

INTARSIA

Lucille Crabtree



Text written with and photography by Leslie Bock

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a

A Schiffer Book for Woodworkers

DEDICATION

To my loving sister and dear friends Mary Ball and Del
and Jolease Reavis, for always being there with
encouragement.

Thanks.

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with book ideas on related subjects.

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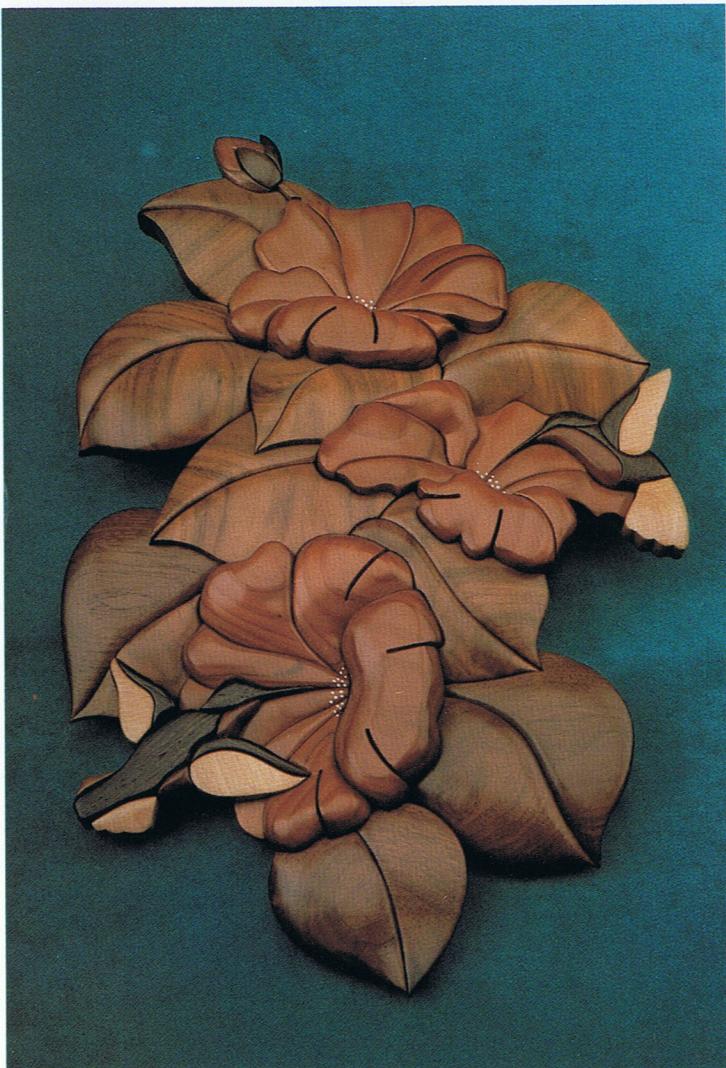
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Introduction

Dear Friend,

When my mother was about ten years old, my grandfather started to build his greenhouses using a hammer, nails, and a saw. This started her love of wood; years later, she passed the intrigue she felt on to me and to the rest of her children.

I began woodworking when I was very young. We lived two blocks away from a church manufacturing plant, and after school I would dig through their scrap pile and drag home everything my heart desired, designing great projects in my mind every step of the way. Mom and Dad saw my interest, and soon bought me a saber saw from Sears. My woodworking career had begun.

Later on, the school I attended had woodshop. These classes were the best thing that happened to me at that time; it was like coming out of the Dark Ages. No longer was I limited to just a hammer, nails, and the saber saw — I got to try the tools the big boys used. I was now able to make bookends, small boxes that (at last!) held together, wooden wall plaques, and carved serving trays.

At home in the basement, my brothers and sisters and I worked with Mom to make bookcases, refinish our chests of drawers, and build shelves. By this time we had accumulated more tools, and were better able to punch out small projects at a pretty good rate. I really enjoyed working with Mom because she was always willing to try new things. She encouraged me to express my creativity and my love for woodworking.

At the age of 19, I formed a partnership with Mom and Dad, and together we opened a cabinet shop. Now I really did get to use the tools the big boys did! After a few years the economy had bottomed, and a large pre-fab cabinet shop went into business in our town, so our shop had to close its doors (along with two other independent cabinet shops). Our shop died, but our love of woodworking did not die with it.

A few years later I was visiting a friend when I read an article about the intarsia work of Judy Gale Roberts. I had never seen anything like it. For me, it was new and creative. I couldn't get it out of my mind.

When I went home I set up shop in Mom and Dad's one-car garage, and sent for some of Judy's patterns. I practiced

until I had it down pat. Of course I had to do it in different ways than anyone else, so I started experimenting, I tried adding more three-dimensional depths, and cutting out the tracing from different woods. The first few pieces I made were of red western cedar. I advanced to using oak, ash, and walnut. To me, it still looked plain, lacking in color. I didn't want to stain, paint, or dye the wood, so I began checking out options on the wood market. I found over forty exotic hardwoods from around the world — reds, browns, oranges, purples, blacks, yellows, greens, and pinks, and some that were striped, spotted, and laced. Now *this* was becoming exciting!

Mom and Dad soon moved across town to a house without a garage. However, to the side of the house was an avocado orchard. I built a 16' x 24' deck in between the trees, set up a 10' x 14' metal shed in one corner of it, and hung a large blue tarp from the tree limbs for shade — my own shop!

This is when Mom started drawing patterns for intarsia. She began researching and making designs and patterns for me. To help her understand what I needed in a pattern, I began teaching her everything I knew about intarsia. Mom became the best-skilled pattern-maker I know of. She is able to catch the mood, the essence of the subject — the intense watchfulness of the wolf, the alertness of the antelope, the relaxed laziness of the lion.

We worked together on these projects until we had patterns that were superior to anything we had seen elsewhere.

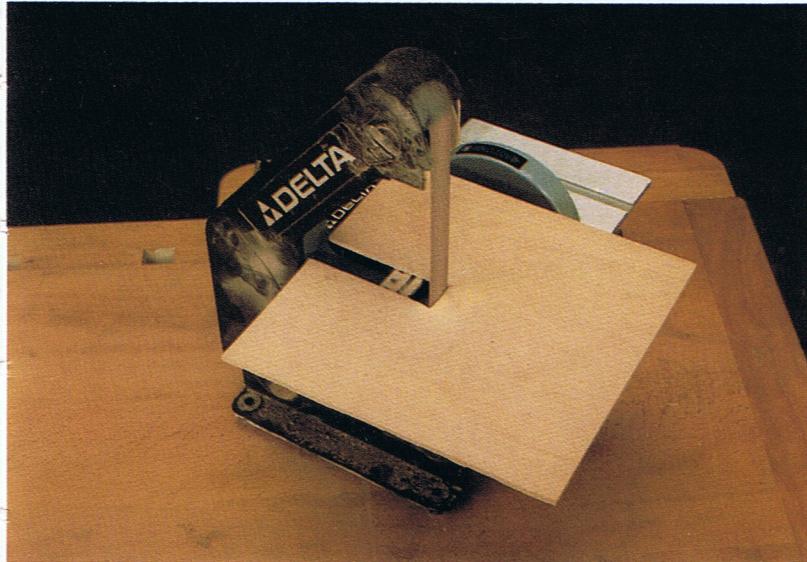
My sister Brenda is now an intarsia artist also. She and my mother both draw patterns and are experts in all phases of the intarsia process. Brenda has shared her "Sweet Nectar" pattern with you at the back of this book.

If you are looking for something to do that will excite your creativity, put you in touch with nature, build your self-confidence in your woodworking talents, and make great gifts for your friends and loved ones, intarsia is it. My wish is for you to read this book not only with your mind but also with your heart, so that your projects will be expressions of the creative potential of yourself and your wood.

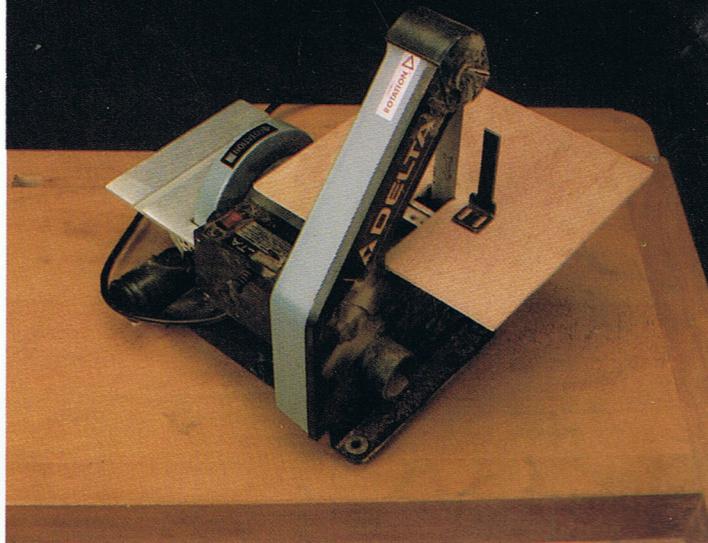
Best wishes,

David Crabtree
Master Intarsist

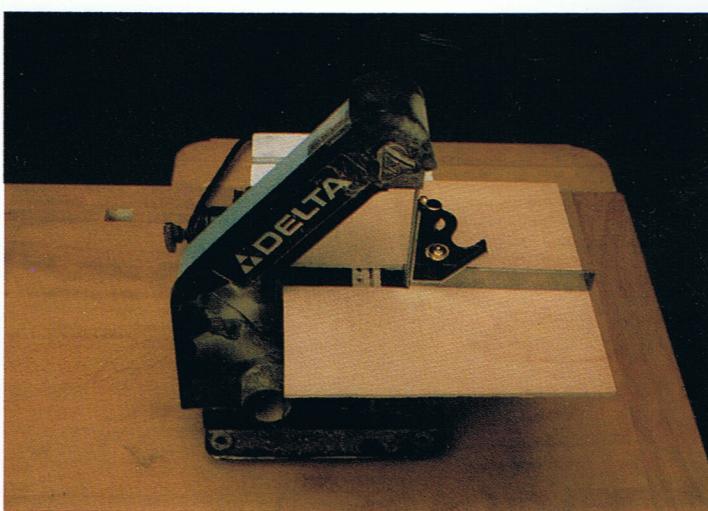
The Equipment



The equipment I will use for this project includes a 1" belt sander, here set up with 180-220 grit sandpaper. For finer sanding, I will switch to 320 grit paper.

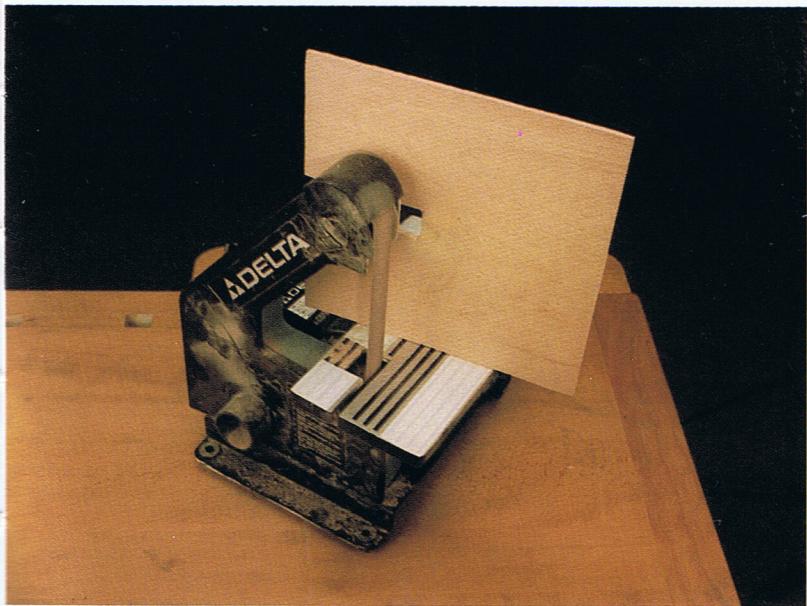


Here you can see the platen, the piece which is behind the belt to support it. I have found that I have more flexibility for sanding curves if I file down the sides of the platen, as I have done with this one; the platen was originally the same width as the sandpaper belt, but I reduce both sides to make the platen 5/8" wide. The flexibility gained by filing down the platen is crucial in the fitting/sizing stage, since all your curves must fit together precisely.

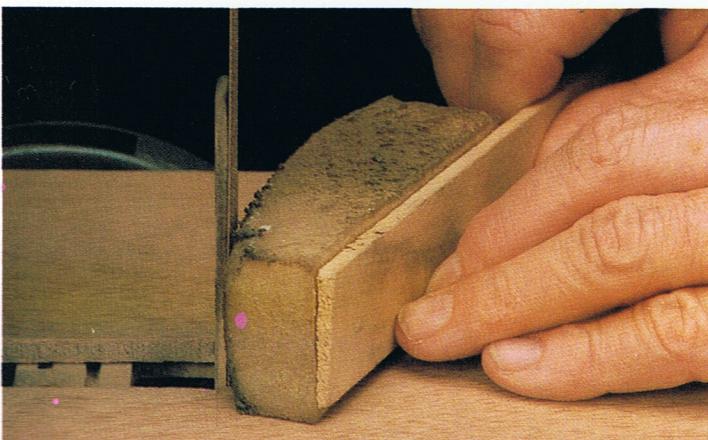


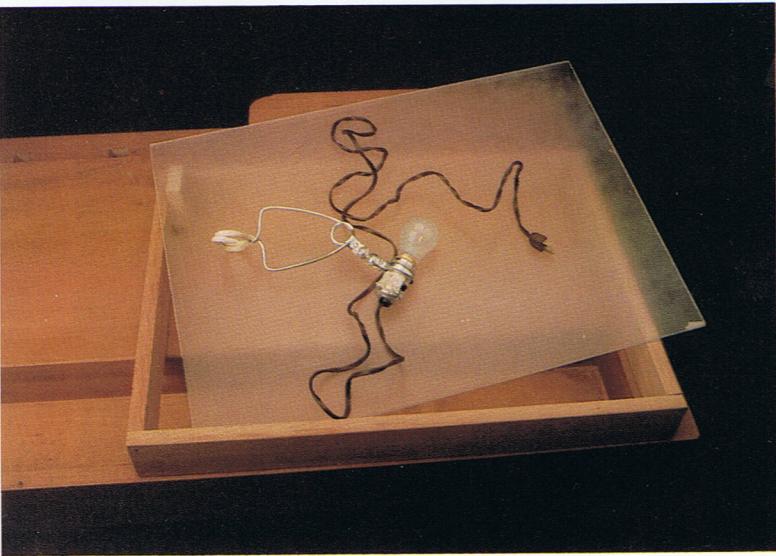
Remember to make sure that your belt, platen, and table are square. If they are not, your pieces will not fit together. The tops may fit, but the bottoms will be too loose or tight, or vice versa.

I use a belt eraser to keep the belt clean. I also use it for the vibrating sander.



I have fitted this machine with a home-made wooden table, which I have found to be easier to use for intarzia. You can see that the original metal table has a significant gap between the table edge and the sandpaper belt, making it difficult to sand small pieces with any precision. I will fit the wooden table flush to the belt, so that I can work very closely. Spraying with Teflon makes this surface easy to slide pieces around on.





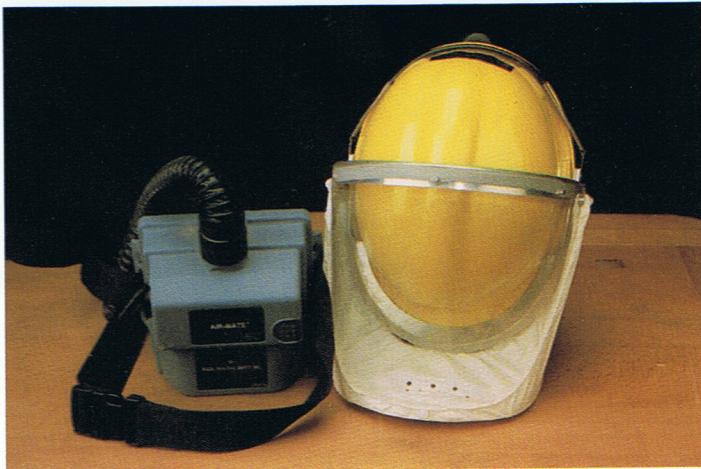
A light table of some sort is critical for the fitting and sizing stage. One can easily be assembled with a simple wooden frame, a 20-40 watt light bulb fixture, and a sheet of plastic. I have sanded the surface of a 1/4" sheet of plastic with 400 grit sandpaper, and placed it frosted side down; this serves just as well as frosted glass.



I use a vibrating sander like this one, with 220 grit paper, to achieve a satiny finish on each piece.



I also use a band saw with a 1/8" blade instead of a 1/16" blade. You will see that I have fitted this one with a wooden table much like the one I made for the belt sander. If you prefer, you can use a scrollsaw for this project instead. A jigsaw would come in handy, but it is not necessary.

