BOOT & SANDAL FABRICATION TECHNIQUES

CHAPTER 9

REPAIR & RESOLING - SPACE KENETIC, ICE SKATES & MISC.

REPAIR

The need for repair can be as simple as fixing separation of leathers, soles and leather, soles and resoling to the complexity of re-leathering and rebalancing of the entire shoe, boot or sandal.

The skilled artisan and craftsperson, with knowledge about the molded footwear fabrication processes, can literally take apart a pair of molded shoes, boots or sandals in fairly good condition and do wonders. They can un-bond almost everything, turn it inside out and turn it right side out again. They can put it back together in almost like condition without destroying the form and balance. Even the "mud" base can be patched or rebuilt.

However, the unskilled repair person, without proper knowledge of the molded footwear fabrication processes, will usually unbalance and destroy the fine attributes of the molded footwear products.

Once molded footwear becomes too old, rotten and distorted, it is no longer repairable. Just because a pair of shoes has been resoled 10 or 12 times doesn't mean it can be resoled forever. Old, worn out and distorted footwear may in some ways be comfortable, but it may not be making truly beneficial contributions to the wearer's body mechanics. Sometimes it is hard to convince the wearer that new footwear is more appropriate.

TOE HOLE PATCHES, BUMPERS and SEAM SEALING

A few common repairs are the fixing of toe holes, the covering of a heavily worn area, the re-bonding and the sealing of seams.

Most toe holes are caused from the lifting of the big toe and the rubbing of the toe nail from the inside. The placement of a small round leather patch placed inside while the glue is wet is one method. The edges of the patch should be beveled with a razor blade on a glass surface before the glue is applied. The use of SHOE GOO® placed inside is another method. These inside patches are the best, but sometimes outside patching is also needed.

Heavily worn areas on the outside can be covered by leather patches that can sometimes be sewn around the edges and/or with a bottom underlap tucked between the old leather and the mid sole. Another way is to use SHOE GOO®, FREESOLE® or fiberglass resin (in non-flexible areas) as a build-up or bumper. Gorilla® 5 minute epoxy works well in non-flexible and semi-flexible areas.

The coming apart of seams is usually caused by abrasion, the weakening of the adhesive and the entry of dirt between the materials. All dirt and debris must be removed before re-applying any adhesive. Then, applying FREESOLE® or other seam sealer along the edge of the joints will help to keep dirt and moisture from re-entering the seam.

RE-LEATHERING

Sometimes the shoes or boots are good inside but have sustained a lot of damage to the outside leather. The only proper way to begin the re-leather process is to take a cast out of the inside of the shoe or boot. The first step is to tape up the shoe or boot with masking tape in order to save the form.

Use a teaspoon of talcum powder evenly distributed inside to prevent the bonding of plaster to shoe or boot. Then pour plaster into the shoe or boot. Let the plaster harden about two hours and then remove the cast while the plaster is still moist. This form will not be perfect.

Usually the toe box will be 1/8" short, the vamp will be too full, so will the width across ankle and across heel areas. The cast will have to be hand modified according to one's own experience and judgment.

The next step is to remove all the soling and all the outer leather. Adhesive thinner is applied to the leather. The easiest way to remove the leather is to pick a side seam, hold it with needle nosed pliers and then roll the leather off. Keep applying thinner with a syringe. The leather may come off in one large piece or in many, many pieces. Do this work carefully so as not to rip the inner materials. The inner materials of sock, Monks Cloth and lining will stretch from the application of thinner and the pulling. After the outer leather is removed, let the shoe or boot dry. The inner materials will usually shrink back as the thinner evaporates.

Re-insert the last (the modified cast) into the shoe or boot. Clean up the outside of the shoe or boot and repair any part that needs to be fixed.

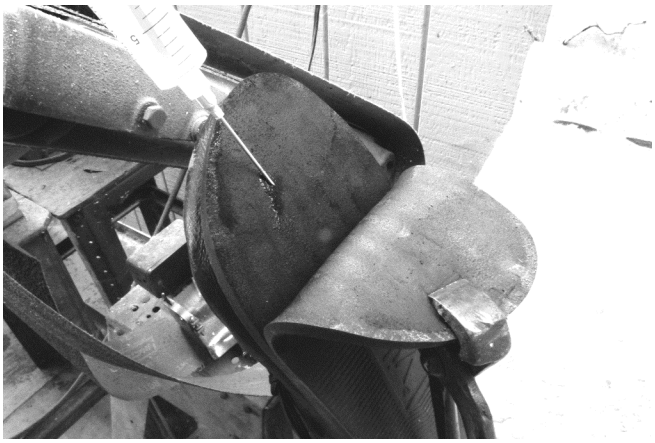
Then new leather and new soles can be applied. The tools and methods used for repair an re-leathering are the same as those used in the fabrication processes. The last is removed, the inside is cleaned and the shoe or boot is polished.

There is always the possibility that a re-leathered shoe or boot will not feel the same, or as good as it was, previous to the repair process. But, it is the only way to salvage or extend the life of some footwear. The processes take a lot of time. The value of time and materials is usually 1/2 to 3/4 of a new pair. WARNING: DON"T try to re-do old footwear that is badly worn, torn, rotten inside, or the base is really out of balance and appears distorted.

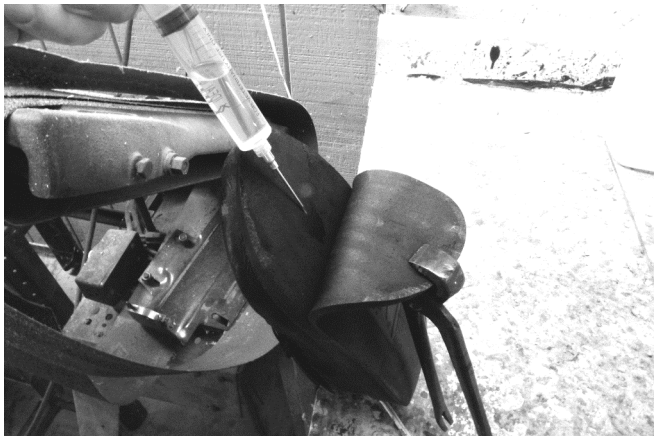
RESOLING

Resoling is the most common and essential repair to keeping molded footwear in good functional condition.

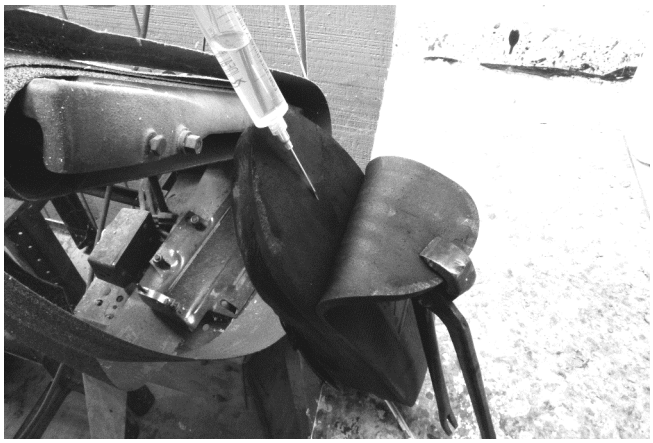
It is normal for people to wear out the outer soles unevenly. That is part of the nature of the human gait and the design of the marvelous human body. Therefore, resoling is necessary and it is beneficial to the wearer's balance and comfort.



