fig 4.1

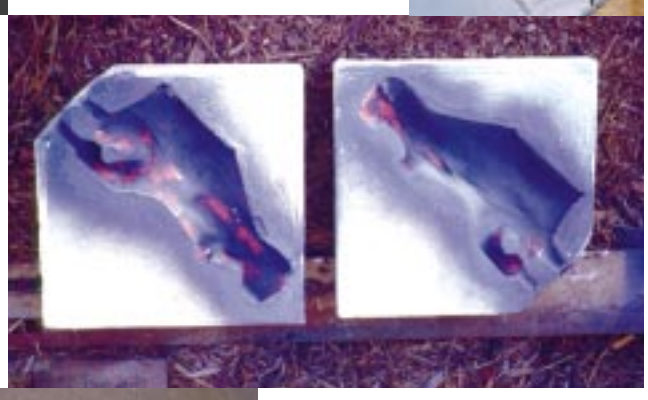


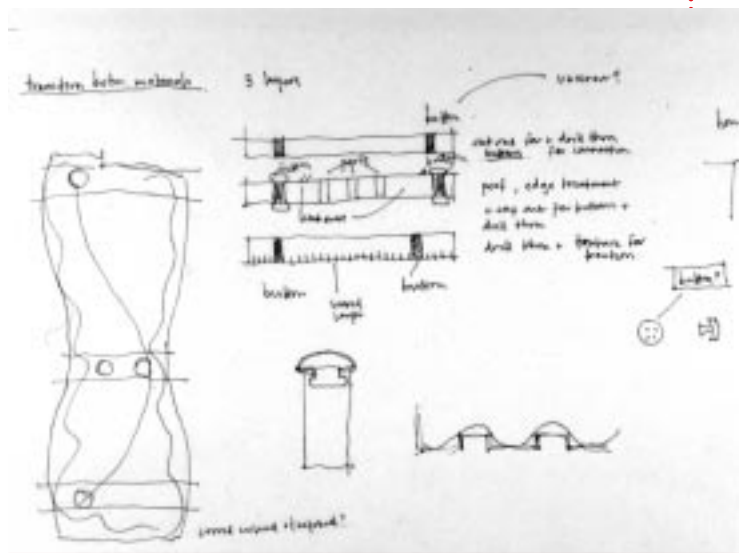
fig 4.2

fig 4.3

development of elastomeric urethane model

fig 4.4

fig 4.5 – concept sketch for layer and upper attachment



The initial concept for the attachment of the uppers was to notch into the sides of the sole and inset buttons to which the uppers could attach. After making a few prototypes and testing them, I realized that the uppers would eventually tear and the buttons wanted to pull out of the foam (fig 4.6,4.7). Not only did I need another solution but I needed to find materials for the uppers that would be strong enough to handle the stress placed on them when walking. Also, throughout the development I addressed and modified the shape of the sole template. Initially, the shape of the sole was quite sharp but I found that for reasons of comfort and visual elegance I needed to modify the sole to respond more to the outline and anatomy of the foot. Further, to provide more comfort, I perforated the middle layer (fig 4.8) to act as a cushion and notched the sides to make a distinction between the layers and create visual impact.

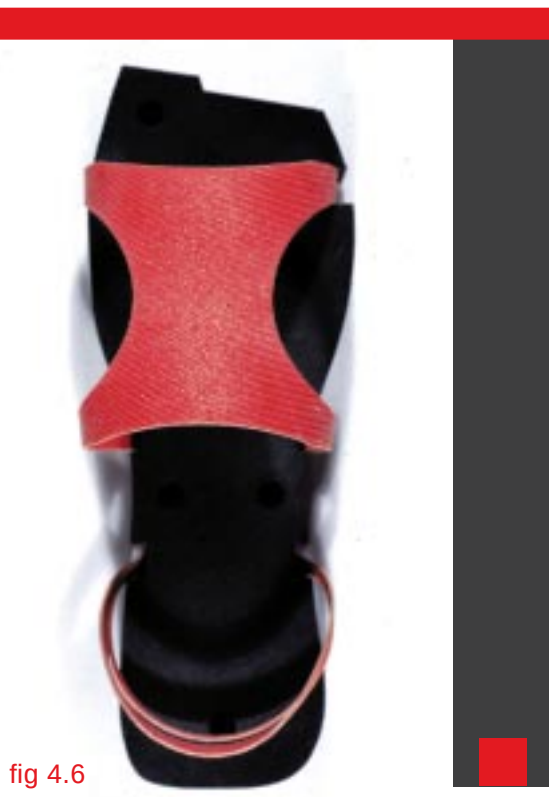


fig 4.6

fig 4.7 – second iteration of lasercut prototype with perforated and notched middle layer and twist pin upper attachment