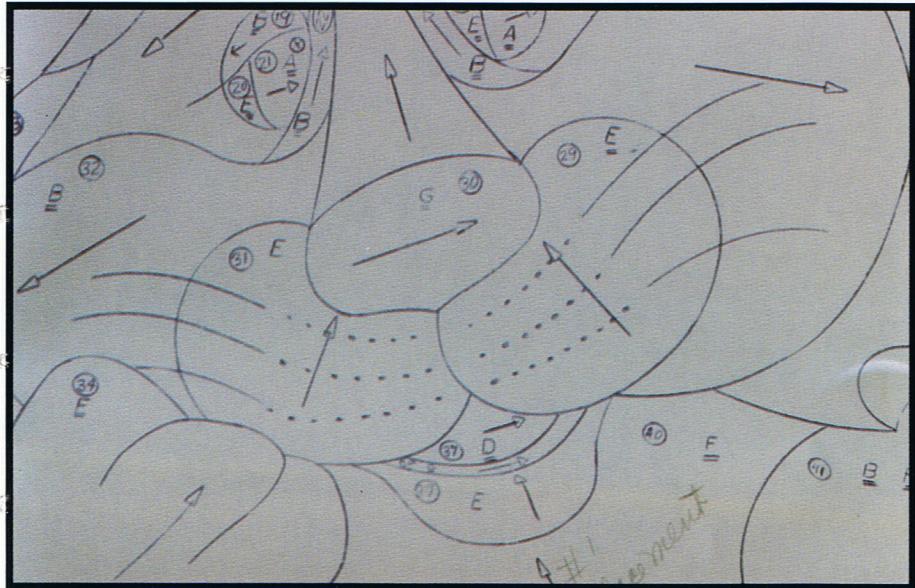
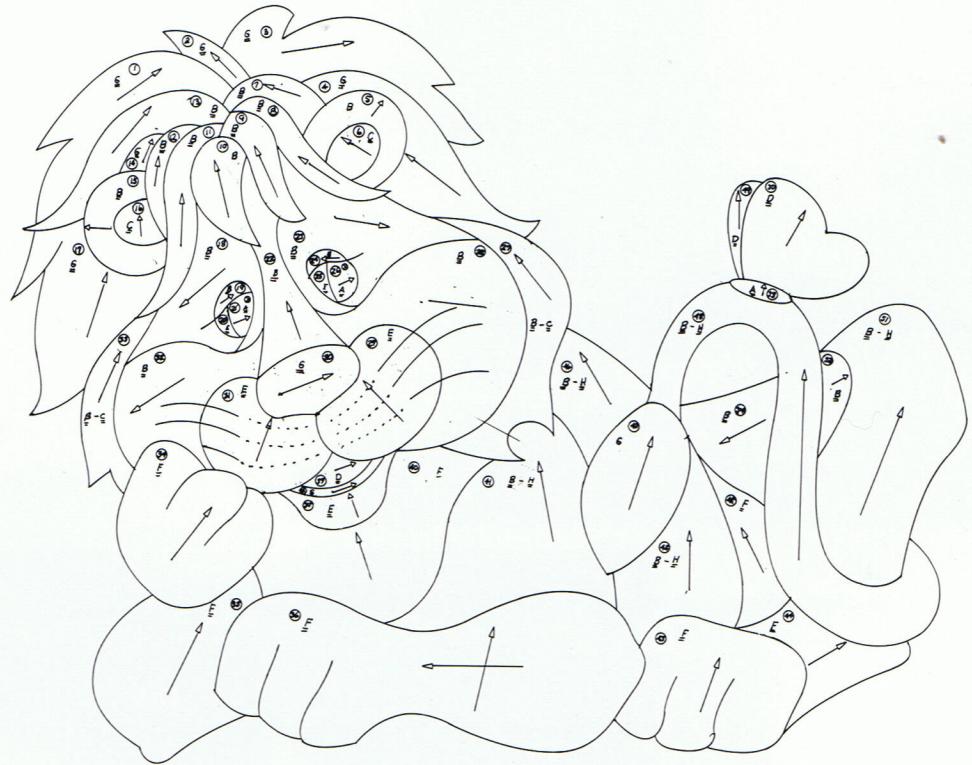


You will need to wear safety gear to protect your eyes and lungs from wood dust. You can use a combination of a mask and safety glasses, or a vacuum system with a face shield.



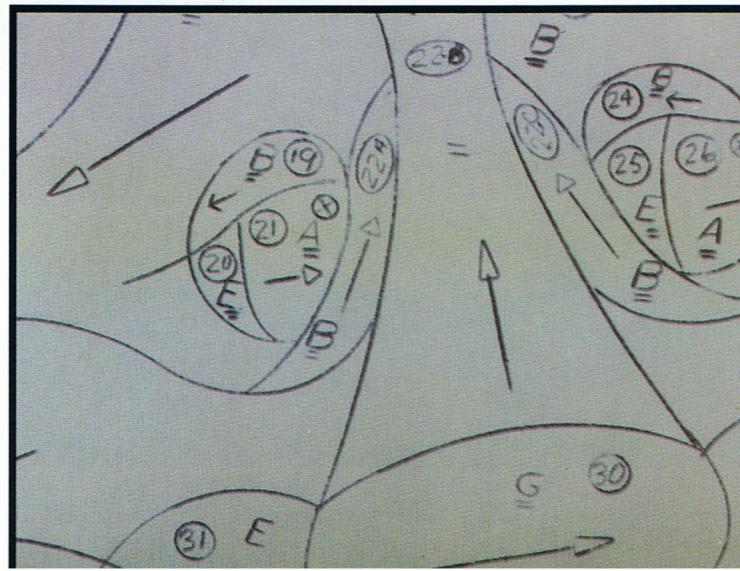
You should wear a facemask whenever there will be sawdust flying through the air; some woods, including walnut, are particularly toxic. Be sure to shop carefully; some masks carry labels saying clearly that they will NOT protect your lungs. The items pictured here come from Enviro-Safety Products in Woodlake, CA.

Using the Pattern



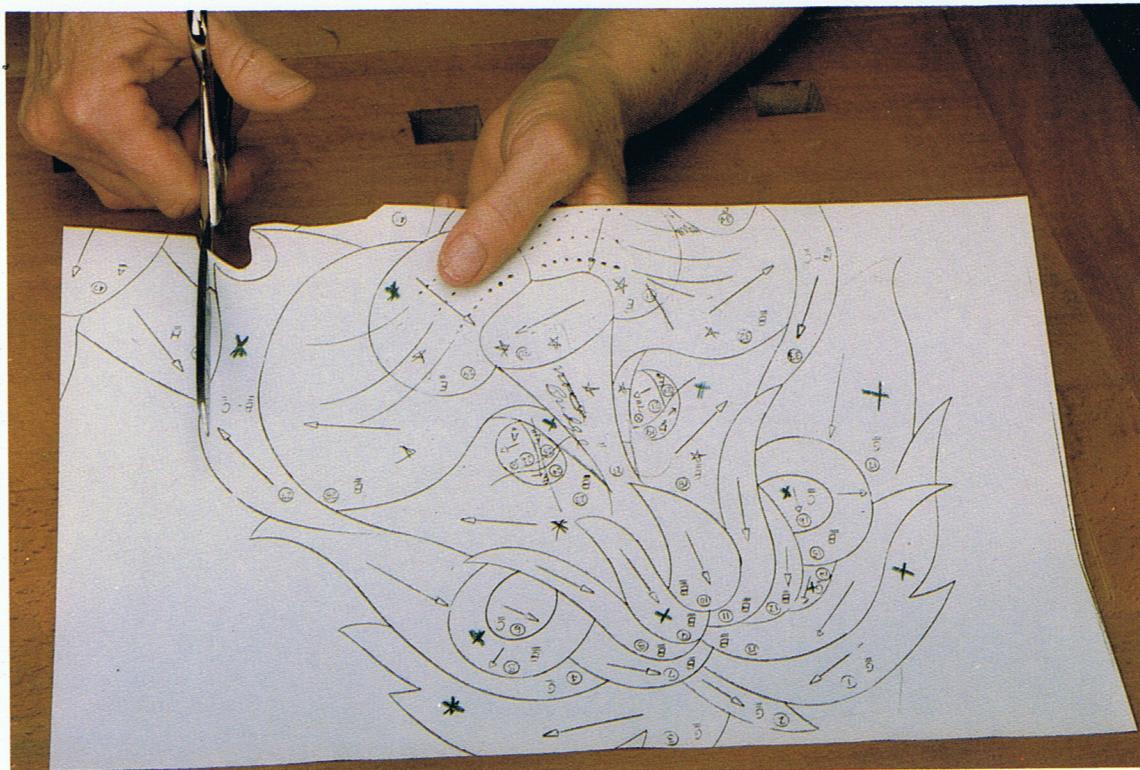
Here is a close-up of the pattern. Note that each piece is marked with a number, a letter, and an arrow. The number is to help you keep track of the pieces; it makes the 'puzzle' easier to fit back together each time you need to cut, fit, size, measure, or arrange your pieces.

The letter is a code for what type of wood is to be used for the piece. It will help you remember which pieces need to match in color. Feel free to use whatever woods you want to make your figure. Some craftsmen make multicolored pieces using different cuts and varieties of cedar alone! The arrow indicates which direction the grain should run along the piece. Keep this in mind as you lay the pieces out on their appropriate planks.

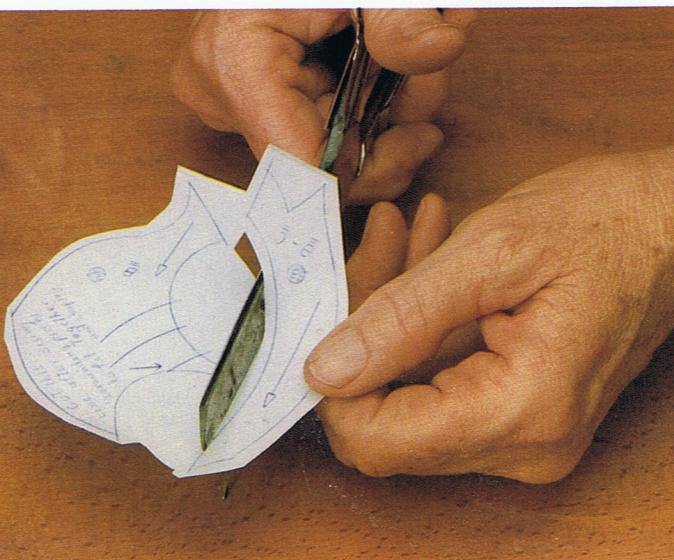




To cut out all the pattern pieces, you will need to Xerox the pattern in this book several times, probably between 4 and 6. (Make sure you always Xerox in the same direction, since copy-machines tend to stretch images slightly one way or another.) After you have reserved a full copy to use for reference, you can use the rest for cutting. Since you must leave a bit of border around each paper piece, you will not be able to cut adjacent pattern pieces out of just one Xerox copy. Here is an example of which pieces I might cut out of one Xerox sheet.

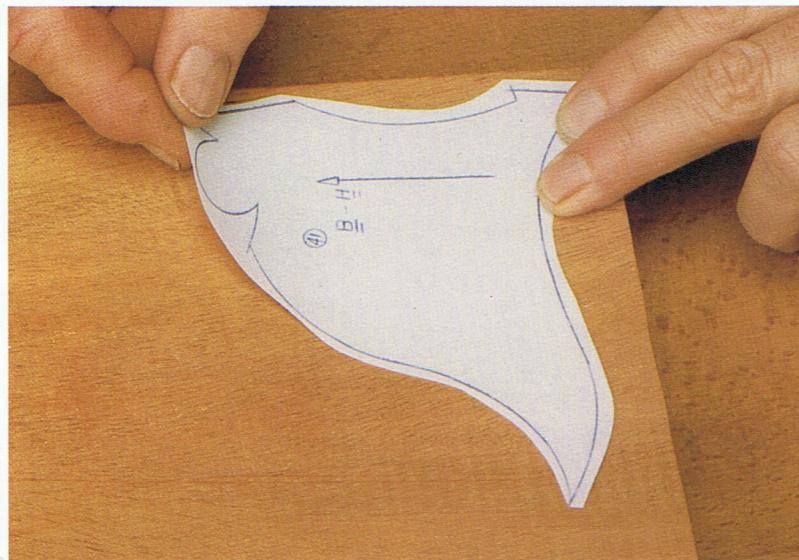


Cutting into the lion pattern to get a pattern for one piece of the mane.

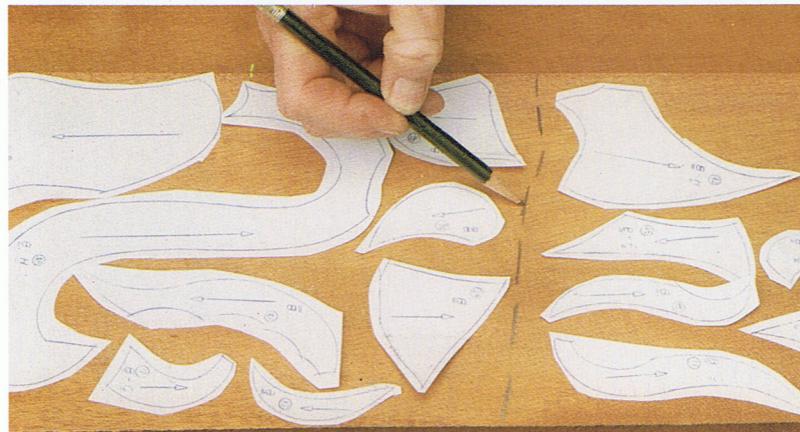


As you cut out each piece, be sure to leave a border edge. This will give you some leeway when you are cutting the wood itself. I usually leave at least a 1/8" outside border.

Laying Out the Pattern Pieces



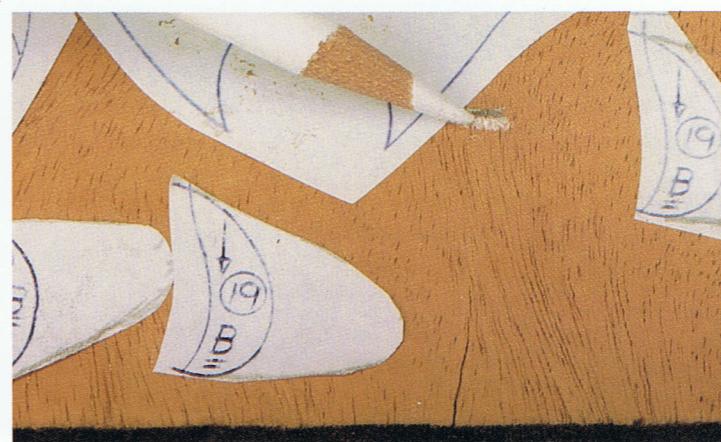
Pay attention to the wood's grain when you place your pieces. Part of the artistry of intarsia is the use of the grain to enhance the look of the piece, and to give it texture. Imagine that you are painting with the wood, and decide which direction the 'brushstrokes' should go. Particularly when you are dealing with furry creatures, give thought to how the fur would lay, and arrange the wood grain accordingly. This will give an elegant, professional look to your work. Do not glue the pattern pieces onto the board until you have laid them all out — you may need to rearrange.



As you lay the rest of the pieces, keep in mind that you will need to cut your board into segments before doing any detailed work on the band saw. Lay your pieces in segments, so that you can easily divide the board into manageable portions.



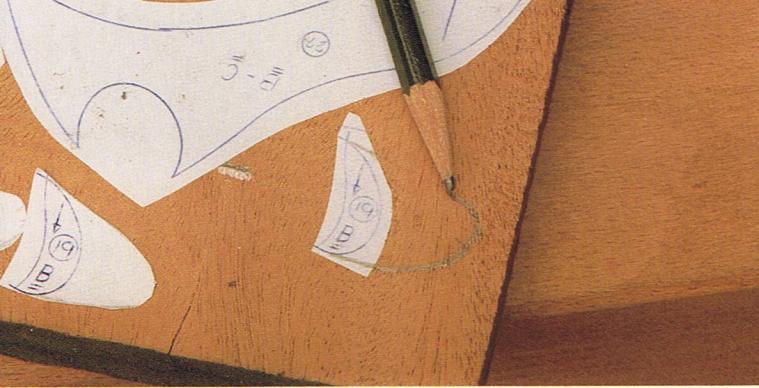
Check for imperfections in the board while you start to lay the pattern. Look for ripples in the surface of the wood, which may have been left in when the board was planed. It is easiest to sand them out now, before laying your pattern. Also, pay attention to any splits that occur in the board ends. Remember to wipe or vacuum the board before you lay down the pattern.



Do not lay any pieces closer than an inch away from the end of the split, since there may be invisible hairline fractures that can open up later when you are working with the wood or even after the piece is finished. Be aware that the split may not go straight through the board; check the other side too, in case it runs at an angle.



