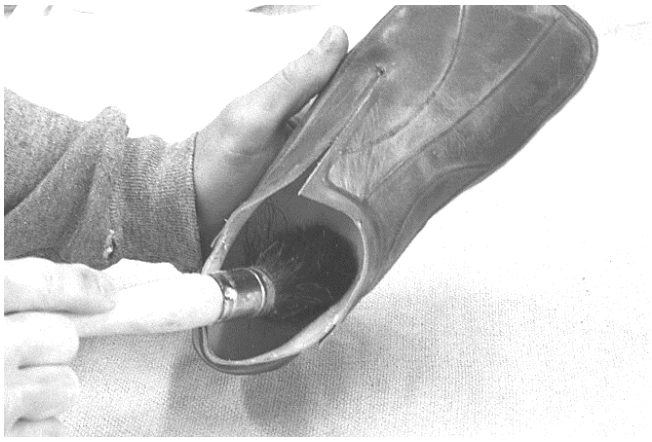
222 Ditto.



223 Ditto.

224 Add talcum powder to help the clean out and keep brush bristles from loading with latex and rubber cement.

225 Continue cleaning.



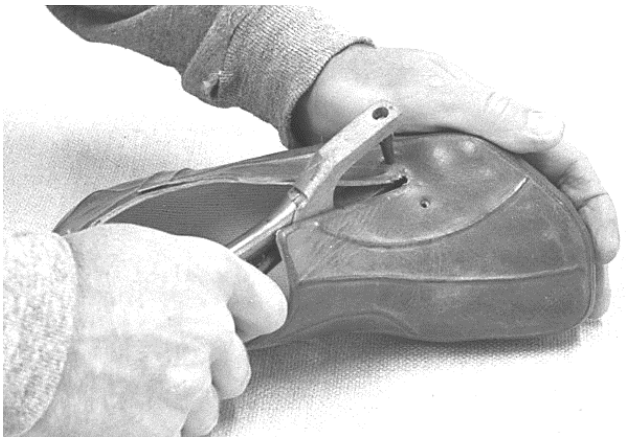
226 Use hand brush and/or compressed air to clean out all the remaining fine particles and dust.

227 Trim top of shoe with scissor.

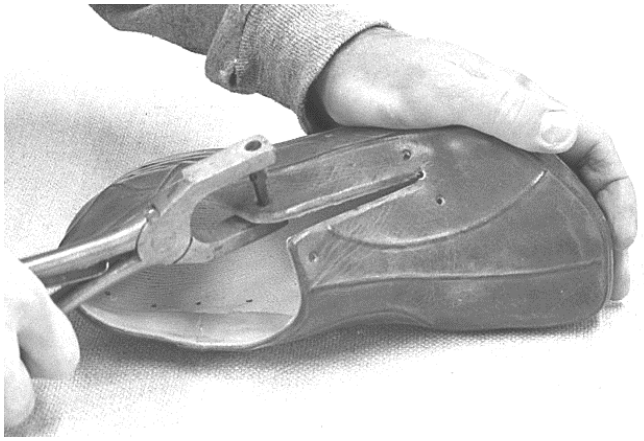
228 Ditto.

229 Trim lace opening

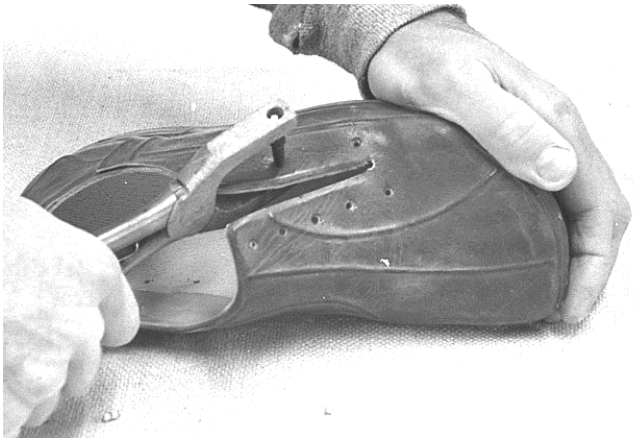
230 Ditto.