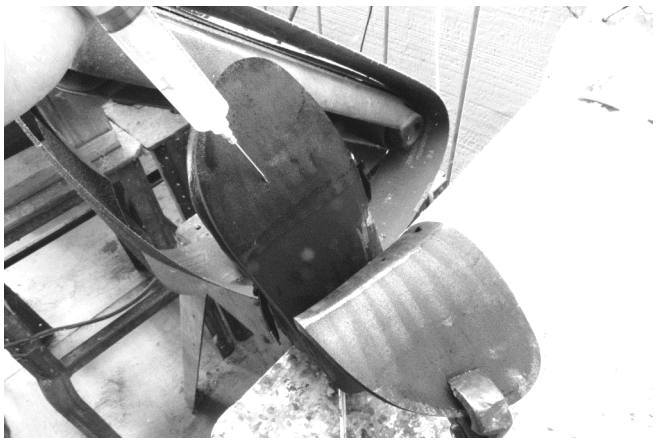
1 Using an adhesive thinner is usually the quickest way to de-bond a sole. The easiest method of application is with a veterinary syringe and needle. Use nipper or pliers to hold and pull apart the materials as the thinner releases the bond.



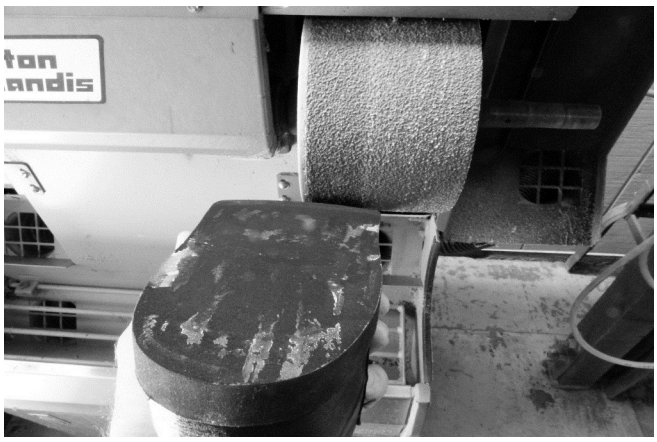
2 Ditto. Not all thinners work well with every type of adhesive. Sometimes acetone will work, but it is not my first choice.



3 Ditto. This shoe has been placed on a blunty sanded 1" X 3" stick that was nailed or screwed to the side of work bench and rises about 9" to 12" above the top of the work bench.



4 Some old soling materials will not de-bond. They just tear apart. Sanding with the rough grit belt is the only way to remove these materials. You must sand carefully so as not to cut into the mid sole and heel wedge materials.



5 The bottom of the mid sole and heel wedge is sanded carefully to remove excess glue, dirt and left over parts of the outer sole material. Bad and poor sanding techniques can destroy the balance and levelness of the footwear.

6 Carefully fine sand at the outer edge corner so to make it clean and sharp.

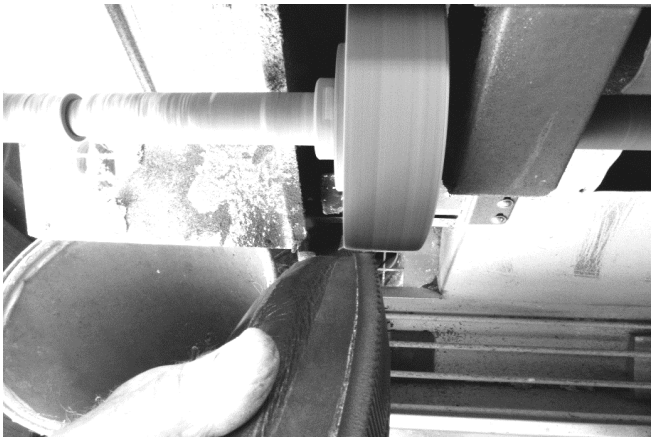
7 Sand top of outer soling if necessary to clean dirt, dust and grime which will interfere with good bonding. Blowing off with compressed air just before applying adhesives is a good habit.

8 Applying adhesive to bottom of shoe and outer sole. Contact cements have an open time (wet time) and need to become tack free (not sticky to the touch). Some adhesives perform better if re-heated.

9 When the adhesive is ready, carefully position the shoe over the outer sole and then place it onto the outer sole. If you make a mistake in placement, you need to remove the sole. Go back to picture #1 and use thinner to de-bond it.

10 The excess outer soling is trimmed with a simple trimming machine or a sharp trimming knife.

11 The outer edge of soling is carefully rough sanded. Many workers at shoe repair shops are not good sanders. Quality sanding takes good hand and eye coordination. It is not the time for multi tasking or listening to the voice box.



12 Carefully fine sand the edges. Good lighting is a requirement for good sanding. Small task lights properly positioned are really helpful.

13 Remove the edge feathers by lightly, very lightly sanding at a slight angle and usually go in the opposite direction.

14 Apply polish to leather. Lincoln® or Kiwi® paste waxes in cans are still the best.

15 Polish shoes with a shoe polish brush by hand or with a machine.

16 The use of Renia® polish sticks is really good. These sticks have more hard carnauba wax with less solvents. This wax will compliment the softer paste waxes by giving a higher shine and longer lasting shine.

17 The polish brush is a tool that produces better results with better operator techniques. You will learn those techniques with practice.

18 The pressure of brushing and the direction of brushing is all important in getting the best results.

19 Brush the sole too. Finishing with a hand brush, and sometimes a soft cloth, with or without a slight amount of moisture, will help to produce a superior shine.

20 The resoling is complete. And, if you let the shoes sit overnight and not in the sun during the daytime the bonding will cure better and become stronger.

SPACE KINETIC

The Space Kinetic is a cross between a shoe and a sandal. The tension of elastic laces holds the shoe on the foot. The idea is that with many cut outs and elastic laces, this shoe will be very flexible. The Space Kinetic is somewhat self adjusting as the wearer moves the foot.

Some people really enjoy this sandal and like the feeling which allows for a lot of freedom for the foot. However, some people never get use to this design. They find it not as comfortable and supportive as a regular MURRAY SPACE SHOE®.

The tension adjustment of the elastic laces is critical to the function. Nobody can properly adjust this tension except the individual wearer. The wearer must have the patience and persistence to adjust the proper tension in the beginning. The lace tension also needs to be kept in adjustment as the laces age.

The story behind this design is that Danny Kaye wanted a pair of really comfortable shoes and he wanted the appearance of being barefoot as he performed the Broadway play "Two by Two". This design was a collaboration developed by Danny Kaye himself, Mrs. Murray and an industrial designer who's name I have never heard.