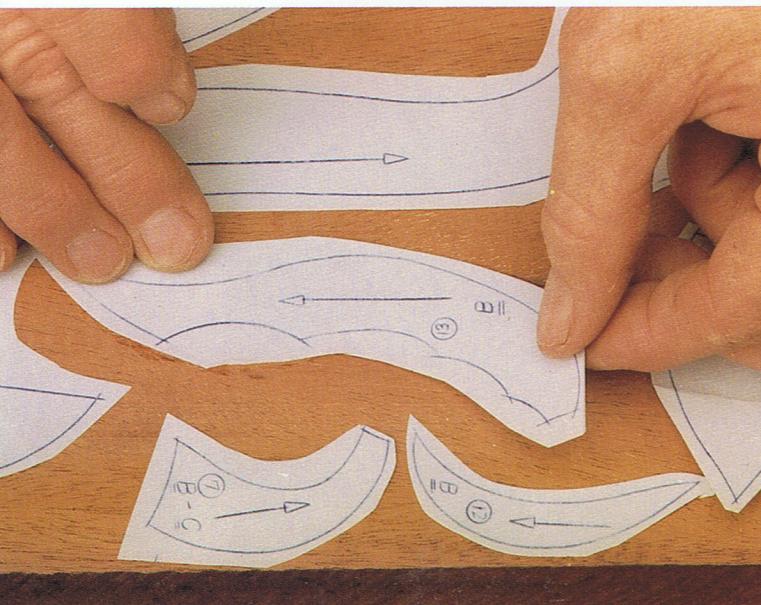
Likewise, knots must be avoided. Mark around them on the front (the center white mark here), and then the back (I have indicated where the back of the knot lies with the dashed line here). The very smallest of knots can be used safely, but pay attention to where you place it. A knot can be very obvious in a finished piece once the varnish is on, so place it where it will enhance the whole picture. You are painting with wood — would you *paint* a dot there?



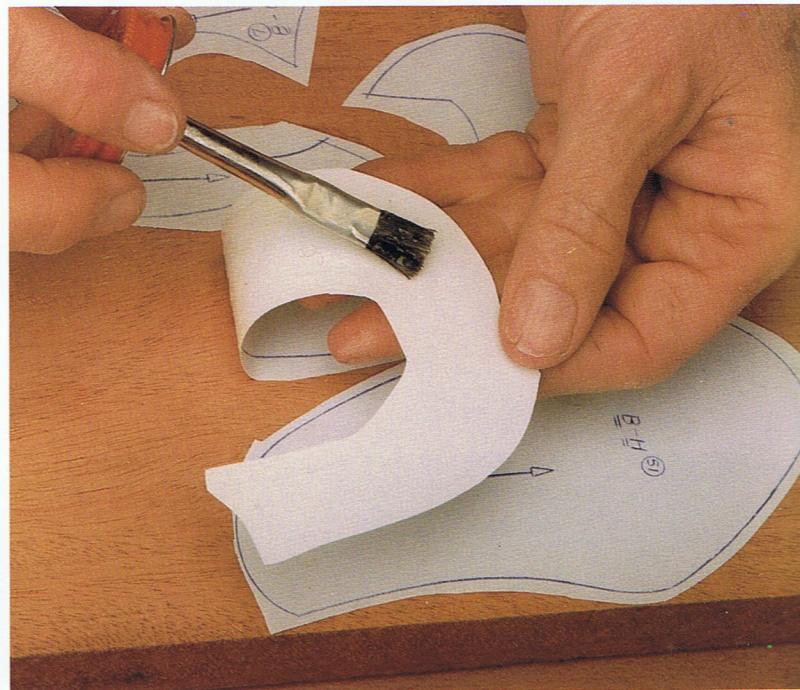
When you are laying out very small pieces, like the crescent-shaped eyelid shown here, leave room for a 'handle'. Having this handle will make it much easier for you to cut out and sand the tricky inside curve of the eyelid later. The handle will be cut off when it is no longer needed.



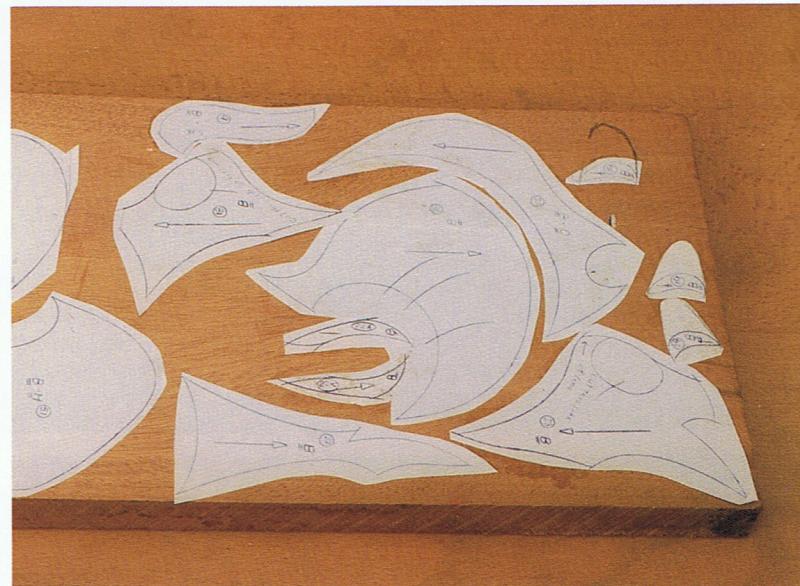
I use rubber cement to attach pattern pieces to the board. That allows me to peel up and reposition them if I need to make a change, and does not damage the wood.



Here, I am laying the reddish-brown lion pieces onto a mahogany board; you may choose to use a different type of wood for this set of pieces. Once I am happy with the arrangement of all the pieces for this first board, I can glue them down.

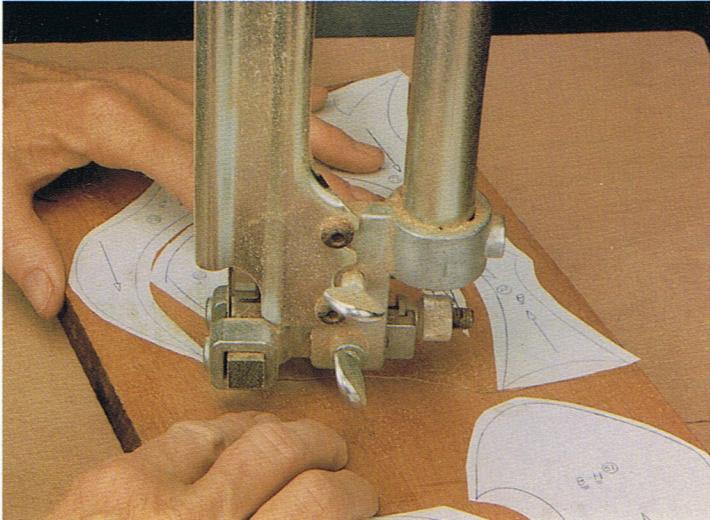


It is sometimes easier to glue the big pieces gradually, applying the rubber cement as you smooth the paper down.

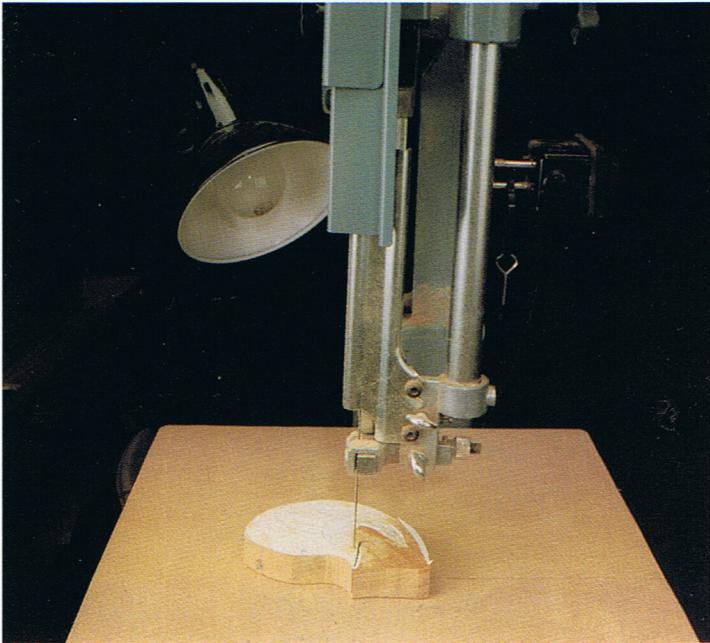


When all the pieces on the first board are glued securely, it is time to cut them out.

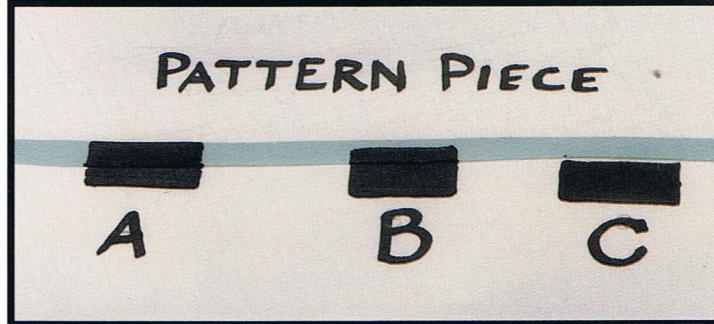
Cutting Out the Pieces



First, cut the board into manageable segments; this should be easy, if you remembered to lay the pieces in relatively small groupings.



It is almost impossible to see the lines clearly enough to cut precisely without focusing a strong light on the area. Before I start cutting individual pieces, I always set up an extra lamp. It makes for more accurate and closer cutting.

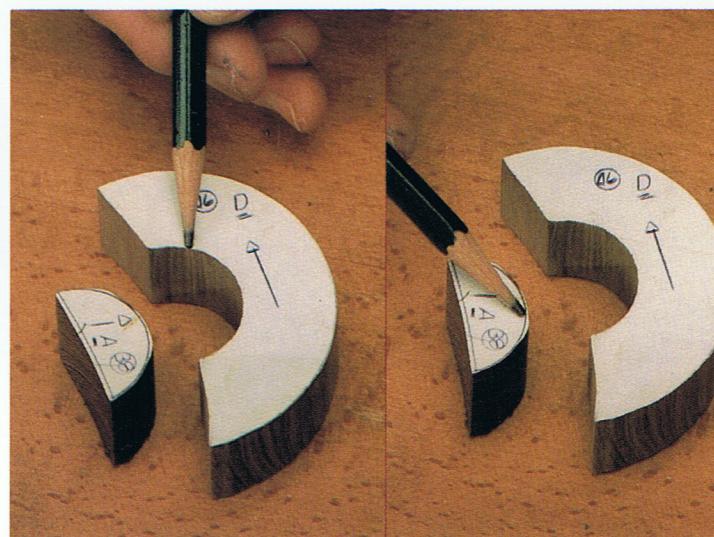


When using a band saw or a scroll saw, there are three ways to cut: a) on-line, b) mid-line, and c) outside-line. When you cut on-line, you must be careful to cut away all traces of the line drawn on the paper, without entering any farther into the wood, since this will leave you with a gap on your piece. Mid-line cutting leaves a trace of the line behind, which will allow you some room for sanding. Outside-line cutting leaves the entire line; you will use sanding to gradually take out the remainder of the line when you fine-tune, and to smooth out any ridges left by your blade.

On-line cutting (sometimes referred to as inside-line) is used in concave areas, inside corners, and other areas where it is difficult to fine-tune the shape with the sander—places where you will want to be as precise as possible on the first pass, with the band saw.

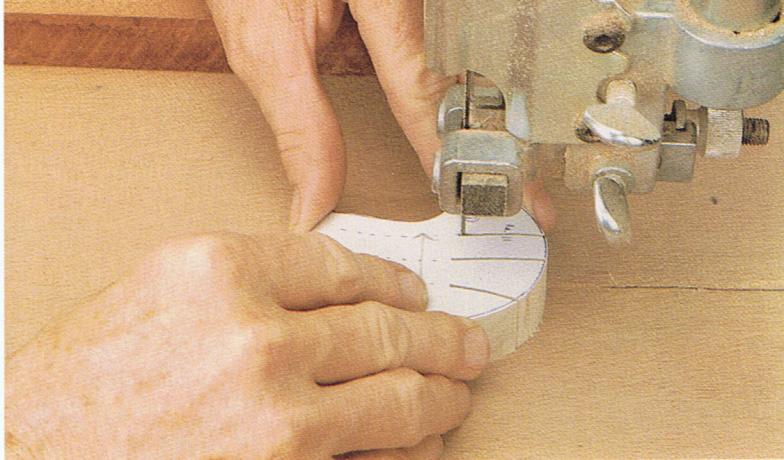
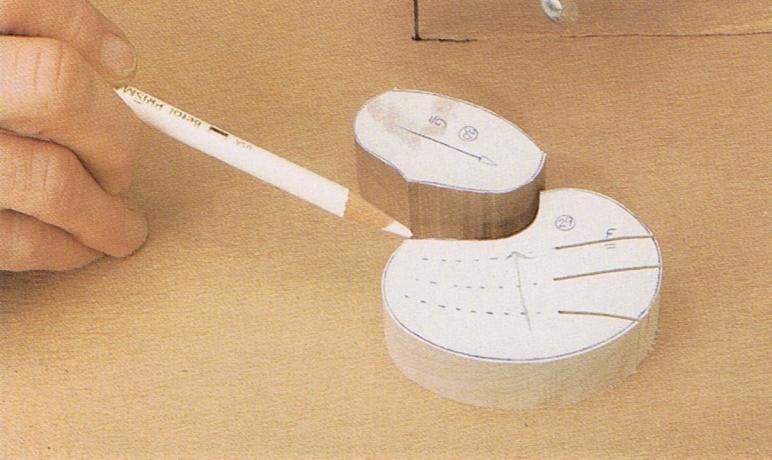
Mid-line cutting is used in areas that are not quite so difficult to fine-tune with your sander, so you can leave some leeway for fitting the adjacent pieces.

Outside-line cutting, which gives you even more leeway for fine-tuning with your sander, should be used on any piece that will be easy to sand. The extra wood you leave around the edges of the piece lets you work more with the sander, which can be a more precise tool if you use it in light strokes.

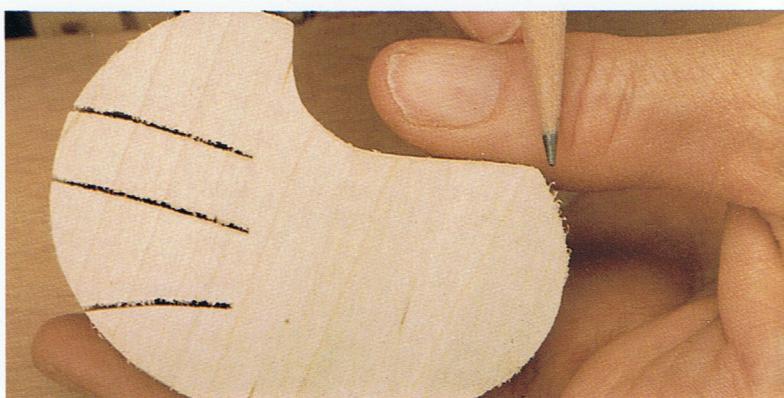
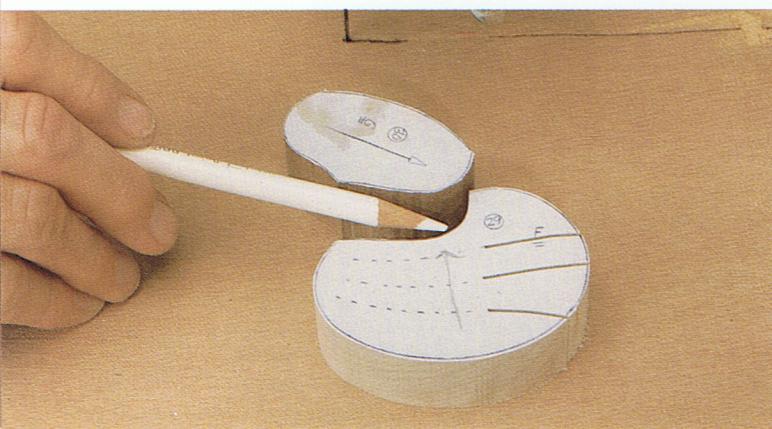


These sample curves are good examples of areas where special cuts are necessary. This concave curve here must be cut on-line, since it would be very difficult to sand down with the relatively wide belt sander. It is best to cut it as precisely to pattern specifications now, while you are using the narrow band saw blade.