My first heel prototype was based upon early form studies (fig 3.1). I used high density silicone (fig 2.4,2.5) because I wanted to test a material that would deform when it received the weight of the foot. Although the model itself was not completely successful it allowed me to discover problems with the form that I addressed in the next prototype. The second prototype was molded out of clay and directly applied to the cast of my foot to create a heel that responded to and mirrored the topography of the foot. Built into the heel was a hollow area which was meant to act as a spring upon impact of the foot. I then cast the model in a two part plaster mold and finally poured elastomeric urethane into the mold. Again, the resulting model was not a complete success but the process informed me about how I was treating the form. I realized that it might be helpful to model the form in a harder material which I could test by walking on it.

fig 4.8

fig 4.9 – final elastomeric urethane model

fig 5.0

fig 5.1

fig 5.2

Although the prototypes were maturing aesthetically I still had problems with the attachment of the uppers and the overall shape of the template. At this point I chose to eliminate all hard edges and made the form softer and more amorphic (fig 5.3,5.4). I experimented with perforating the top as well as the middle layer (fig 5.5,5.6) but found that perforating the top layer was uncomfortable as it created pressure spots on the sole of the foot. I continued with the idea of perforation as a method of attachment. I created elliptical holes on the sides of the template through which the upper could pass and then reattach to itself (fig 5.3,5.4,5.5) Initially, I had problems with sizing of the uppers but the first prototypes proved to be fairly strong and quite comfortable. In the next iteration of the upper I used one button and two button holes for adjustability.

fig 5.4 – third iteration of lasercut prototype with modified template shape and perforations for vinyl upper attachment

pic 3.6

In an attempt to more fully understand the mass / void qualities of the form I was creating, I applied my approach from path two to path one. By thinking of the form in layers instead of as a solid, I modeled the form in corrugated cardboard (fig 5.7). Interestingly, this study was more relevant to path two than path one but it was still a good exercise in visualizing the form in a new way. I then decided to make a final prototype out of Renshape (fig 5.8–6.2), a plastic material that acts like wood but without the grain. The goal for this prototype was to make it as functional and wearable as possible and to address the issue of the upper or how it would attach to the foot. Again, I wanted the upper to be secondary to the heel of the shoe and, if possible, be removable. After carving the heel, I inset foam pads (fig 6.3) and began to experiment with different weights and widths of elastic. The idea was that the elastic would pass under the shoe into recessed areas and then wrap back onto the foot and around the ankle (fig 6.5).

fig 5.5

fig 5.6

fig 5.7

fig 5.8

fig 5.9

fig 6.0

development of renshape model

fig 6.1

fig 6.2

fig 6.3

fig 6.4 – profile of final lasercut prototype

For the final prototype of the template shoe I made a number of modifications. Again, I tried to make the shape of the template more elegant and footlike (fig 6.6,6.7). Also, I applied what I had learned from the corrugated cardboard model in path one and increased the number of layers in the shoe to four (fig 6.7–7.0). Not only did this make sense as I needed to put a tread on the bottom of the shoe but it created some excitement in the profile (fig 6.4). I applied the tread in two pieces which also helped break the static feeling of the shoe profile (fig 7.3). Finally, I experimented with a number of upper materials including vinyls, nylons, rubber cording, stretch fabrics, velvet cording, terrycloth, plastic screening and elastic (fig 7.1). I found that many of these materials worked quite well because of their strength and in some cases elasticity.