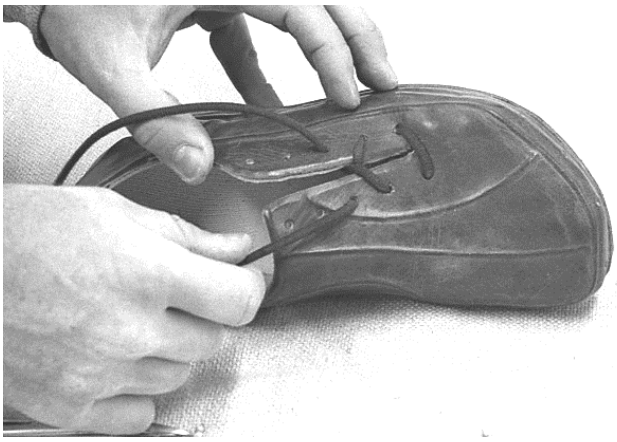
231 Punch lace holes with #3 punch.



231 Ditto.



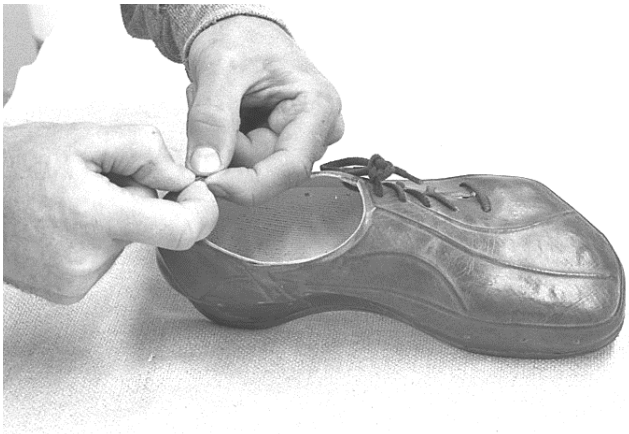
233 Ditto.



234 Put in shoe laces. Elastic shoe laces style #9247 (27" medium to large shoes, 24" small shoes, 36" low boots) made by Conrad-Jarvis Corp, P.O. Box 878, Pawtucket, RI 02862-0870, Tel. 401-722-8700.

235 Finished shoe laces.

236 Glue any shoe edges where inner and outer leather have not bonded together adequately.



237 Press glued edges together as necessary.

238 Use hand polish brush to clean up shoe.

242 Medial view of finished shoe.

243 View of back of finished shoe.

244 Lateral view of finished shoe.

245 Front top and lateral view of a beautifully crafted, traditional, regular weight shoe made to fit the foot. The art of making molded footwear to fit the individual wearer is something you can do.

LEATHER SOURCES AND RECOMMENDATIONS

Leather is a very good material for lining and covering footwear. Leather does have an individual personality associated with its origin. Leather has many attributes other materials do not have.

Overall leather seems to satisfy most footwear needs. The desires of the wearer will dictate what type of leather will be suitable. Generally, cow leather will be very satisfactory. The raw material, tanning processes and coloring are very important to the suitability of the end product.

The traditional leather bonding process demonstrated in this chapter works well with most leather. Some colored finishes, suedes and splits will require other methods of bonding.

The HIDE and LEATHER HOUSE located in Napa, California, USA, is the finest distributor of good quality leathers. They are one of the finest of businesses. They are courteous, efficient, knowledgeable, and reliable. www.hidehouse.com 1-888-hidehouse or 1-800-453-2847

The types of leathers they can supply for your footwear needs are:

Upholstery hides

Aniline cowsides

Butterball cowsides

Upholstery - chap and motorcycle cowsides

Lambtan cowsides

Ortho cowsides (for lining)

Plonge cowsides

Ecopell of Germany really tries to be socially responsible and environmentally friendly.

They produce beautiful leathers by natural processes.

www.ecopell.de

www.vegetable-tanned-leather.com