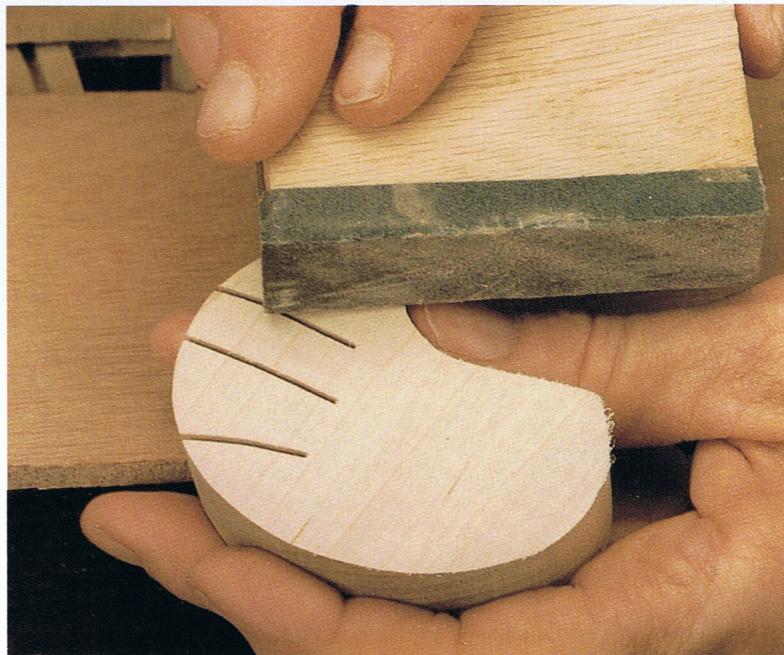
This adjacent curve, however, should be cut generously outside-line, since it is an easy-to-sand convex curve. Also, because this edge must fit up against the concave curve of the larger piece (an edge which cannot be altered much with the sander), all the fine-tuning will need to be done on the smaller piece. Leaving a lot of extra wood to accomplish this is prudent.



Looking back at the lion, you will see how this applies. Here I have cut outside the line, since this flat section of the muzzle will be easy to sand down later to achieve a perfect fit with the adjacent nose piece. Having the excess wood gives me room to fine-tune it later.



Here, however, I decided to cut mid-line, since the inside of a concave curve is very difficult to reach with the band sander. Since I will not be able to fine-tune the shape and size of this edge with the sander very well, I need to be as precise as I can at the cutting stage.

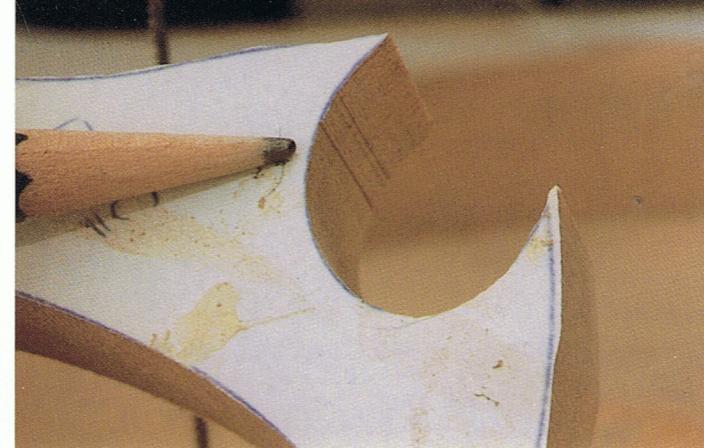


Correspondingly, I have cut outside the line on the nose piece where it matches up to the concave curve of the muzzle. Leaving extra wood on the nose piece here gives me more leeway to fine-tune it to fit against the muzzle. This is important, since I will not be able to make any significant adjustments to the inner curve of the muzzle itself.

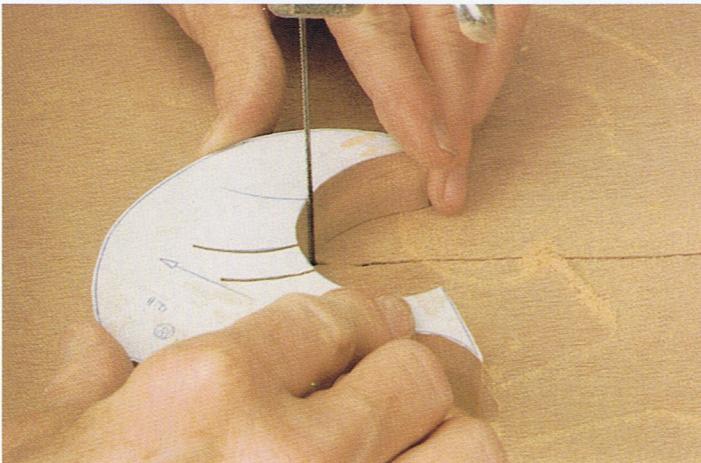
To smooth the fuzz down, use a block sander, or simply hand-held paper.



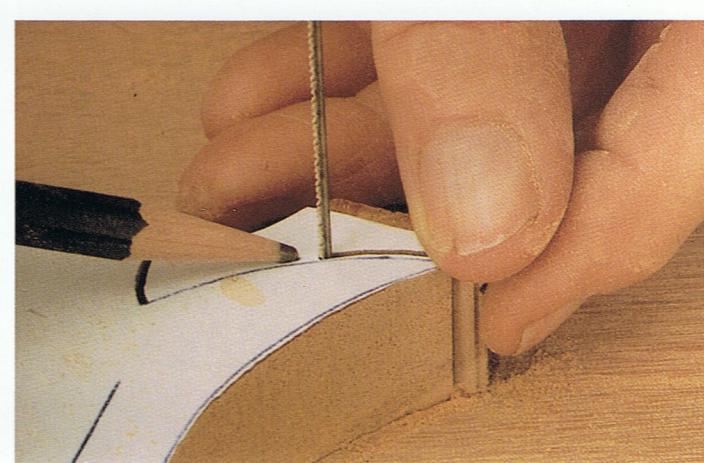
When you are cutting around a sharp corner like this one, it is a standard technique to use a loop to make the turn.



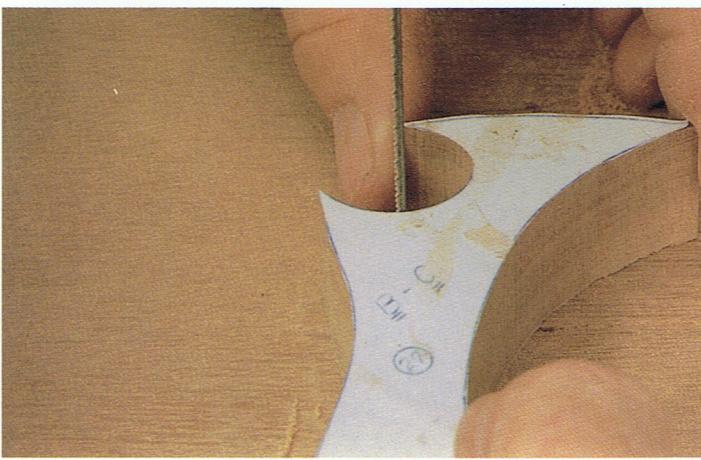
Vibration in your blade can cause ripples like these in the edge. If this happens, make sure the blade guide is properly set against the blade, the saw is solid on the floor, and the blade has proper tension.



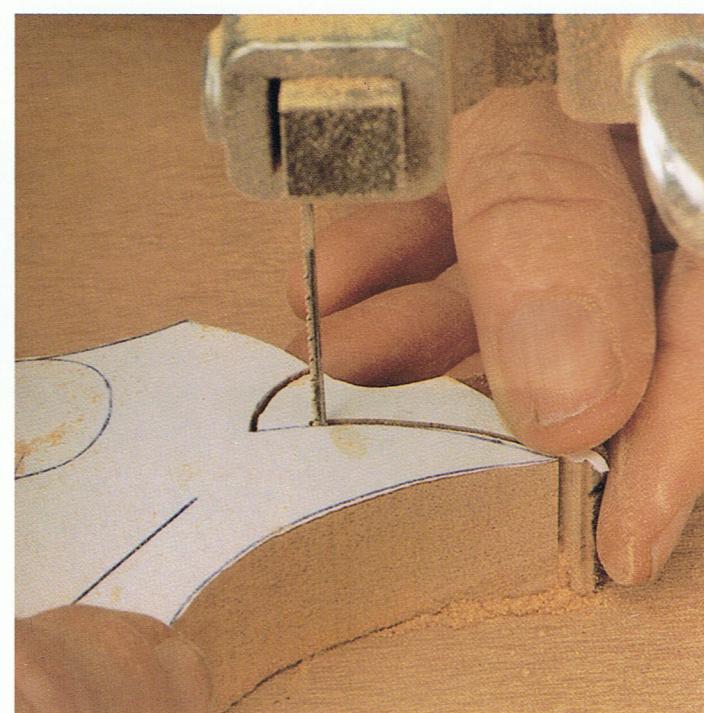
The whiskers on the cheek piece must match perfectly with the whiskers on the piece we previously cut. Again, start directly on the middle of the line, and cut in a smooth, firm line. Do not worry if you have trouble fitting the two pieces together now to check the whiskers. Later you will use the belt sander to size them together, and at that stage you can make the pieces fit so that the whiskers align perfectly.



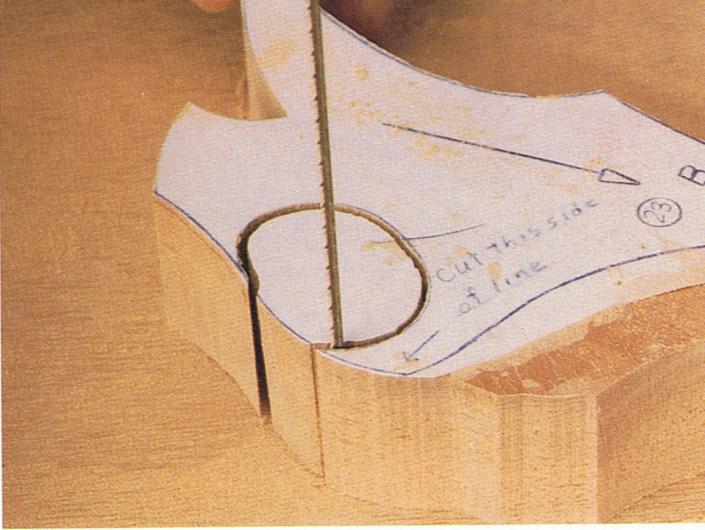
When you are making a cut approaching a sharp angle, you can begin by cutting outside of the line...



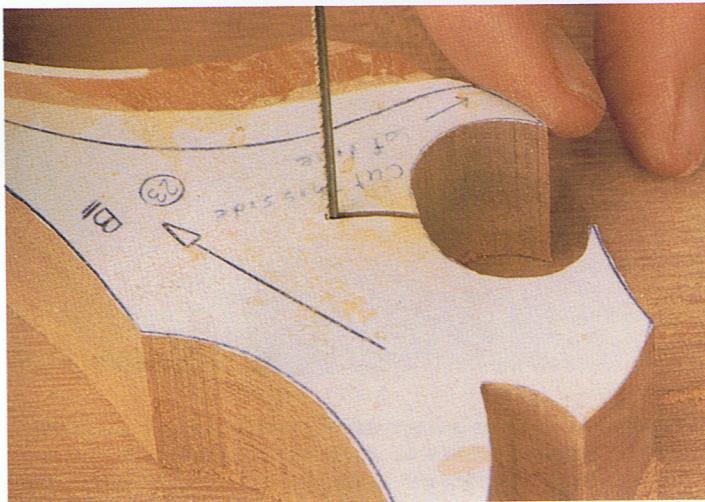
This piece has a very tight curve; it would be very difficult to shape inside it with the belt sander, or even with a small drum. Because of this, it is crucial that you cut the curve on-line, to minimize the sanding you will need to do inside it. When you cut the piece that fits inside such a tricky curve, cut outside the line; this leaves extra wood to compensate. This will allow you to do your fine-tuning work on the less intricate piece.



but as you get in towards the difficult-to-sand angle, cut on-line.



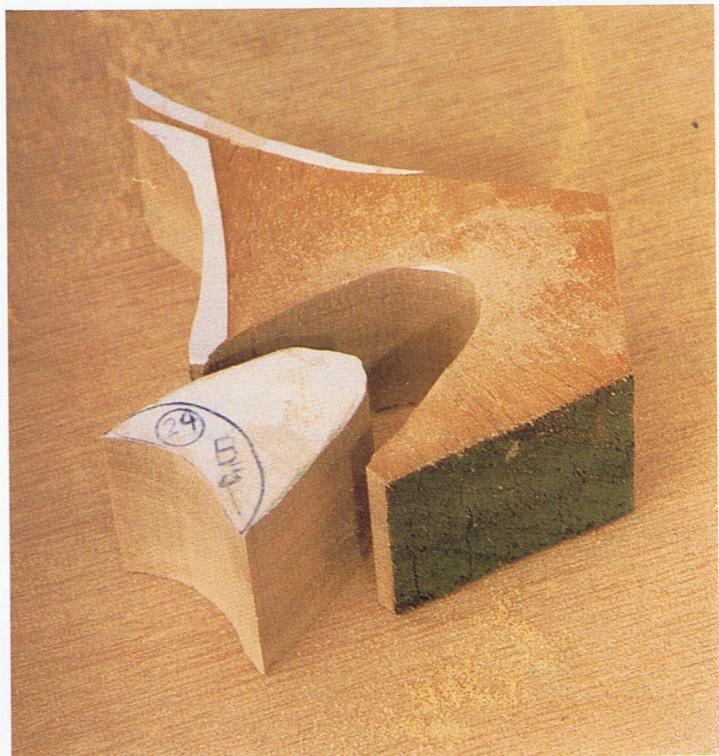
Here is another delicate cut — the eye socket. Try to cut it smoothly, close, and on-line. Later, you will have to remember to cut the eyeball outside of the line so there will be lots of room for you to sand it down to fit inside this tight curve.



Cut the short eyelash just like you cut the whiskers. It is safest to cut in the detail now, before you forget about it. Remember to shut off the band saw before you back out of the cut.



Here is the eyelid, with its attached handle. It is not important to cut the handle precisely — it will eventually be cut off and discarded. I have already cut the inside of the lid, however, being careful to stay on-line, since it is concave curve and will be difficult to sand.

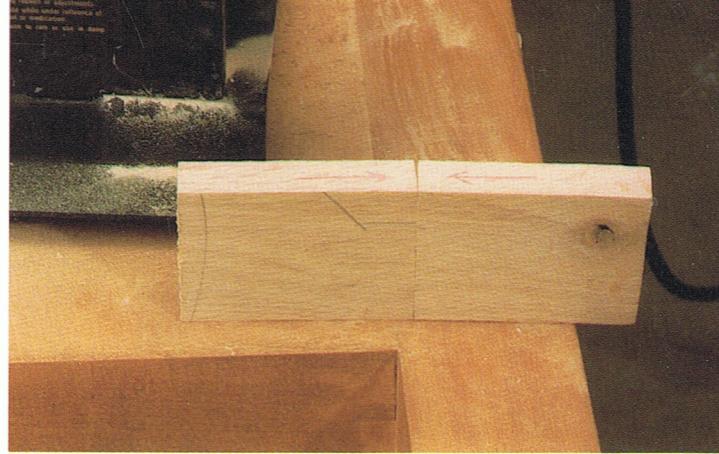


Here is the eyelid piece with its handle.



Here is one grouping of the face pieces. You can see on the edges (beneath the glued-on paper pattern pieces) that I have used several different colors of wood. I find it helpful to arrange the ‘puzzle’ of newly-cut pieces back onto the pattern sheet as I go; it keeps the project organized. The eye pieces (especially the lid with the handle) will not fit into this arrangement until we begin to sand them precisely with the belt sander.

Sizing With the Belt Sander

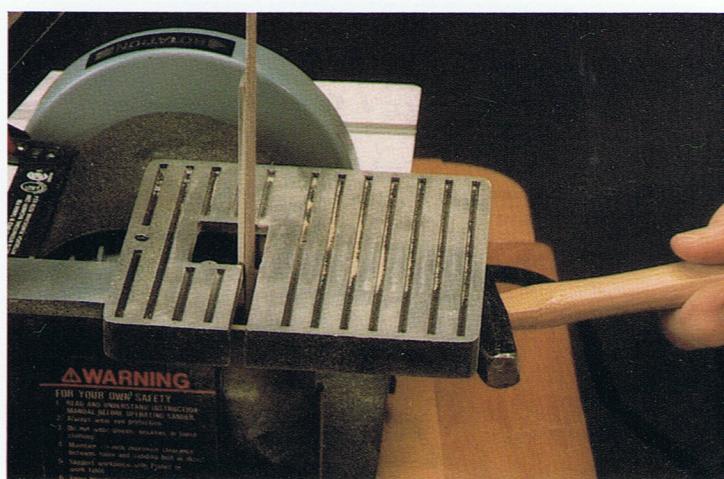


Before you begin to sand (or even make the wooden table for your belt sander), you should make sure the table is square to the platen and the belt. I have found that using a T-square is not always enough to be sure.