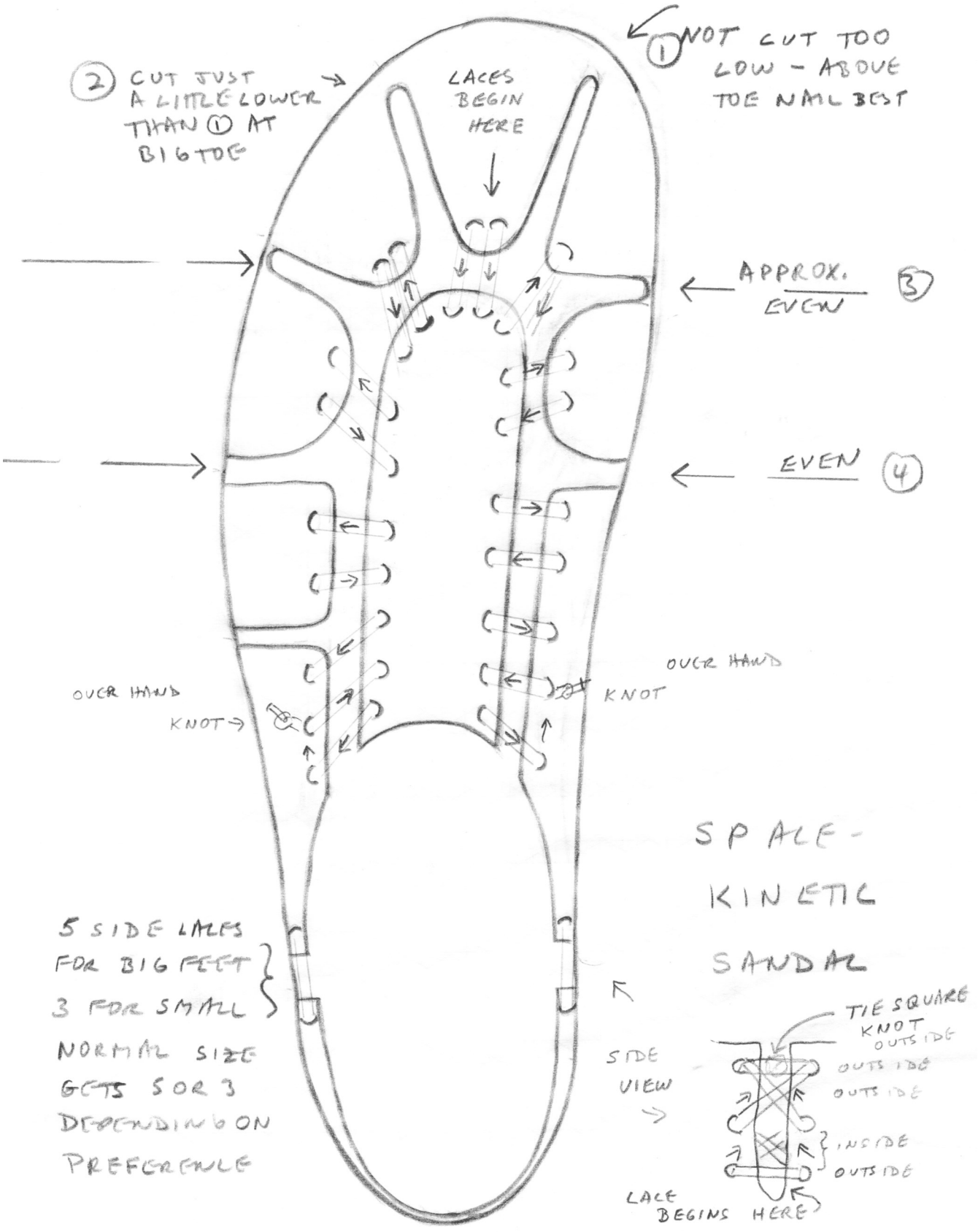
The space kinetic fabrication process is the same as all molded footwear previously described. The ultimate design depends on the skill of the artisan to understand the uniqueness of the wearer's feet. The designer needs to be able to position cut outs in the best location for the wearers feet. The lacing system can be modified somewhat but too much compromising may reduce the effectiveness of the elastic.

Matching the design to the feet and matching the design of both sandals can be a frustrating task. The best answer is for each person to learn to make their own molded footwear.

If you really want to experience the feeling of this particular style of footwear, you should make a pair for yourself. The comfort of this style can be outstanding. You may want to wear them almost all the time.

A beautiful space kinetic in suede leather.

A pair of beautiful space kinetics in an aniline kid leather.



ICE SKATES

Ice skating is at the beginning of the moulded shoe and MURRAY SPACE SHOE® story.

Mr. Murray was an accomplished professional ice skater and instructor. I have heard that he was pretty good.

Apparently, quiet a few ice skaters who studied under him became associated with the professional ice skating shows of the time. Ice skating was a sport or vocation that he loved very much. He must have been good at the "figures and dance".

I met Mr. Murray in the late 1970's when he was an older man. The visit was very short. I really don 't know much about his personal story. However, he wrote a book "Shoes and Feet to Boot". It was privately printed. Copies can sometimes be found from used book resellers.

His ice skates began to hurt his feet. He looked and looked for a solution. He decided to make his own ice skates and shoes. After sitting in a dentists chair, Mr. Murray decided that he could make an impression of his own feet and mould a shoe (and ice skate) to his own feet. His first success was a metal foot slipper type of ice skate which he exhibited at Madison Square Garden Ice Rink. You can read his book for more of the story.

His inventiveness ultimately helped a lot of people. He was the originator of moulded footwear. He took the world by storm, with the help of others, because that is what New York city, the Atlantic states and much of America needed at the time. The population worked and walked. Much has changed since then. But luckily, the process has survived. Now you can learn the knowledge necessary to make your own molded footwear.

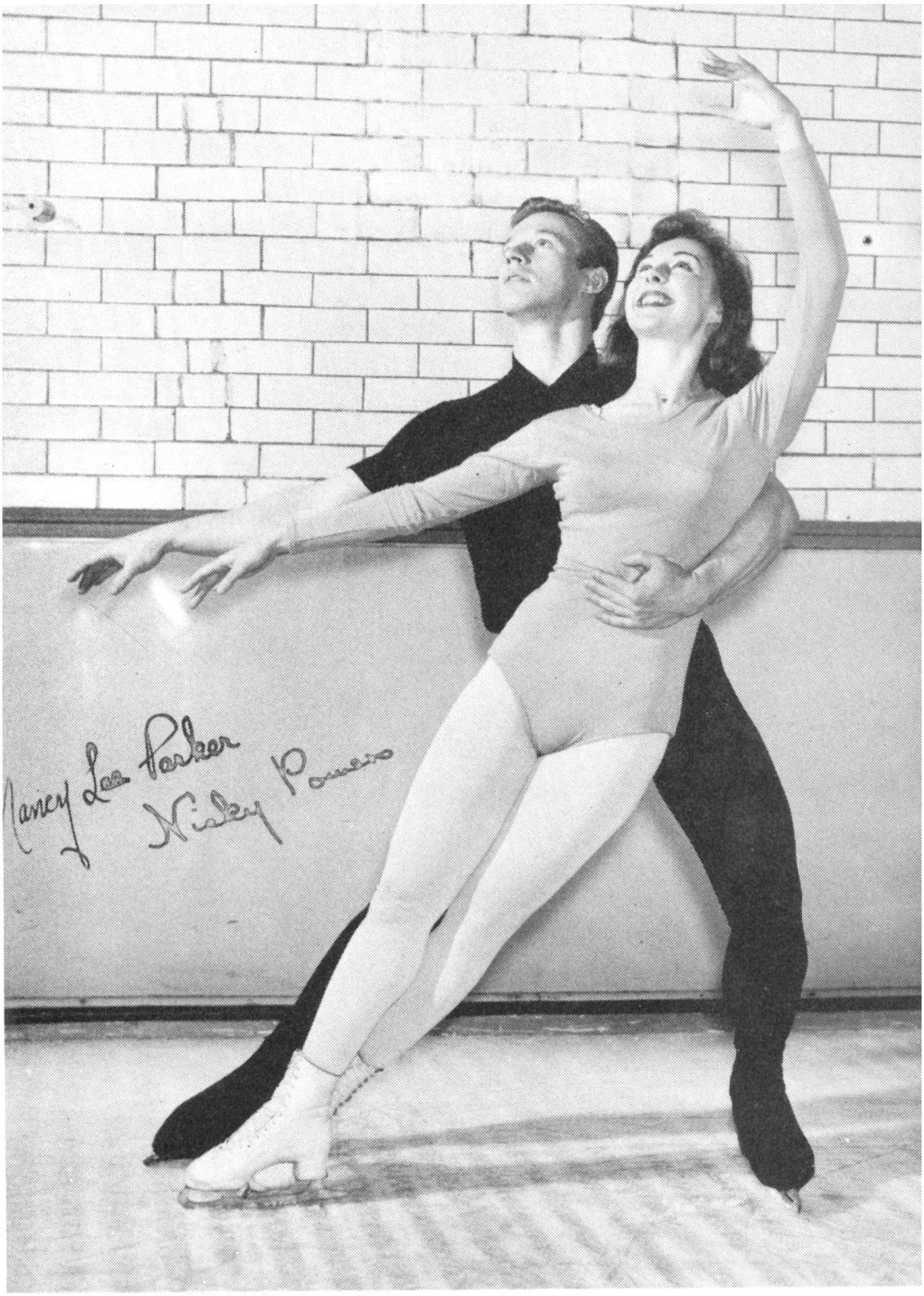
I was never taught how to make ice skates. I was never an ice skater. I learned the ice skate making processes from Mr. Murray's patents and by dissecting several pair of old ice skates made by Mr. Murray.