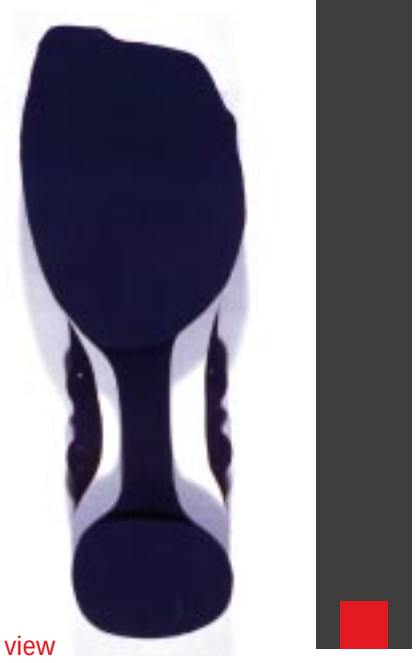


fig 6.6 – bottom view

fig 6.7 – top layer

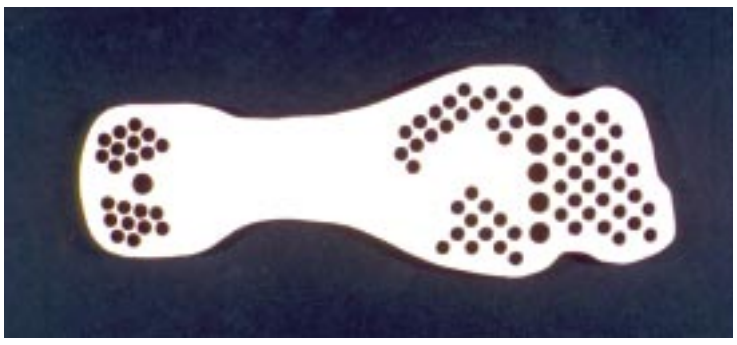


fig 6.8 – middle layer

fig 6.9 – bottom layer

fig 7.0 – tread

fig 6.5 – final prototype for path one

fig 7.1 – various path two prototypes and uppers

fig 7.2 – path two prototypes with vinyl uppers

fig 7.3 – final prototype for path two

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At the beginning of both paths it was important to me to end with two well developed and wearable prototypes. I set this goal in order to force myself to address issues that are relevant to the real world and so that I would not drift off into a fantasy world. Although path one was more experimental I did begin to think of it's feasibility as a product but I did not address questions of cost and manufacturing as I did in path two. Throughout the project It became clear that there are an enormous number of issues to address when dealing with an object that interacts directly with the body. Because of the constraints of the project I had to narrow my focus and chose which issues I wanted to deal with. I chose to address transportability and transformability because I felt that those issues would help me to think beyond what I knew about shoes. Also, transportability and transformability are concepts which are relevant and alive in our time and presented me with the opportunity to further develop one of the paths. Continuing the design process of path two to include packaging and graphics was a natural next step in the maturation of the prototype into a product.

product: packaging and graphics

Because I addressed issues of manufacturing and cost in path two, I felt taking the final prototype to a higher level of development would help me to better define it as a product. I began to develop ideas for packaging with an integrated graphic / logo using the same materials as the shoe. I went through a number of prototypes using plastic screen, rubber cord and foam (fig 7.4,7.5). The most successful prototype was an envelope held together by a rubber cord which also acted as a carrying strap (fig7.6,7.7). I wanted the packaging to be transparent so that you could see the graphic on one side and the profile of the shoes on the other (fig 8.1). The graphic / logo, which was to be screened onto the foam insert of the envelope, was based on the idea of a footprint (fig 7.8–8.0). I also developed a smaller envelope to be used for additional uppers (fig 8.2,8.3).

fig 7.4

fig 7.5

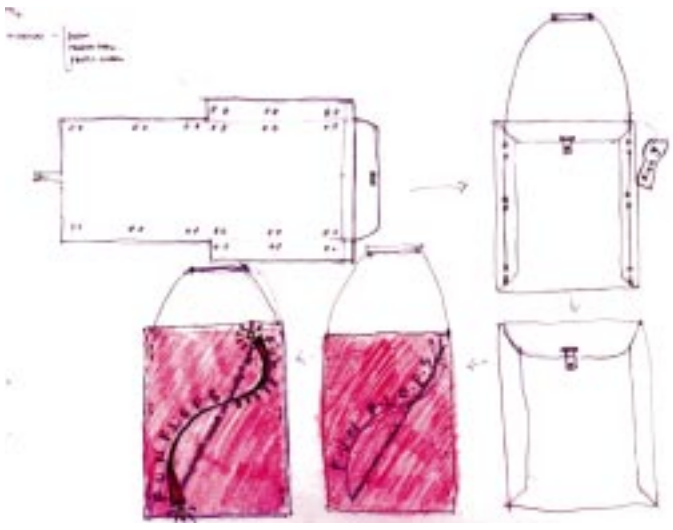

fig 7.6 – concept sketches for envelope

fig 7.7 – first envelope prototype

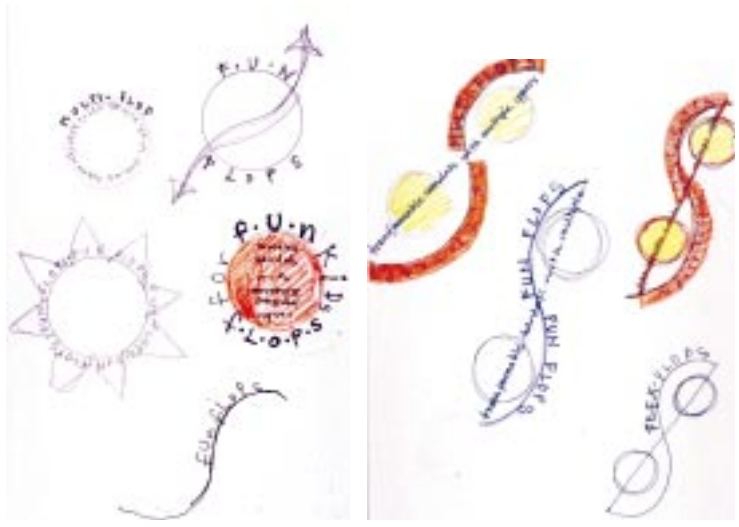

fig 7.8 – concept sketches for graphic / logo

fig 8.0 – final iteration of graphic / logo