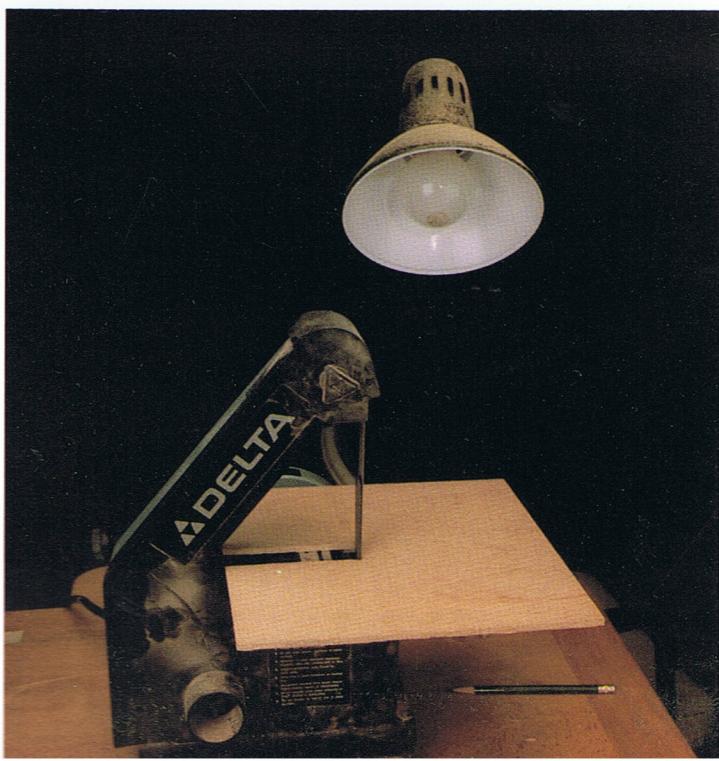
I use some 'fine-tuning blocks', cut especially for the purpose, to check my table. I sand each of them firmly against the platen,

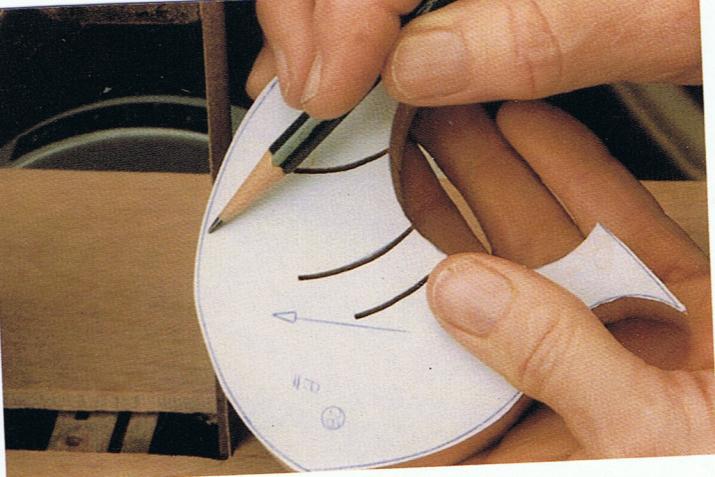
and check them against one another. If they do not fit perfectly, then the table is not square.



To adjust it, use light taps to the top or the bottom of the table with a mallet or a hammer. Continue checking, tightening the table, and tapping until your fine-tuning blocks come out perfectly. You should check this periodically throughout the project, since the pressure you apply as you sand your pieces may make the table surface or the platen go out of whack.

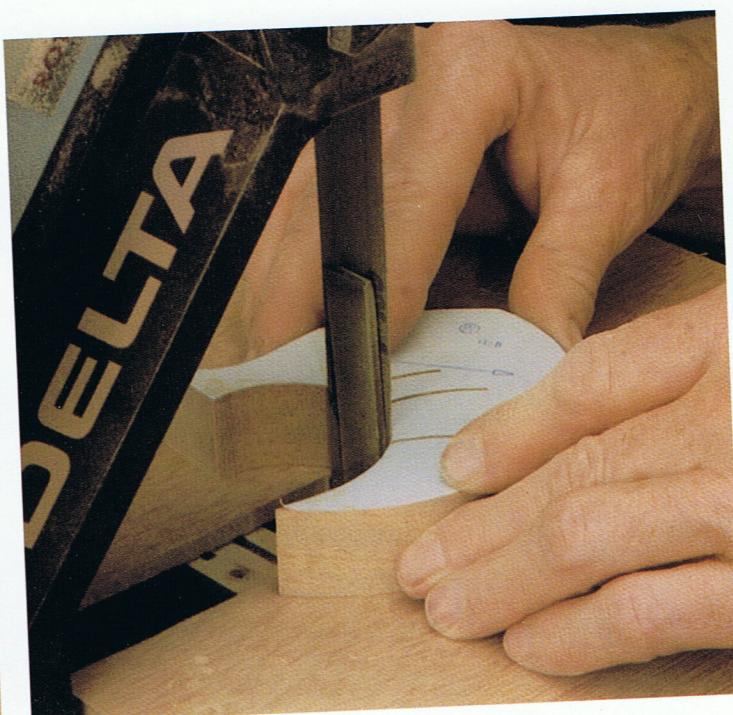
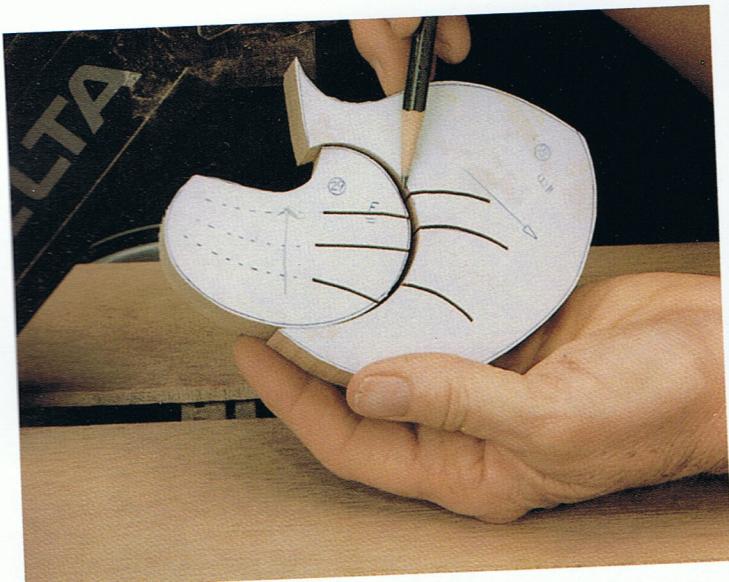
Again, make sure your work area is well lit, from two sides if possible.





I use 180 grit sandpaper at this stage. As I showed in the equipment section at the start of the book, you should use a platen that has been filed down some on the sides. This allows the sandpaper to bend around the metal so you can size your pieces with more flexibility, reducing the risk of the platen's edge digging ridges into the wood. I have filed this platen down to a width of 5/8". A commercial shop can do this for you if you don't have equipment on hand.

I will be sanding out this blue line. Always check by holding pieces under your light to make sure the blue line is completely sanded out.

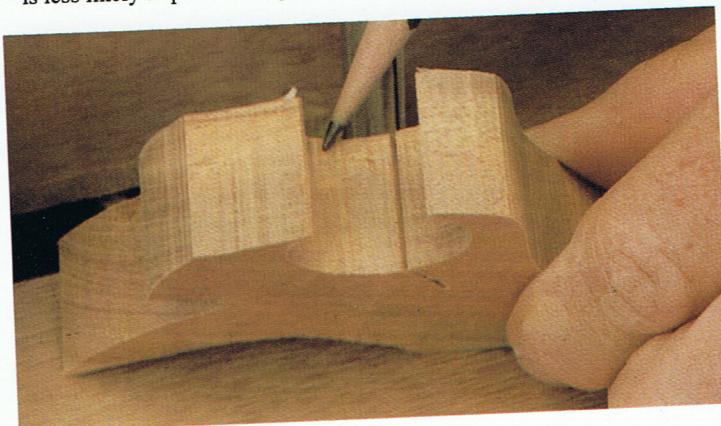


See how the muzzle and cheek pieces do not yet fit together; it is impossible to make the whiskers line up. In the first stage of sizing, I will simply sand out the blue pattern line on every piece; this will make everything very close to the final fit, and the whiskers should slip right into place.

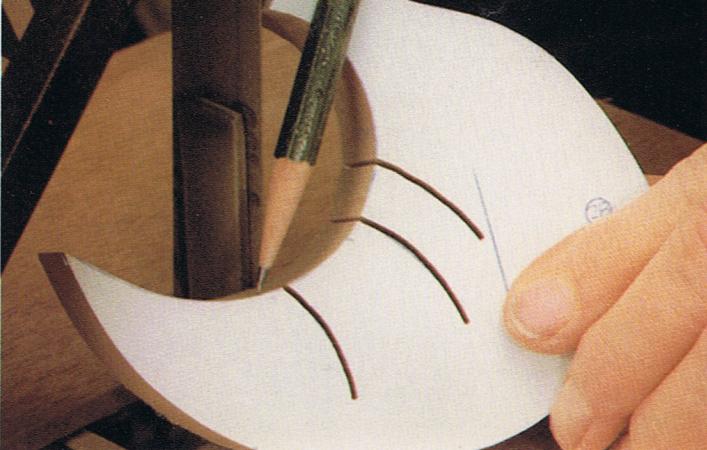
When I proceed to the inside curve, I must rotate the piece around the edge of the band to reach the spots I need to sand. Since the platen has been filed down, the band can move flexibly with the rotation; the platen is less likely to press its edge into the wood to leave ridges.



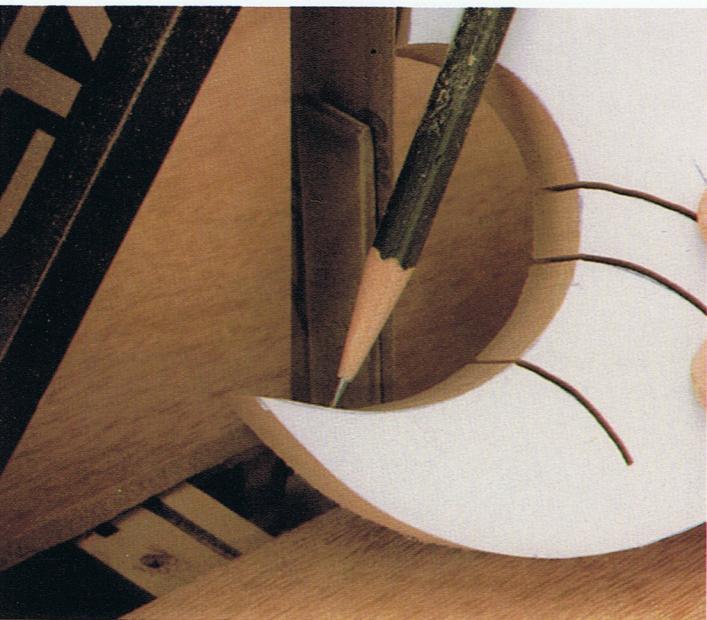
I will start with a gentle, curved piece, which is easy to sand on the belt.



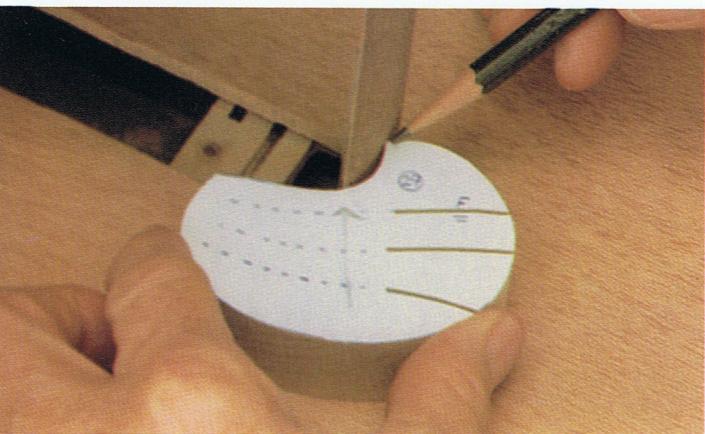
Be careful, though; if you are working with a very tight curve, the edge will still create ridges. This is why I cut on-line as much as possible for the tighter curves.



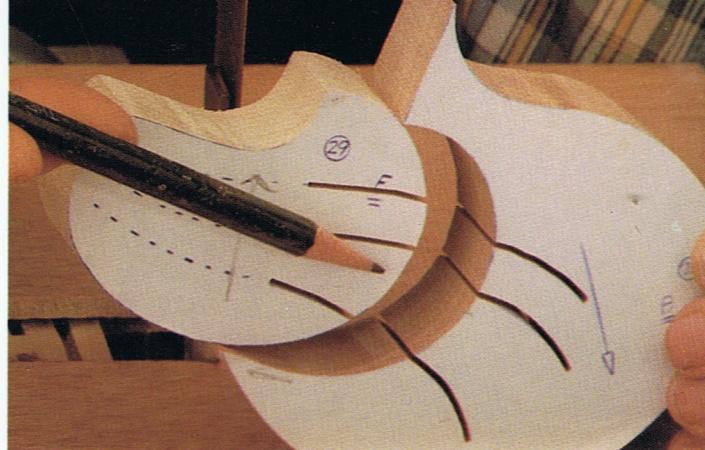
Because I knew the inside of this curve would not be easy to fit and size with the sander, I cut it on-line during the cutting stage. Now I have less work to do.



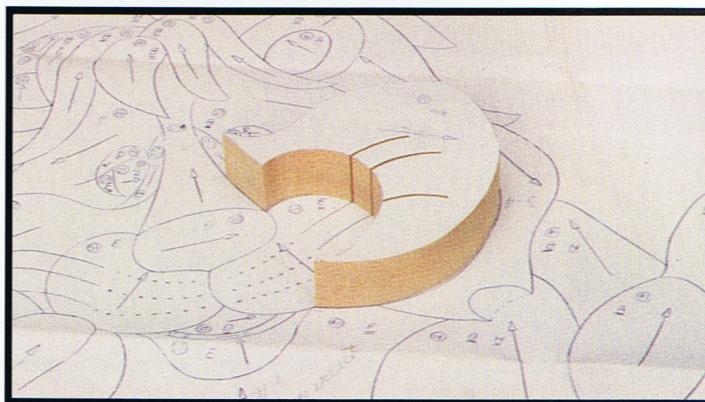
I cut the tip of it outside the line, however, because it is not so difficult to reach with the belt.



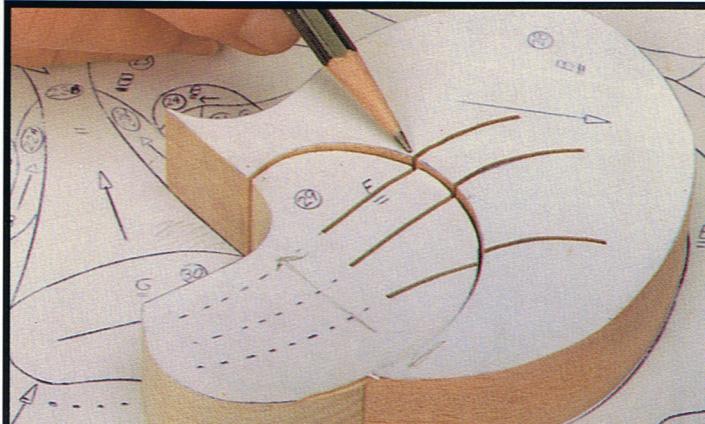
Here I am working on another inside curve, trying to sand where my light pencil-drawn arrow indicates. But look! As I work with one side of the belt to size the inside of the curve, I am about to accidentally sand away a whole corner! Always pay attention to what the other side of the sandpaper belt is doing. If I hadn't noticed this, I would have had to cut a whole new piece.