I did make my own ice skates according to the patents. I did wear those ice skates many times as I learned the art of falling on ice. Figure skating is pure fun! If you are inclined to enjoy figure skating, I recommend that you make your own molded ice skates. They just might make your ice skating more thrilling than ever.

My first pair of shoes and boots were ordered in the early 1960's. They were made according to the Murrays' directions and processes by their very skilled employees. I still have them to this date.
The craftsmanship was superb.

Those shoes and boots induced me to stay with Mr. Murray's concepts and footwear philosophy for the rest of my life.

The molded ice skates are a little more complicated than molded shoes, boots and sandals. Instead of walking on a flat surface ice skates have to be properly balanced on a blade. Read the patents carefully in order to understand his method. Think about the balance issues thoroughly. Then proceed with the knowledge you have gained in fabricating shoes, boots and sandals.



Nancy Lee Parker and Nicky Powers, skating stars of Song of Norway, the Roxy Theatre, Club Lido, Paris etc., snapped as they practice at Murray SPACE Shoe Ice Rink, Castle in SPACE, 213 W. 58 Street, N.Y.C. Circa 1950's or 1960's

Winter activities have always been an important part of New England life.

Ice skating and skiing have always been popular for those who had the time.

A MURRAY SPACE SHOE ski boot, ice skate of Nancy Lee Parker and ice skate of Nicky Powers.

Circa 1950's and 1960's

Ice skates made by the author

United States Patent Office 2,904,902 Patented Sept. 22, 1959

2,904,902

SKATING SHOE

Alan E. Murray, Bridgeport, Conn.

Application October 25, 1957, Serial No. 692,414

3 Claims. (Cl. 36—2.5)

This application relates to shoes designed for attachment of skates having flat plates of the type that are screwed or riveted to the shoe and to a process of producing the same, and is a continuation-in-part of my earlier application Serial No. 372,685, filed August 6, 1953, now abandoned.

Broadly speaking, in making the shoes of the present invention, casts are made of the wearer's feet, which casts may be made in any desired manner as shown in my earlier Patent No. 2,120,987, dated June 21, 1938, and in my copending applications Serial Nos. 621,226 and 650,924. On such a cast a molded shoe liner of felt impregnated with latex is formed so that it will exactly conform to the wearer's foot. These liners completely cover the feet and run up around the ankles high enough to give the support which skaters ordinarily demand. Outside of these liners I build up a virtually completely rigid structure which runs under the soles of the wearer's feet and up around and over the toes and around the heels. These cups are formed of a plurality of layers of moldable plastic material such as a cellulosic ester; for example, cellulose nitrate or cellulose acetate which are molded over the liner and are virtually united into a single piece, as by the use of a solvent. By having a plurality of layers, added stiffness is given to the structure which embraces and holds the foot firmly and closely but substantially without any flexibility whatsoever.

Outside of these cups and liners I preferably have a covering layer and finally build up the heel and sole portions under the forward part of the foot to form flat platforms to which the steel plates of the skates may be screwed.

By this construction I have the comfortable fitting liners which hold the user's feet firmly down into the rigid cups and have the rigid cups which follow the contours of the sole of the foot and give the foot the support and stiffness which is of great importance in a skating shoe. The shoes which I produce are so rigid that it would be virtually impossible to use them for ordinary walking but inasmuch as they are to be screwed to the steel plates of a skate, this rigidity is desirable.

The exact nature of the shoes and the way in which they are made can be readily understood from the following illustrative example, reference being had to the accompanying drawings, in which—

Fig. 1 is an elevation of my shoe attached to a skate with a part of the heel broken away to show details of construction;

Fig. 2 is an elevation showing the way the shoe is built up on a cast;

Fig. 3 is a view similar to Fig. 2 showing a further step in the construction;

Fig. 4 is detail showing the heel construction, and

Fig. 5 is a bottom view showing the heel in place but with the flat platforms for attachment of the skate not added.

In making the shoe of my invention, I attach to the

cast 28 at the top line of the shoe to be made, a horizontal rear edge liner 34 of soft leather and then attach to the front of the cast 28 a front leather edge liner 35 having wings 37 of the same vertical dimension as the rear edge liner 34 so that said wings produce abutting joints with the ends of the rear edge liner 34 as shown in Fig. 2. Next I put on to the bottom of the cast 28 a monk's cloth sole-piece 38 which extends under the whole bottom portion of the cast and up all around the same to just below the top of the undercut line as shown in Fig. 2.

The sole-piece 38, being made to adhere to the cast 28, is made with thin or thick latex as described in my Patent No. 2,493,310. This is applied wherever the sole-piece 38 contacts the cast. Then I apply to the cast a soft overall cover-piece of monk's cloth 39 shaped as shown in Fig. 3, so that the front edges form an abutting joint 39a over the top front of the cast, tucks being made and cut off below the sole-piece 38 to which some thick or thin latex, also some plaster of Paris, is applied. Now I apply over the overall cover-piece a thin 1/16" thick felt-piece 40 for smoothness and warmth. This member 40 is initially of a general horseshoe shape and runs around the back of the heel and with the meeting edges over the front of the shoe. It extends down underneath the bottom of the sole-piece 38 forming front and rear puckers underneath the cast which are cut off to produce meeting edges. For this purpose the felt-piece 40 as well as the overall cover-piece 39 with which it contacts will be impregnated or coated with thin or thick latex, some powdered plaster of Paris being applied to the latex if desired. I then apply to the bottom of felt-piece 40 a felt-piece 41 for cushioning and warmth, this piece being about 3/16" thick and of the same shape as the sole-piece 38. It extends up on the sides and back about as high as the sole-piece 38 making a joint with the felt-piece 40. This likewise is attached with latex, with or without plaster of Paris and should be pressed up against the cast to conform to the under surface of the cast. The edges of pieces 40 and 41 can be tapered if desired when being applied. The shoe is then dried for about two days and the exposed surfaces of the pieces 40 and 41 are brushed off to leave them clear for attachment of the rigid cups which are a feature of my invention.

It will be noted that at this stage in the manufacture of the shoe I have a complete shoe-like member which exactly conforms to the shape of the foot and will have a cushioning contact with the foot.

I now form around the bottom part of the soft shoe-like member a rigid cup which will conform to the shape of the foot to embrace it firmly but will not allow of any appreciable flexing. This cup is made up by soaking sheets of cellulosic material in solvent so that they become soft and readily moldable. Such cellulosic material may be either "self-sustaining"—that is sheets which are not reinforced, or they may be in the form of loose fabric impregnated with the cellulosic material. For example, I have found it advantageous to use a material available on the market called "Celastic," made up of plasticized nitrocellulose carried in a loose-weave cotton-pile fabric. This material has the appearance of blotting paper before having a solvent applied thereto. Such material is soaked in a so-called solvent which actually swells and softens the material rather than actually dissolving it. It then becomes plastic and can be molded to the desired shape. The sheets of plastic are cut to approximately the desired shape and then put under the cast and the shoe body already described and pressed firmly up and around the cast and up over the sides and up under and around in front of the toes. The first sheet applied designated by the numeral 42 may come up high at the heel to the area behind

the ankle bone to provide a stiff counter member and perhaps a little more than half way up the toes as shown in Fig. 1. Between the toes and heel the first sheet is applied to extend up substantially above the undercut line at each side of the foot to envelop and support the curved portion of the foot along each side and the top edge of the sheet dips slightly down to pass immediately below the ankle bone of the foot. When this sheet is in place and while it is still softened with the solvent, a second sheet 43 is applied which does not come up quite as high. As best shown in Fig. 1, the top edge of the second sheet approximately follows the undercut line at the side of the foot which coincides with the point of maximum breadth of the foot but in the rear this sheet extends above the undercut line to reinforce the counter member. Finally a third sheet 44 is also added which is still lower on the outside. The top edge of the last sheet extends upwardly from the sole to envelop the bottom curved portion of the foot but the top edge stops just short of the undercut line of the foot These three sheets are firmly pressed together and when the solvent dries out they form a rigid integral cup which has almost the rigidity of metal but which exactly conforms to the user's foot and is fully lined and cushioned by the shoe member about which the cup is formed. It will be noted that the natural stiffness of the sole portion will be reinforced by the integral upturned sides. As the sheets do not all extend up the same height, some slight lateral flexing is permitted at the top, but these portions will be highly resilient and spring back to shape to support and contain the foot of the wearer. The members 42, 43 and 44 may be cut to desired shape but ordinarily it will be found preferable to have some excess material and trim off this excess material with a razor blade after they are molded into position.

A heel 45 is built up with a number of layers of the plastic material softened by the solvent to give the desired heel height. As the shoe is to be mounted on a skate blade 46 carried on front and rear plates 47 and 48, it is necessary to have the front of the shoe built to conform with the front plate 47 and added plastic material is used for this purpose as indicated at 50. It will be noted that this platform replaces the usual sole on the shoe and gives the greatest attainable ice clearance laterally, but at the same time fully supports the plate 47.

Around the top of the shoe and extending downwardly around a V-shaped cut-out 53 to be made within the edge liner 35 I apply a cord 52 of cotton or other fibers which is attached with latex. Similarly a cord 54 runs around the bottom of the shoe as shown in Fig. 5. This cord will be embedded in the material 50.

As an outside cover for this shoe I apply a piece of soft leather 55 such as kid or kangaroo which covers the whole shoe without any seam at the back, the meeting edges being at the two cords 52 and 54 and down to the rear edge of the heel 45 and up to the breast or front of the heel 45. Where the leather 55 meets the cords 52 and 54, one leather edge can abut the cord and the other leather edge can be skived and extend just over and beyond the cord ⅛" to ¼". If desired, a flat leather heel-piece 56 may be cemented under the heel 45 and a flat leather-piece 57 may be cemented under the platform 50 to contact the skate plate 47. A further leather-piece 58 can, if desired, be cemented to the breast or front of the heel 45. All these leather pieces may be applied

to the shoe with the aid of thin latex and thick latex and powdered plaster of Paris in accordance with the leather technique set forth in detail in my Patent No. 2,493,310, dated January 3, 1950. Preferably they should conform to the shape of the plates 47 and 48.

A slit or cut 53 is now made down the front of the shoe between the arms of the cord 52 and the shoe is cut off at the top to within about 1/16" of the cord 52. The shoe is now substantially shaped and the cast can be removed by breaking it out if necessary. Finally the shoe is brushed out and cleaned and the eyelets 53a are inserted. If desired, a tongue 59 is formed over the cast and inserted in the shoe. This tongue preferably is made up of two pieces of leather 60 and 61 with a narrow piece of felt 62 between them. If desired, the shoe may be provided with a plurality of cut-out V-shaped notches between the eyelets to facilitate bending the ankle while skating.

By this construction I produce an integral shoe which exactly conforms to the sole of the foot of the wearer and is softly cushioned on the inside and runs up to give support to the wearer around the ankle but which is held under the wearer's toes and sole and about the heel so that an absolutely firm contact is had with the wearer's foot. The added platforms prevent this shaped contour from being distorted when the skate is attached to the shoe as by screws 49.

What I claim is:

1. A skating shoe comprising a soft cushioned shoe body adapted to closely embrace the wearer's foot and run under the sole thereof and shaped to follow the contours of the foot, a rigid cup member made of a plurality of plies of resilient material united into an integral structure forming the bottom part of such shoe outside of said cushioning body, which conforms to the shape of the wearer's foot and supports the foot without permitting appreciable flexing of the sole portion and which has diminishing rigidity towards the top edge thereof so that the opening at the top may be slightly expanded to receive the foot, the top edge of said cup member being extended upwardly beyond the undercut line along the side of the foot to envelop and support the curved portion of the foot along each side and said top edge being extended upwardly into the area behind the ankle to provide a stiff counter member for the heel and platforms built up below said cup at the heel and forward portions of the shoe to form, substantially flat areas adapted for attachment to the steel plates of a skate without modifying the contours of said cup member.

2. A shoe as specified in claim 1 in which the cup member is formed from a plurality of layers of resilient cellulosic plastic material molded to the shape of the foot and united into a single body with the top edges of each of said layers being positioned in staggered relation ship in the side wall of the shoe.

3. A shoe as specified in claim 2 in which the top edge of one of said layers is positioned above the undercut line at the side of the foot and in which the top edge of a second one of said layers is positioned below the undercut line along the side of the foot.