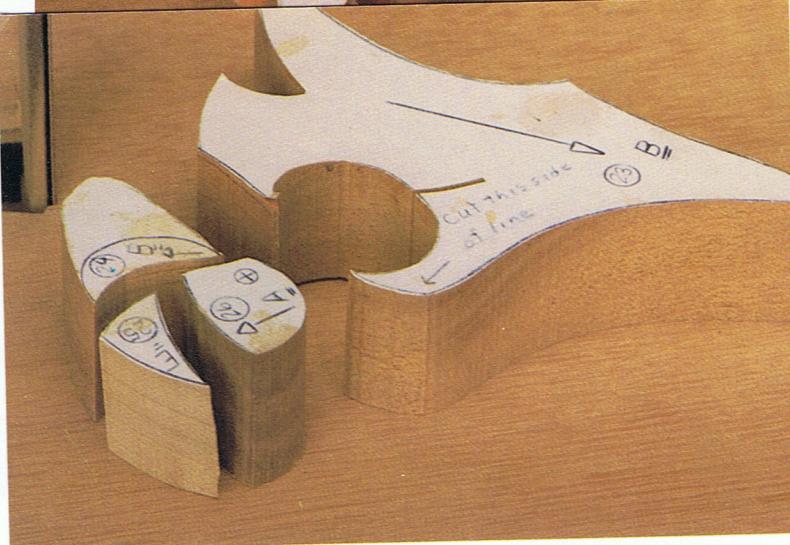
As you sand the blue pattern lines out to size the pieces together, you will quickly see the advantage of planning ahead. Because the convex edge of the small piece's curve (where I am pointing) is much easier to sand than the corresponding concave edge of the large piece, I left the excess wood for fitting them together on the smaller of the pair. I cut the large concave curve as closely as I could, so that I would have only a little bit of sanding to do there. Always use a hand block sander or piece of sandpaper to remove any fuzz from the back edge of the piece before moving on.



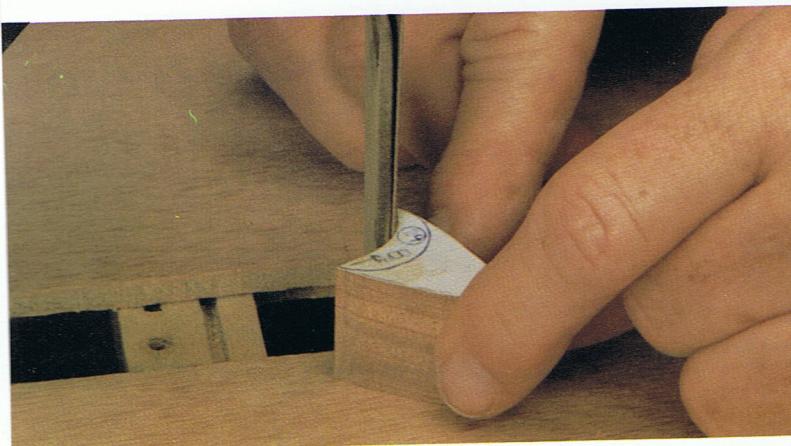
As I size each piece, I lay it down on my pattern. This helps me keep track of my progress. Because sanding leaves a fuzz on the pieces (just like cutting did), be sure to sand off the fuzz with a hand block sander or a piece of folded sandpaper before you check the fit. The fuzz can make pieces that really are well-fitted seem to be misaligned, and can also ruin the squareness of the piece.



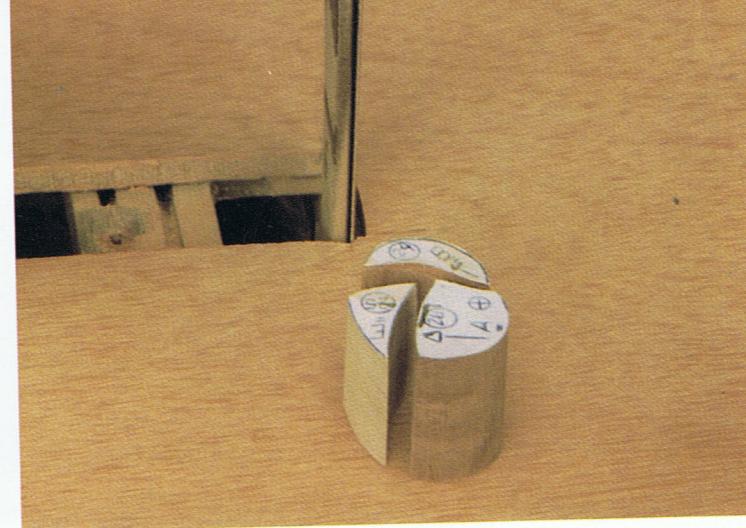
When you lay each piece down on the pattern, it is easy to see how they are fitting together. Even though I have sanded out the blue line on both of these, they do not quite match up yet. Do not be concerned; during the second fitting stage that will all be taken care of. For now, sanding out the line is the main concern.



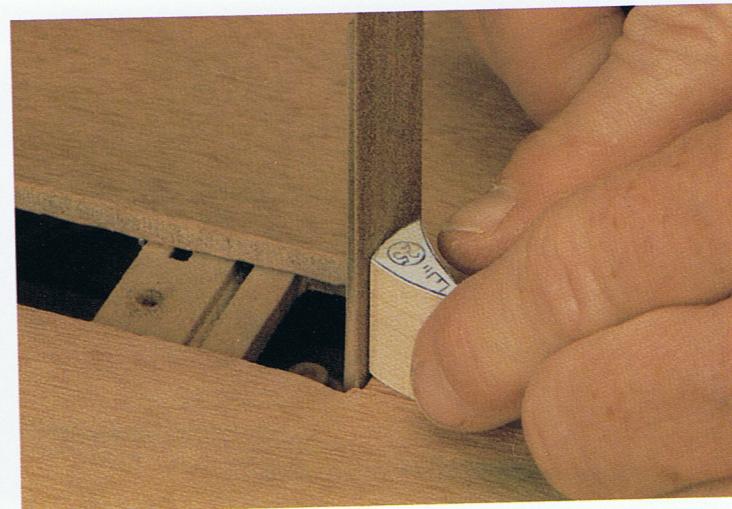
Here are the eye pieces (pattern piece #24, the lid; #25, the white; #26, the pupil) before they have been sized on the belt sander. They are all too big to fit into the eye socket (#23), but sizing them will take care of that. Notice the handle I drew and cut in for the eyelid piece.



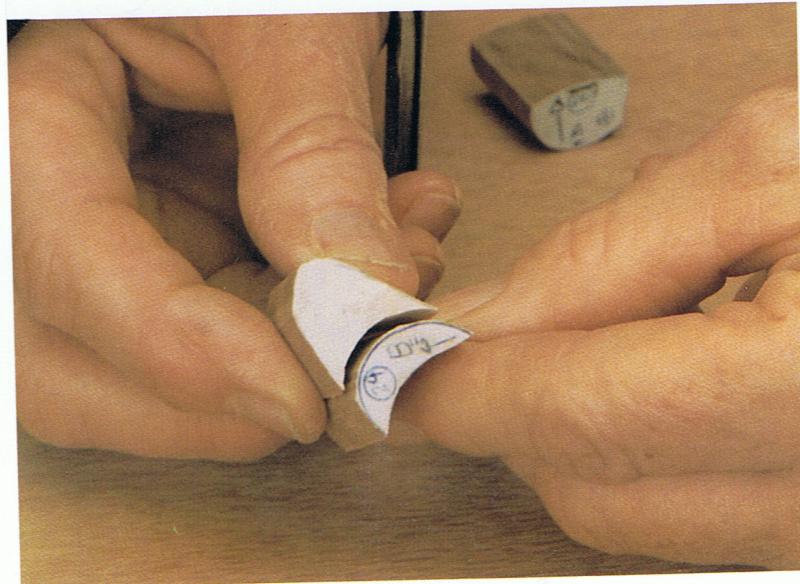
Here you can see how important it is to leave the handle. Without it, sanding the inside of the eyelid's concave curve would be delicate and dangerous work!



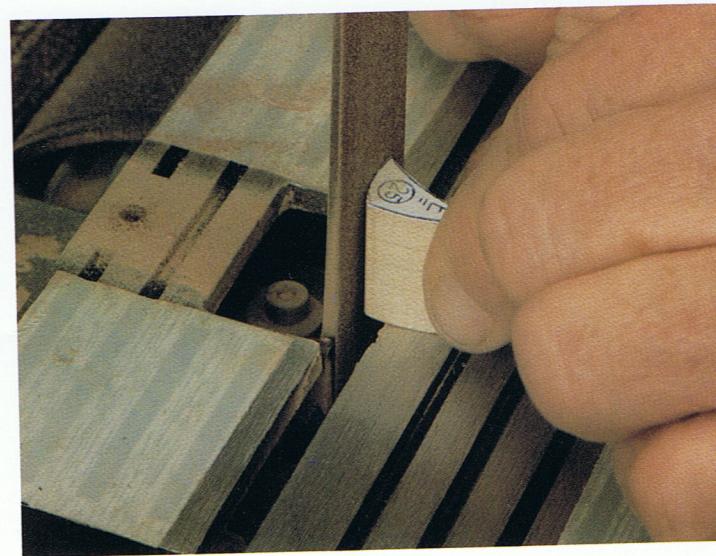
Here are the eye pieces (#24, #25, and #26) again, ready to be sized.



Working with small pieces should show you the importance of the wooden band saw table I constructed. See how close I can hold the piece to the band? Auxiliary wooden tables for both the band saw and belt sander are important.



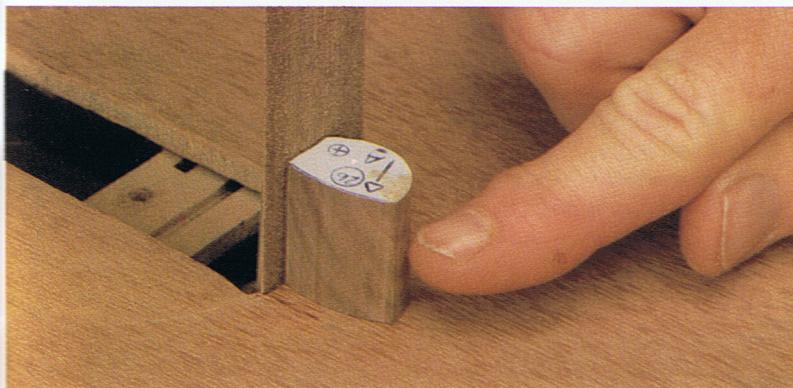
Once that curve is done, it is safe to cut off and discard the handle. Soon, I will show you how to use the other eye pieces as a handle to sand the eyelid's new top curve.



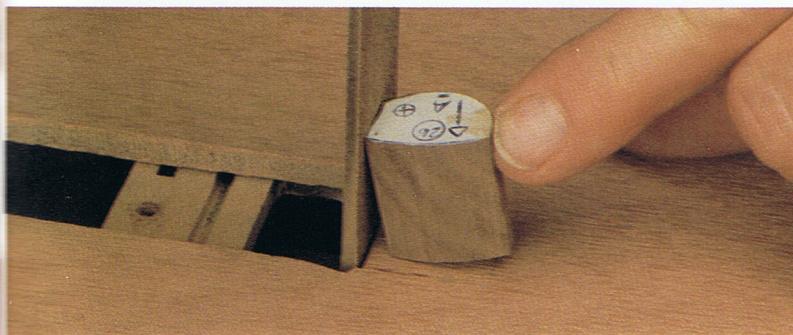
Without the wooden table cut flush to the belt, I would be forced to work over a large gap between the table and the band. This could make the piece uneven, and can even be dangerous.



Keep in mind that the wooden table is no better than the original metal one if you do not keep it flush against the belt.



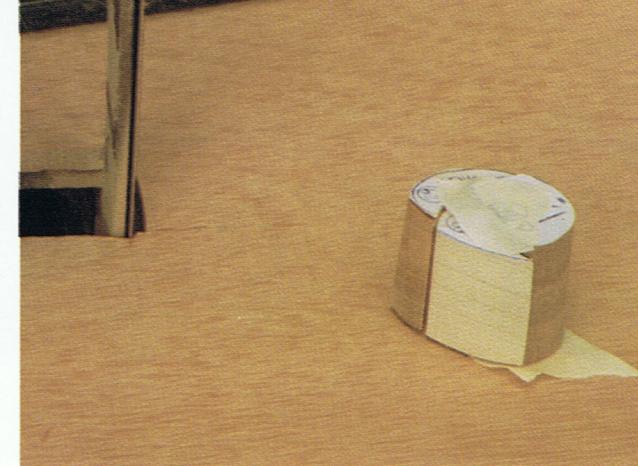
As you sand, be sure to apply pressure evenly with your fingers, holding the piece in the middle. If the piece is very small, and you forgot to leave some wood for a 'handle', it may be necessary to glue or tape on an extra scrap to use for control and balance.



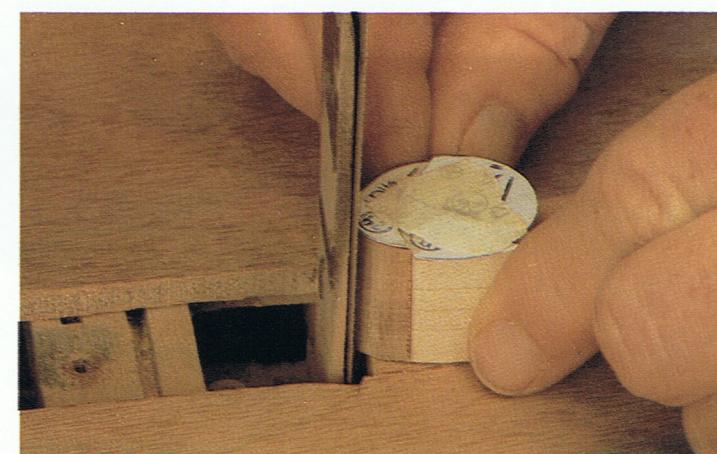
If you apply more pressure at the top, your lion will have gaps between adjacent pieces at the top surface of the work, which will make it difficult to tell whether the pieces fit properly at the bottom or not.



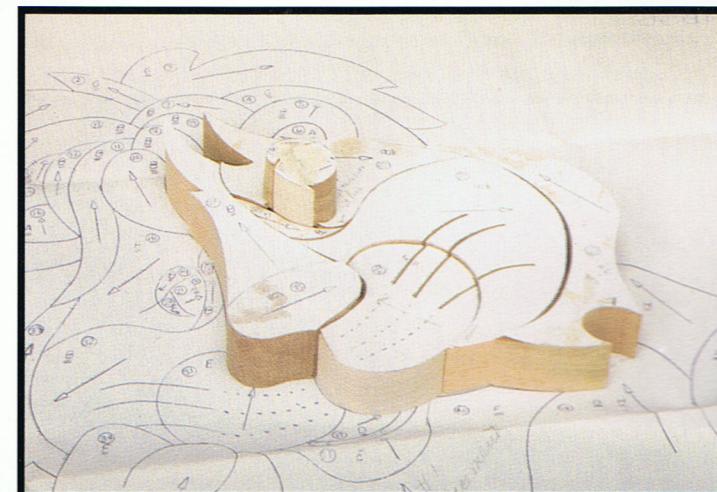
If you apply more pressure at the bottom, your lion will have gaps at the base of adjacent pieces, ruining the fit.



After the white and pupil pieces (#25 and #26) are sized, I tape them together to make a bigger unit, just as they will fit in the final arrangement.



The unit as a whole can now serve as a 'handle' for the top convex curve of the eyelid! Now I can sand out the blue line of the curve, as I've done with the rest of the pieces.

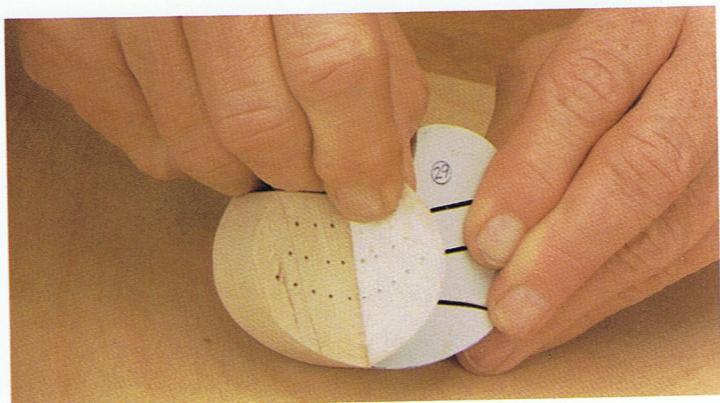


Here is the eye and face section laid out on the pattern. These pieces have all been through the initial sizing stage. They do not fit precisely (especially the eye, which is a little too big to fit into its spot) but that will come soon. For the most part, I have sanded out the blue lines. Exceptions occur where I anticipate that I will need extra wood to fit particularly delicate areas, like the eye; there, I leave myself a lot of leeway for sanding during the fine-tuning stage, when I will use a light table for precision. After I finish the initial sizing for the rest of the lion's pieces, I'm ready to begin fine-tuning.

Fine-Tuning the Pieces

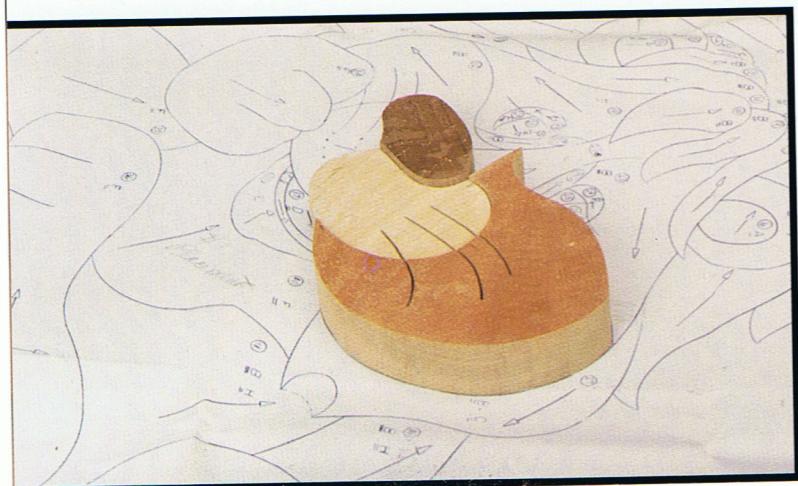


As you remove the paper, there are a few things you should keep in mind. First, take care of any detailing that may be indicated on the paper pattern piece. For this lion project, you will only need to worry about the whisker spots on the muzzle, and the eye.

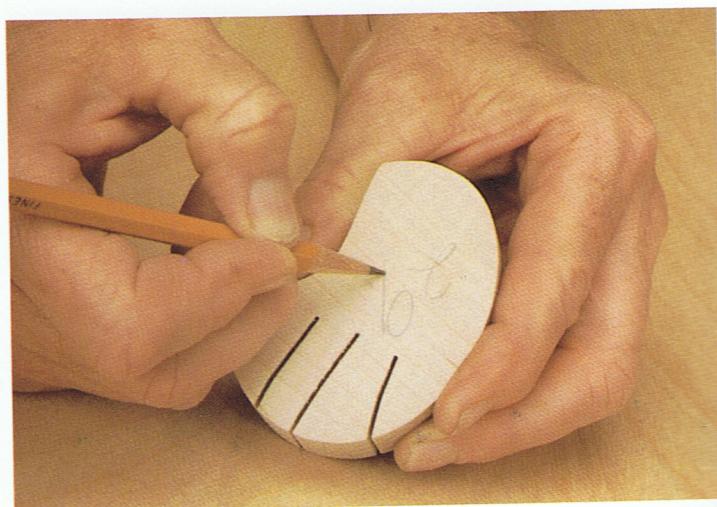


During the fine-tuning stage, you will need to have a clear view of each piece. You will be using a light table to help with this; instructions for improvising a table are given on page 6. Also, I switch to a 220 grit belt.

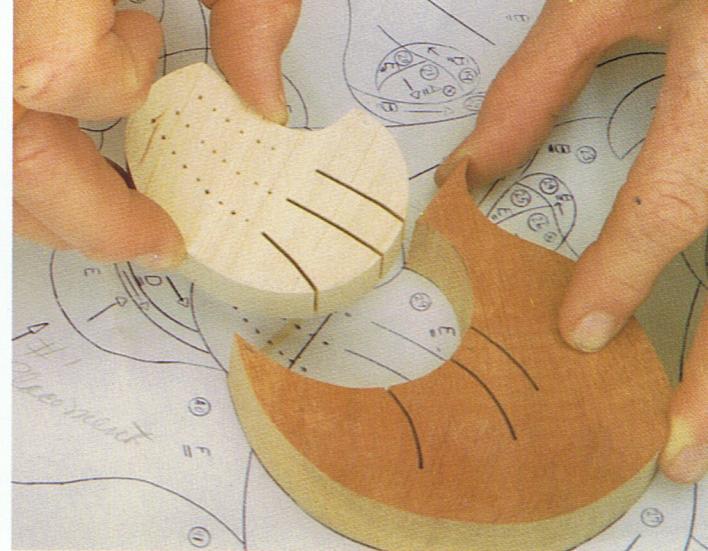
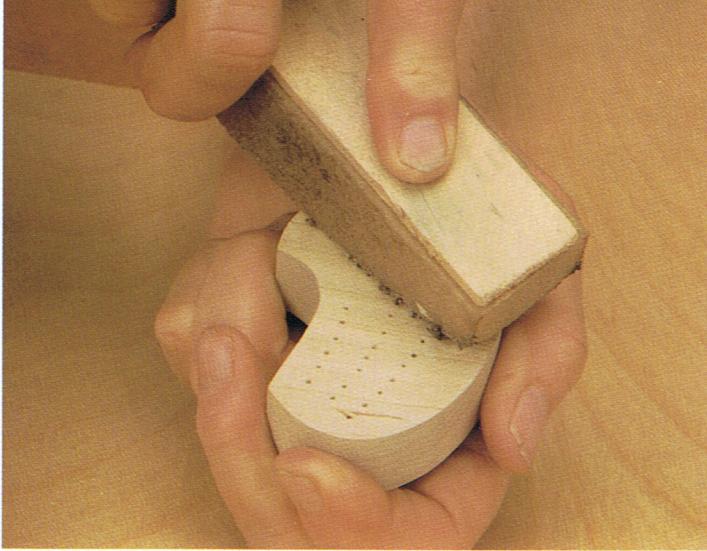
Use an awl or a nail to tap through the paper pattern, making indentations about $1/16"$ deep on the muzzle.



It is also necessary to remove the glued-on paper patterns as I work with each piece. Since I have already sanded out or into the blue lines wherever I chose to, the paper is no longer necessary for fitting. It is more important to see the lines of the wood itself, not the paper pattern. (Remember, however, to keep the eye pieces taped into their units, so they can be shaped to fit into the sockets.)

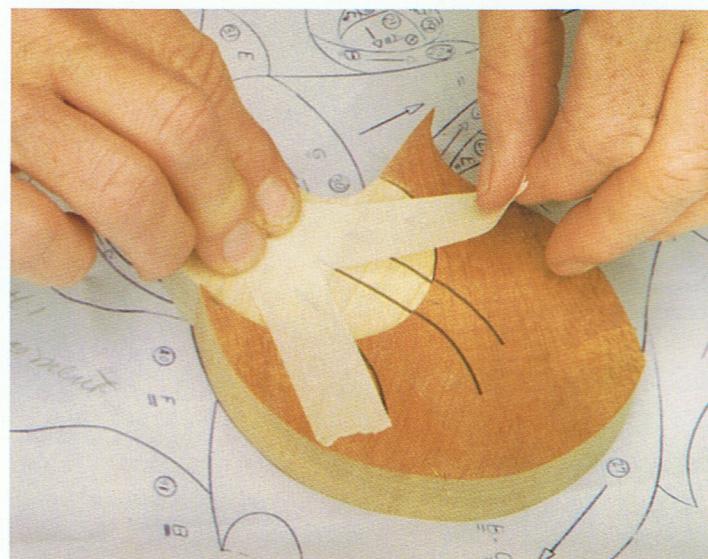
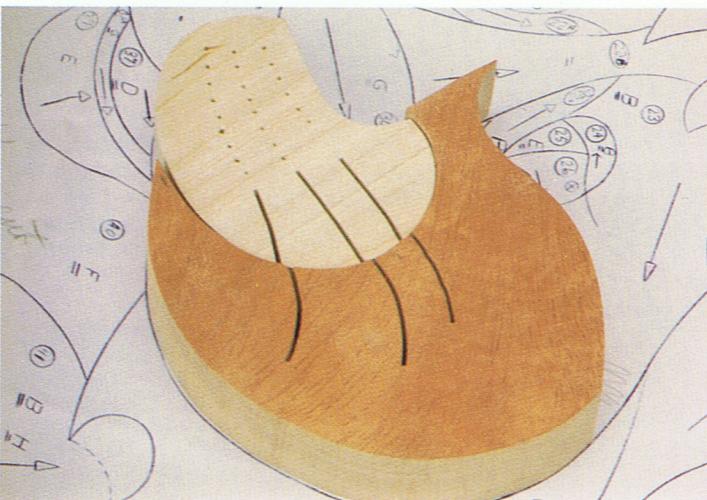


It is also necessary to write the piece number in pencil on the back of each piece. This will keep your pieces organized, especially in the mane, where so many pieces of similar shape are placed. It will also show which side is the back, crucial for pieces that come in mirror-image pairs like the two muzzle pieces. It is very easy to flip a piece over by accident and start to fit it into the opposite side — a mistake that is hard to correct once you start to change the fit!



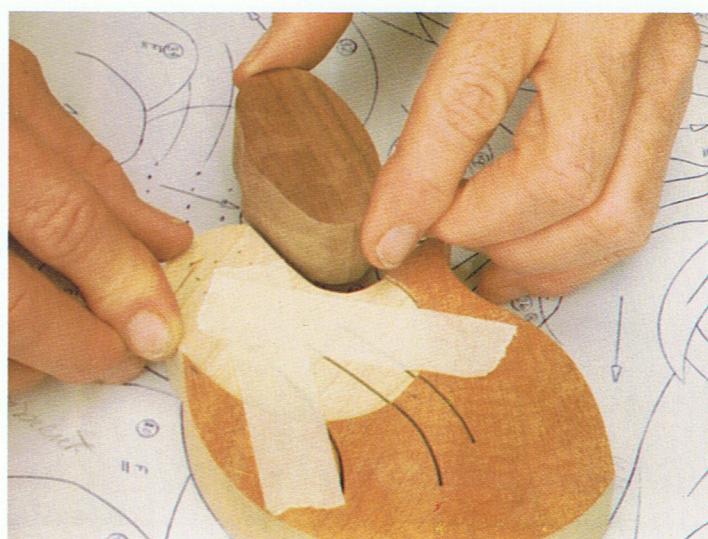
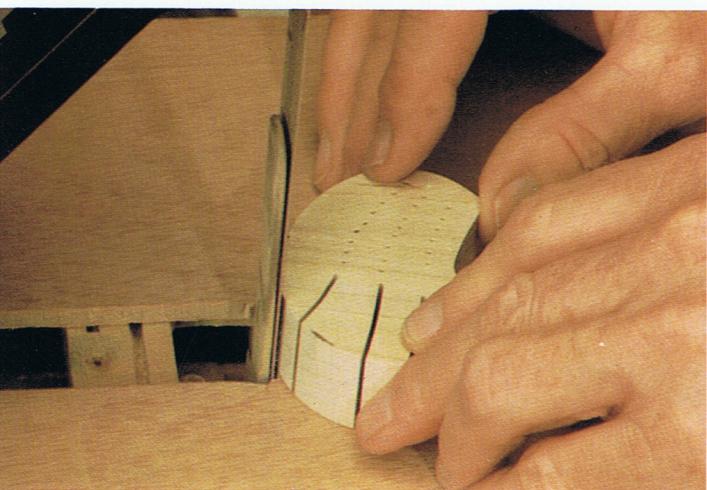
Be sure to remove the rubber cement that you used to attach the paper pattern pieces. I am using a belt eraser here to rub off all the adhesive. This tool can be used in the future to rub out pencil lines. Rubbing out with your fingers can collect splinters!

Return to the pattern to check them after each sanding.



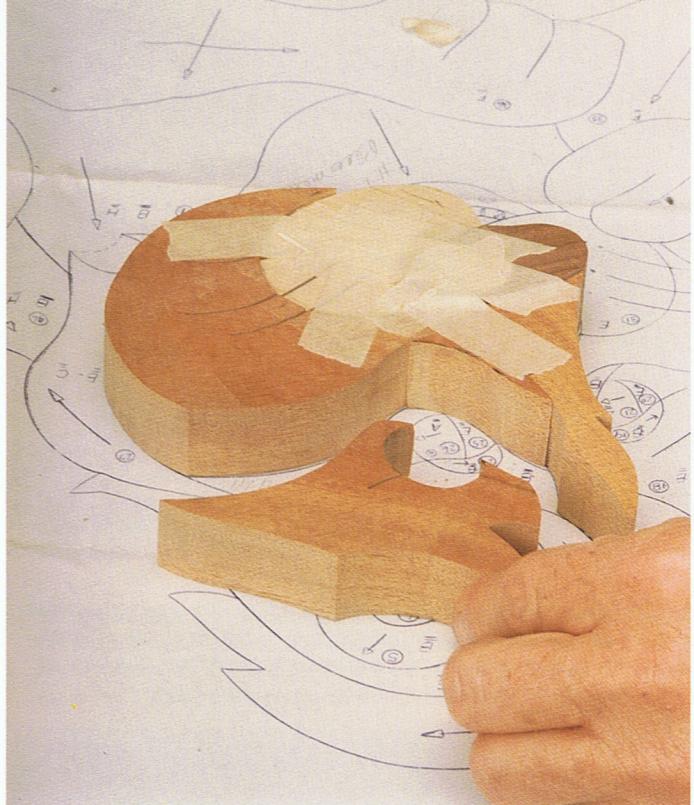
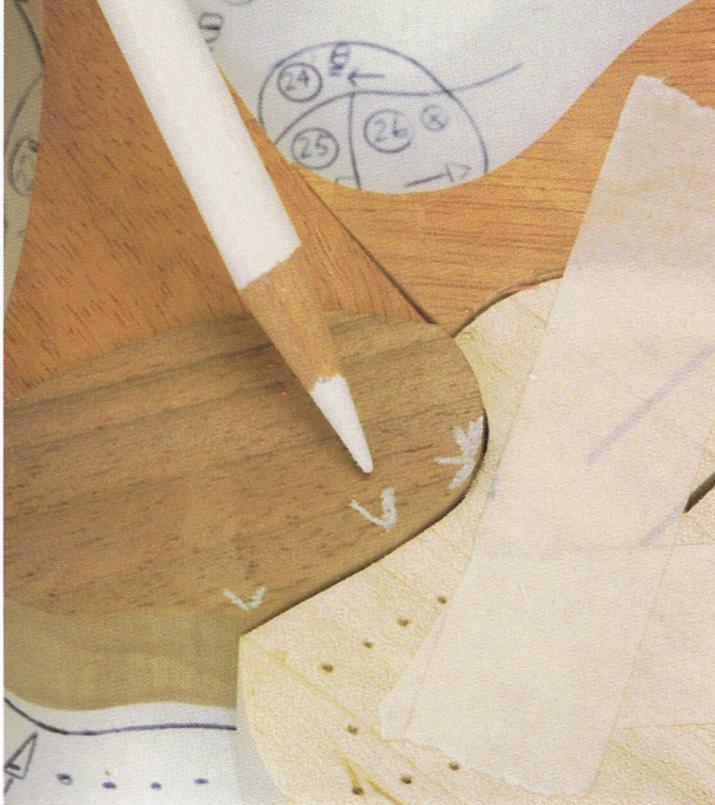
Here are the muzzle and cheek pieces, laid out on the pattern. The light from the light table shows that there are several spots that need to be touched lightly with the sander — feathered — to make them fit snugly, and to align the whiskers perfectly.

When you have gotten them to fit perfectly, tape them securely together. Place the tape in diagonal stripes, or cross-hatch.



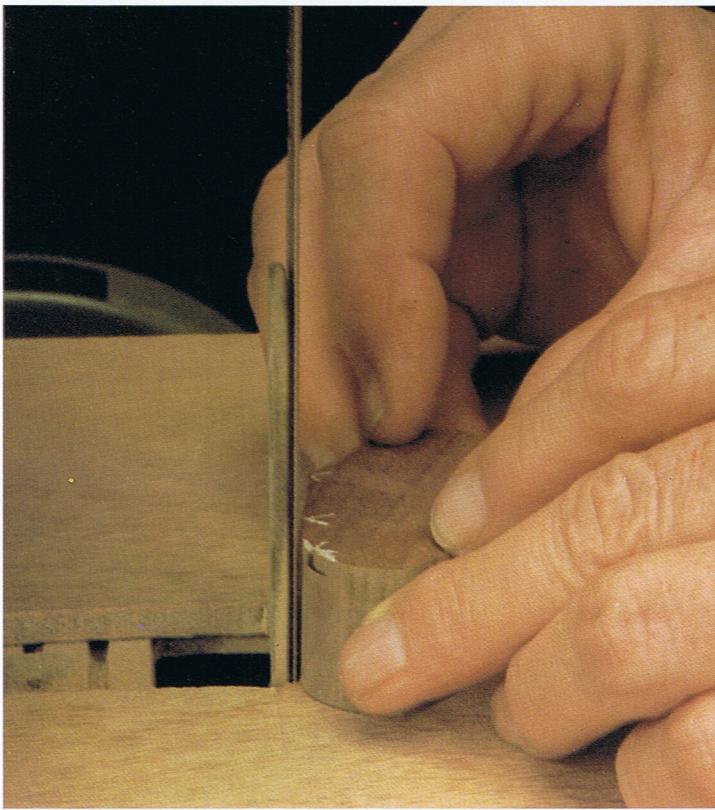
I return to the belt sander, using 220 grit sandpaper.

This will allow you to start fitting other pieces in without disrupting the fit you have already completed.