References Cited in the file of this patent

UNITED STATES PATENTS

2,147,455 Murray ---------- Feb. 14, 1939

Sept. 22, 1959 A. E. MURRAY 2,904,902

SKATING SHOE

Filed Oct. 25, 1957

FIG. 1

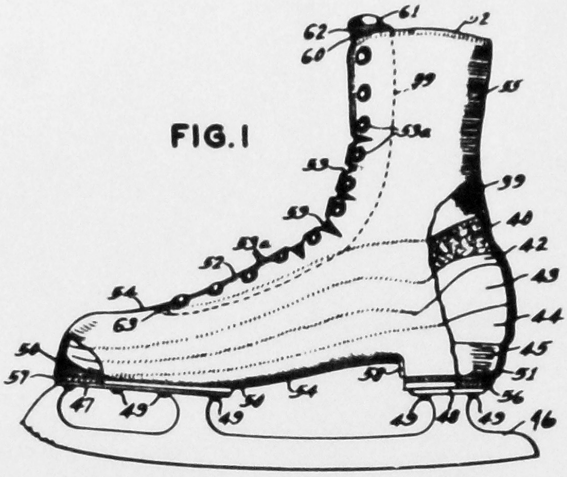


FIG. 2

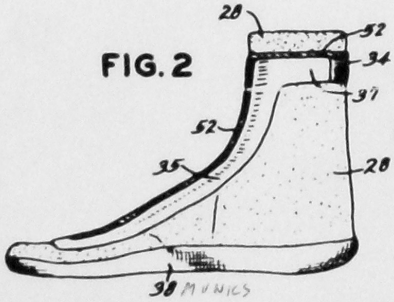


FIG. 3

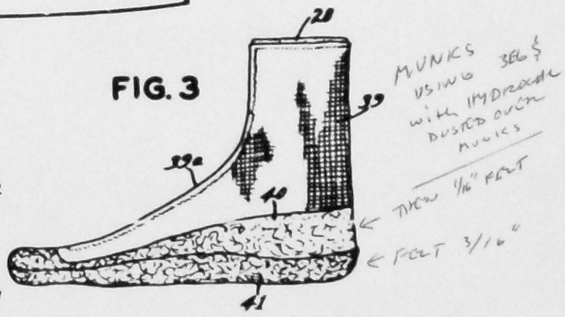


FIG. 4

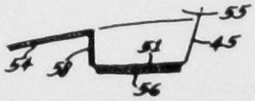
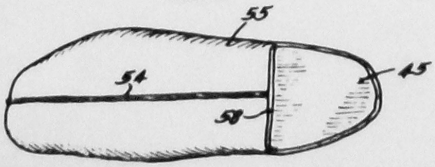


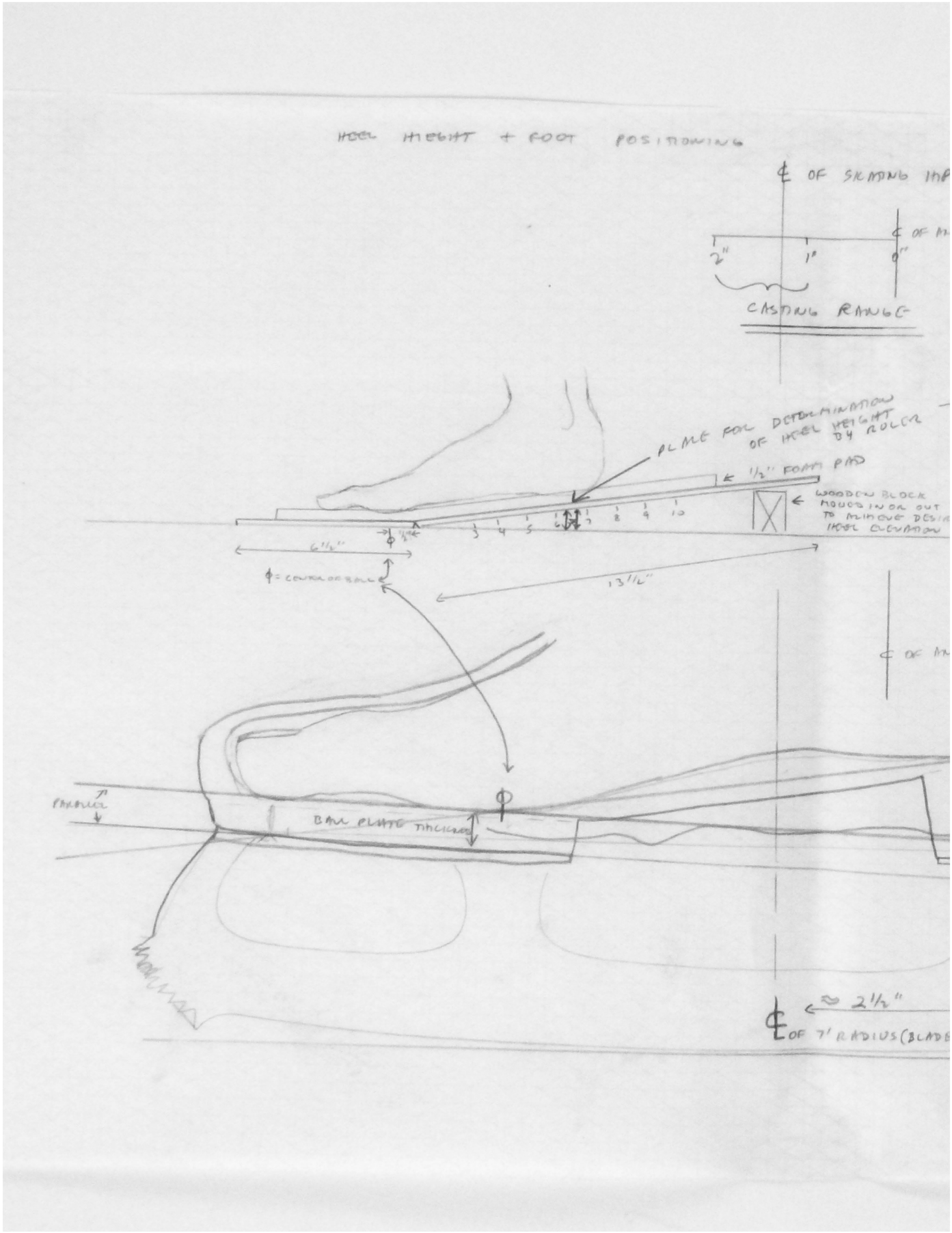
FIG. 5

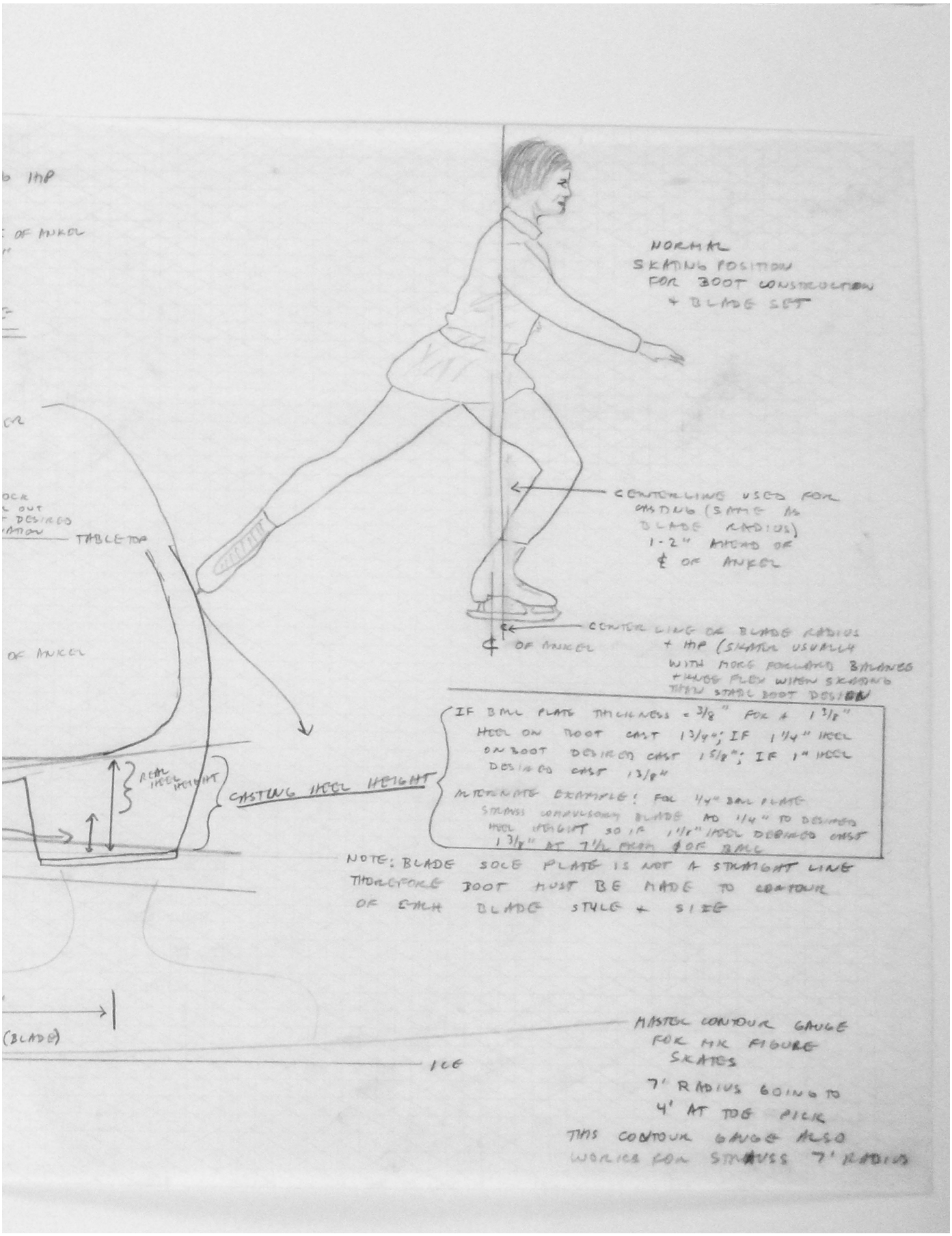


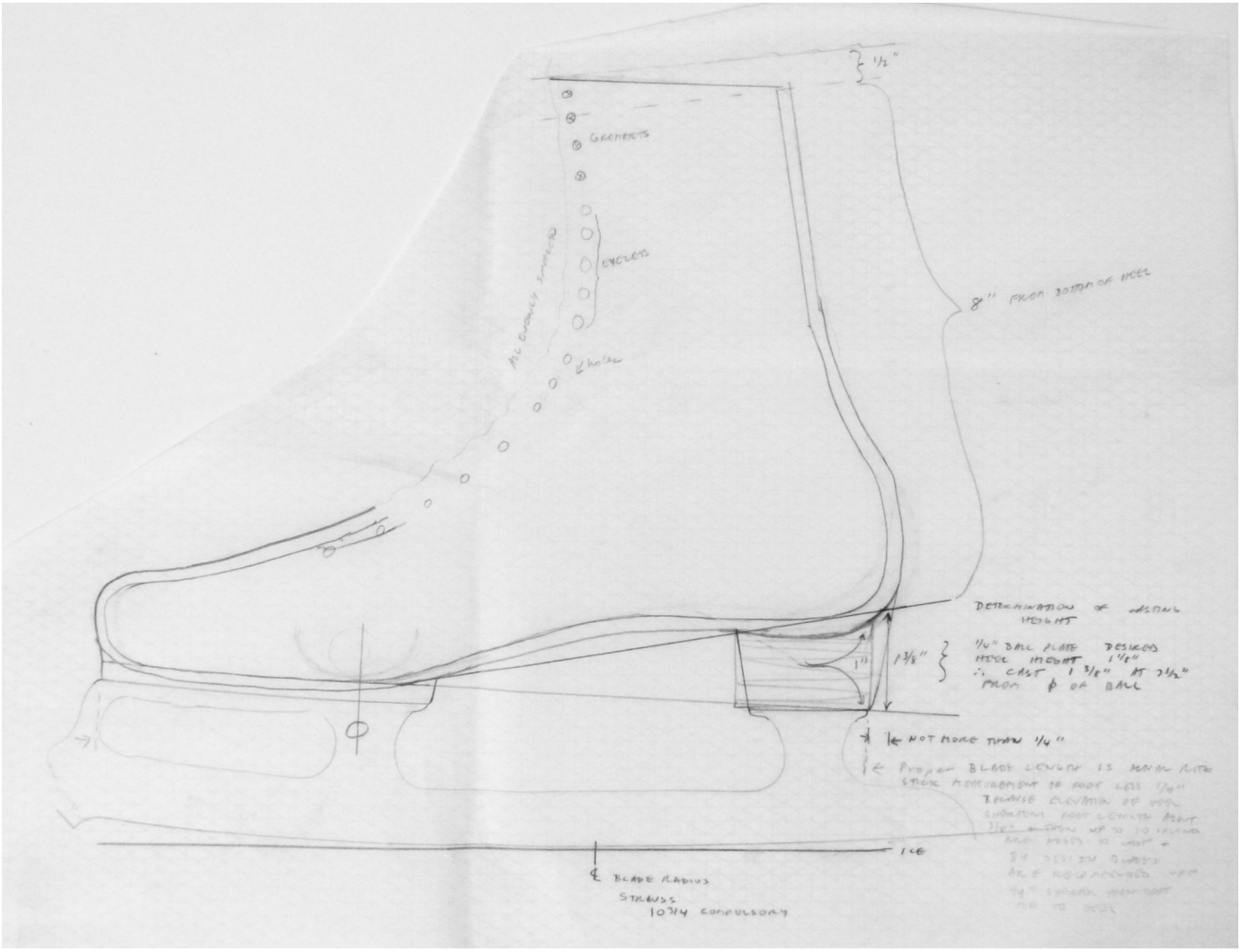
INVENTOR.
Alan E. Murray

BY

ATTORNEYS







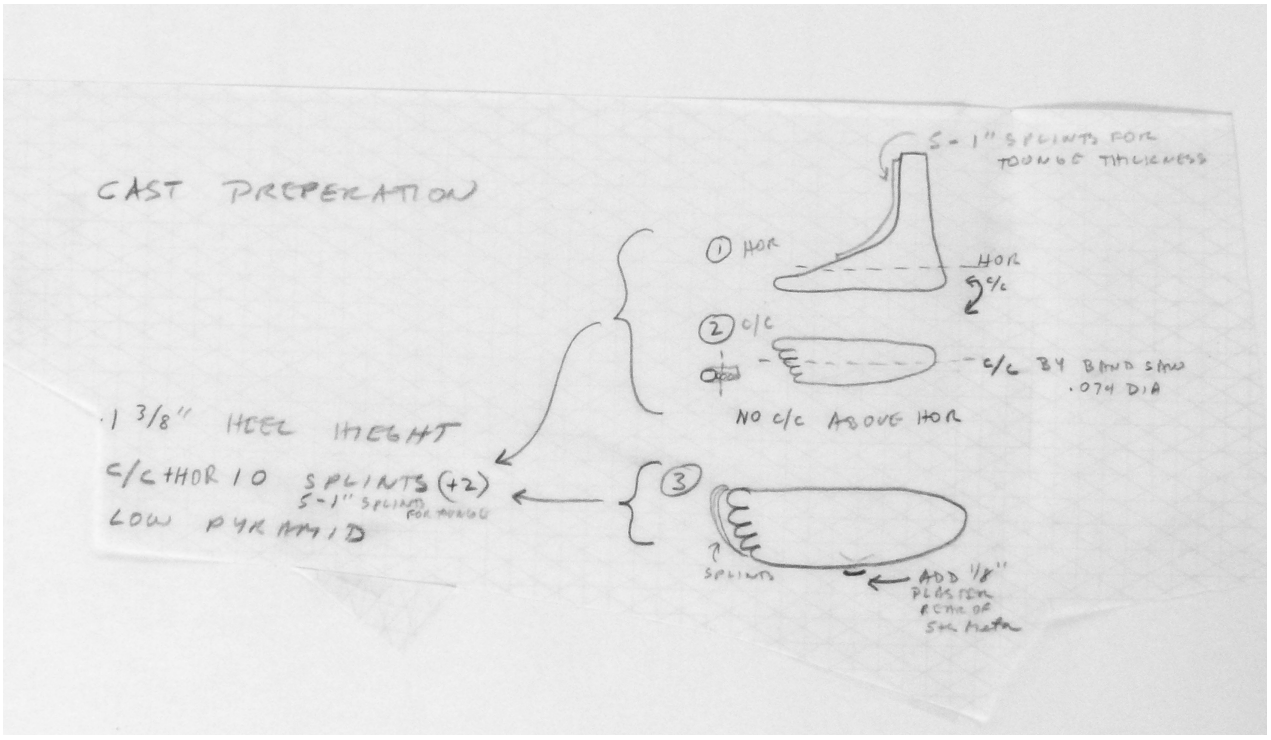
Pages 16,17,18 and 19 are the plans I made after reading Mr. Murray's ice skate patents. I tried to think out the processes and steps I would perform so I could make my ice skates as close to the patents as possible according to Mr. Murray's directions.

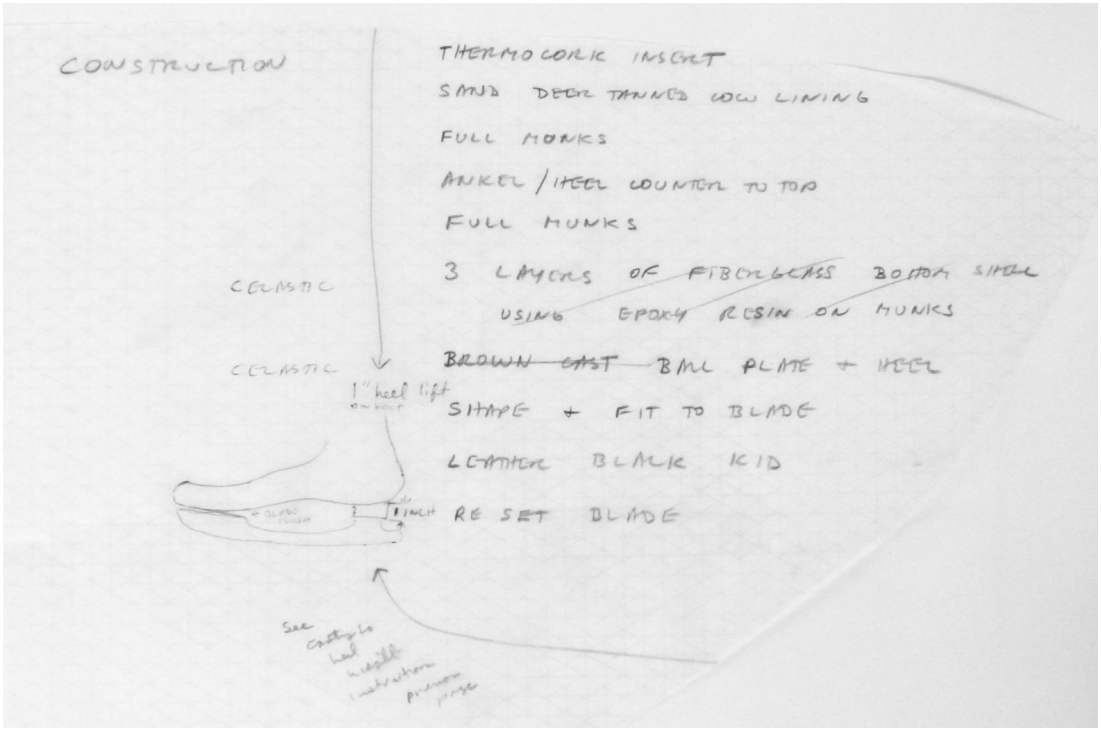
There is a lot of room for creativity in the making of ice skates. The key is to be able to understand and work with the biomechanical requirements of the individual skater. The balance of the completed footwear is everything.

I definitely, think the skater should be the maker of her or his own ice skates.

That is the only way to be able to adequately test, experience and fine tune the masterpiece.

Individually made and custom crafted molded ice skates.





THE SOCKS

The Murrays used cotton socks as a lining and inner material in the fabrication of shoes, boots and sandals. These were simple socks without ribbing or looped and thicker areas. The knit was even thoughout the length. They looked kind of like a tube. But, they had a toe seam and a heel side seam which was part of the knit pattern.

The cotton has advantages in that it is very compatible with the application of latex. Latex when dried, helps to preserve the form of the last and/or form of the foot.

The Murrays obtained their socks from two different hosiery mills. The products were very similar and probably used cotton from the same spinning mill. I remember the toe seams being slightly different, but that did not matter. It was the consistency of the yarn and knit that was important.

One supplier quit making the socks shortly after we began making the MURRAY SPACE SHOE®S on the west coast in 1979. About mid spring of 1983, I tried to place an order with the remaining supplier Shelton Hosiery Mills of Shelton, CT. I was informed that they had quit all business and were in the process of clearing and cleaning the premises. I don't even remember thinking. I just asked, "Do you still have the machines for making the shoe socks?"

I had learned from Lee Haley, my harness making friend, that you have to be able to do everything possible yourself if you want to stay in business.

Luckily, I got a very quick and good answer. "We still have the shoe sock knitting machines on the floor. You can buy by them if you want them".

My answer was immediately, "Yes".

I bought the sock knitting machines without ever having looked at them and without any knowledge of what I was buying. I didn't even know how they worked.

They were old, about 1926 or 1927 I suppose. They were in working condition. And, best of all, within a few days after delivery, I was able to make molded shoe, boot and sandal socks for all our MURRAY SPACE SHOE® footwear.

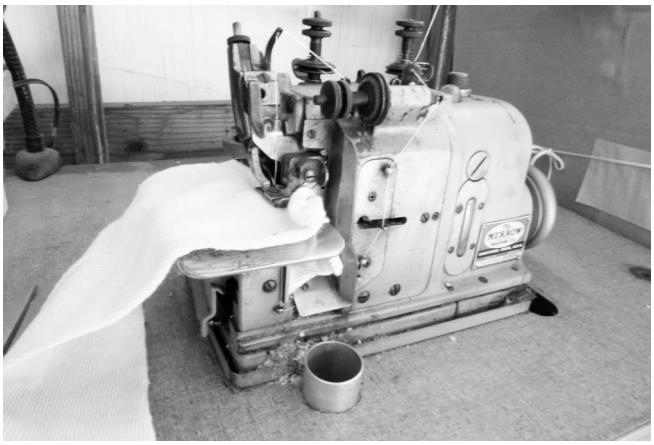
Now, I can vary the number of threads of yarn in the knitting process, increase or decrease the tightness or looseness of the knitting weave, and add a polyester thread for extra strength if desired.

These knitting machines were originally capable of knitting argyle socks. They have been stripped down to only the essential hardware necessary for the knitting of socks for molded shoes, boots and sandals. They are old. Ninety years is a long time for any machine. But, they work and are still an important essential to the making of my molded footwear.

Three pictures of the Banner Knitting Machine.

This machine is used to knit the socks used

in the making of molded footwear.



The Marrow sock seaming machine.

This machine is used to sew the toe closing seam.