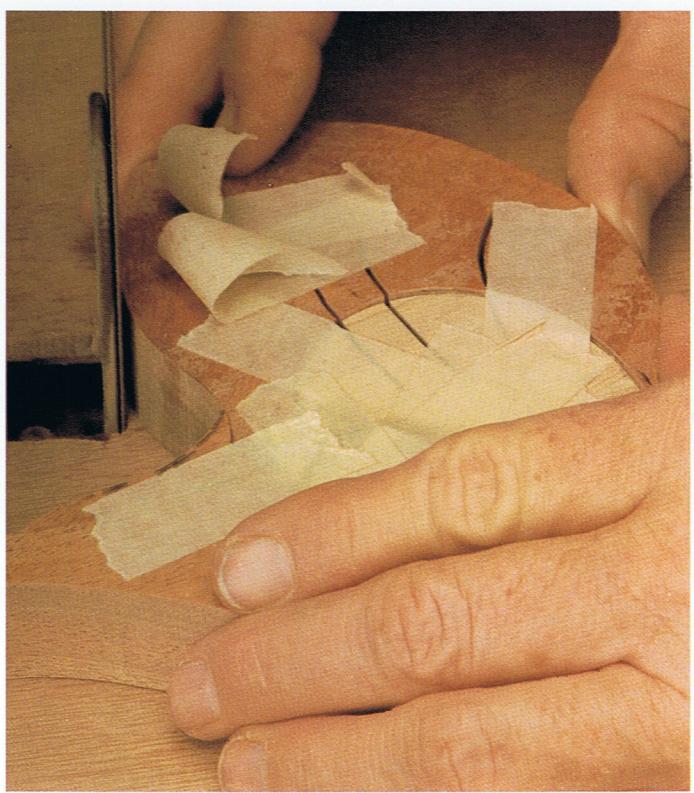


The light table shows me the spots that are keeping the nose from fitting in well. I will mark the trouble spots with pencil marks (using a white pencil on dark wood, and a black pencil on light wood), so I know where to sand them at the belt sander. I use a soft paint brush or tack-cloth to remove dust.

Deal with each piece in turn: remove the paper pattern, record the number on the back of the wood, fine-tune the piece, and tape it securely into the growing arrangement of fitted pieces. You can see how I use the taped portion as a *unit* into which the next piece must be fitted. I find it helpful to work with the figure in several different units — the face, the torso, and the haunches.



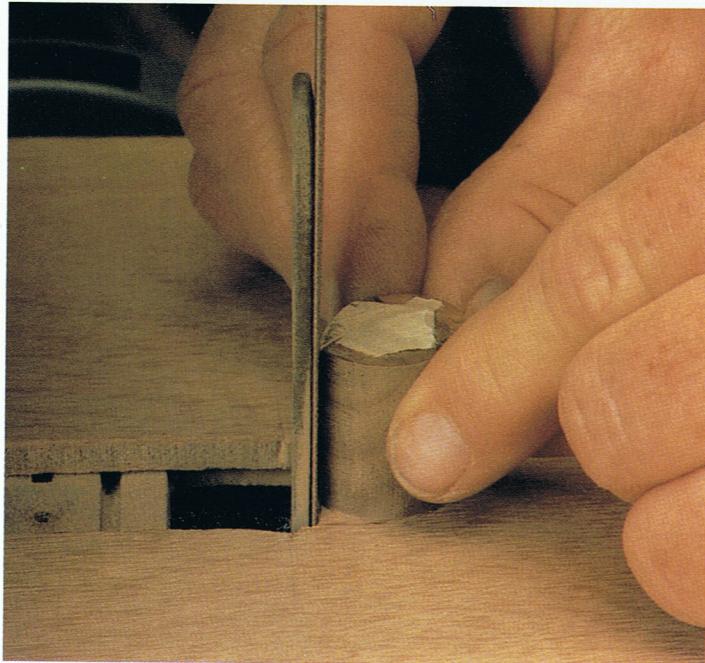
I will return to the sander to sand it down, using very light, feathery strokes. Be sure to erase any marks you make each time you check it — it is easy to forget which marks you've already sanded and which are a new set.



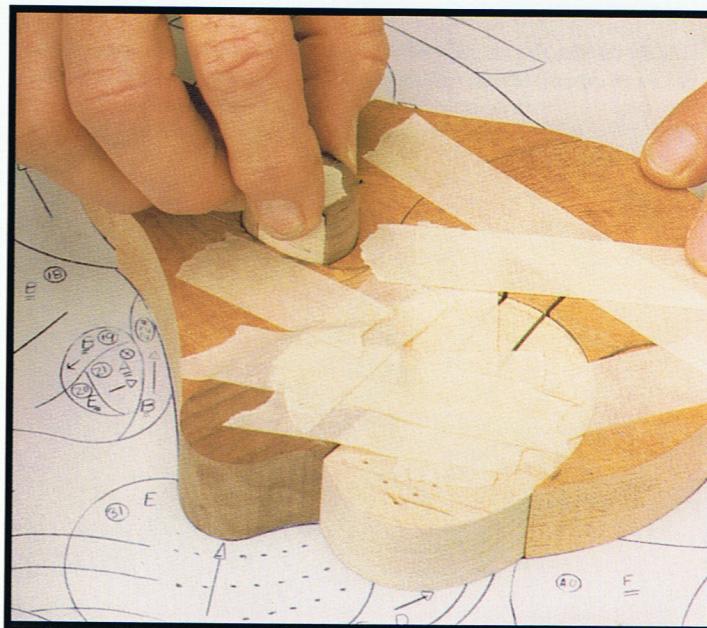
Here you see the face unit being sanded so that the next piece can be fit against it. Because the unit is well-taped together, I do not have to worry about the pieces shifting or needing to be re-assembled after making this change.



Once the area surrounding the eye is perfectly fitted, I can start to consider sizing the eye itself. Remember, the three eye pieces — lid, pupil, and the white — should stay taped together as you size them, since they must fit into the smooth, round eye socket as a single unit.

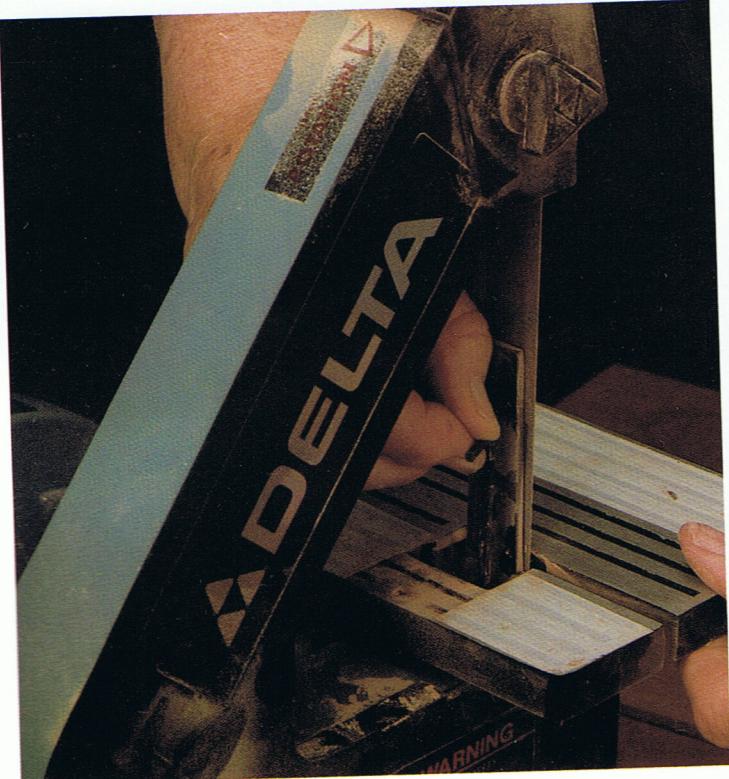


Here see the eye being sized on the belt sander as a unit



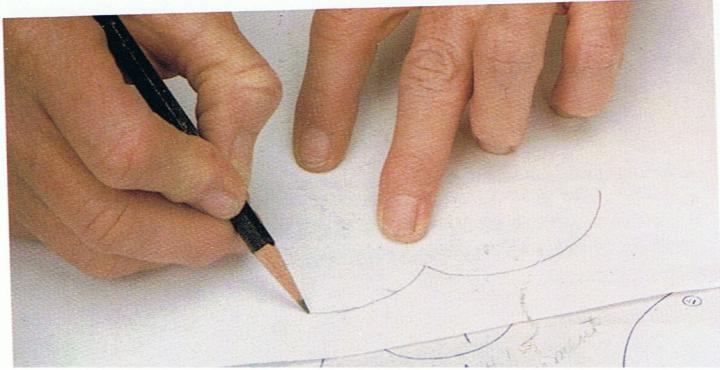
When the eye unit is perfectly sized, it will slide right into place. Now I will fit and size the rest of the lion pieces, so that I can begin the shaping process.

Shaping the Pieces

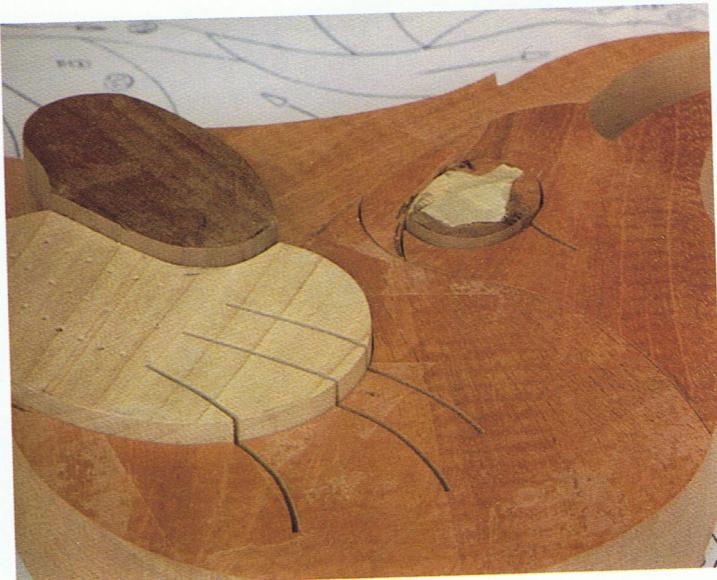


During the shaping stage, you will round and contour the tops of the pieces on the belt sander, adding depth and character to the lion. To do this, take the platen completely off of the belt sander and use 180 grit paper. You can also remove the wooden table top, since you will not need to be holding pieces square to the belt.

I would like to make the muzzle and nose of the lion (#29, muzzle; #30, nose; #31, muzzle) stand higher than the rest of the face, to add extra depth. To do this, I will cut out a 'lift' from plywood to place underneath it. This must be done before I begin to shape, since it will affect how the edges of these pieces relate to those around them. I trace the shape of these pieces from the pattern, and use the tracing as a pattern for cutting my lift. I cut 1/16" to 1/8" inside the traced line to make the lift slightly smaller than the pieces themselves.

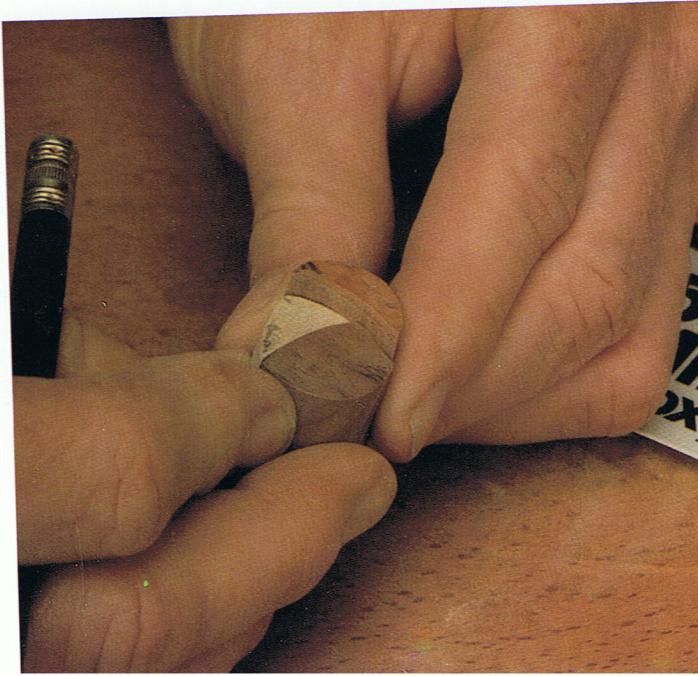


You could trace the pattern around the actual wooden pieces themselves instead, if you prefer. After the lift is cut, arrange the wooden pieces on top of it.



You can see the subtle difference in height this makes.

You will need to achieve a similar effect with the eyelid, and later, with the end of the tail.

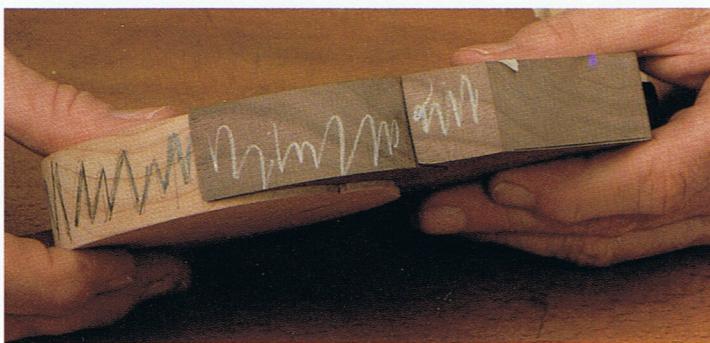




A small piece like the eyelid can be given a 'lift' simply by gluing it in a raised position with Epoxy after applying the finish.



When you are finished with the first piece, trace its height onto an adjacent piece so you know how far down you have to shape the next one. If you shape lower than your line, you risk having to go back and adjust the depth of the first one.

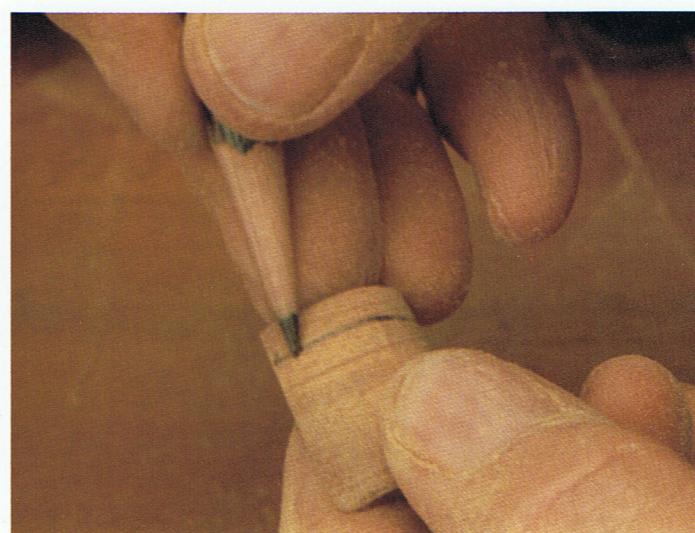


To help guide you through the shaping process, use pencils to mark all the edges that will be visible in the completed figure—the edges you traced to get the outline for the backboard. This entire outside edge of the lion will be sanded smooth, from the top to bottom of the edge, since it will all be visible. It is important that you mark these edges (as I have done here) so you will know where it is safe to sand. If you sand smooth an *inside* edge—an edge that joins adjacent pieces together, which you were so careful to fit together perfectly—you will ruin the fitting. Here, you can see that I have marked the edges that *will* be completely sanded. These marks should not be removed until the lion is completely shaped. The segment on the right is not pencil-marked, since it is not an outside edge; an adjacent piece has already been fitted to be placed next to it.

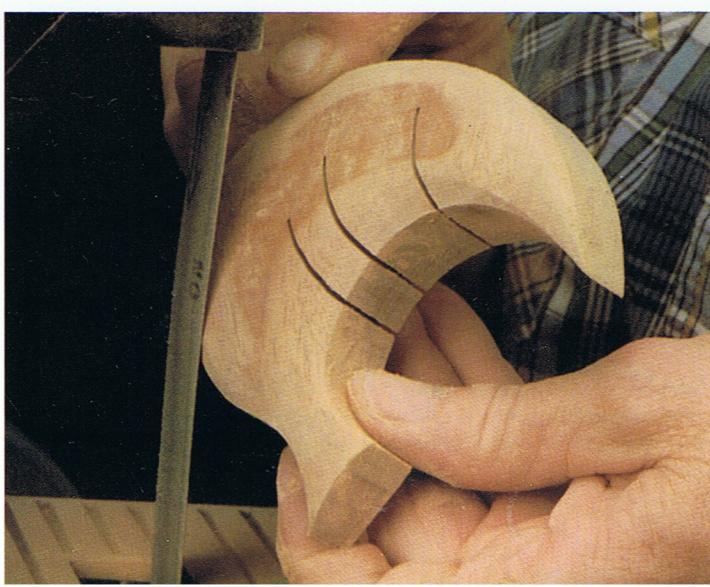
After figuring out which edges you will have to sand entirely, you can begin to shape your first piece.



Shape the second piece. Try to end the shaping for each piece with strokes in the direction of the grain, for smoothness.



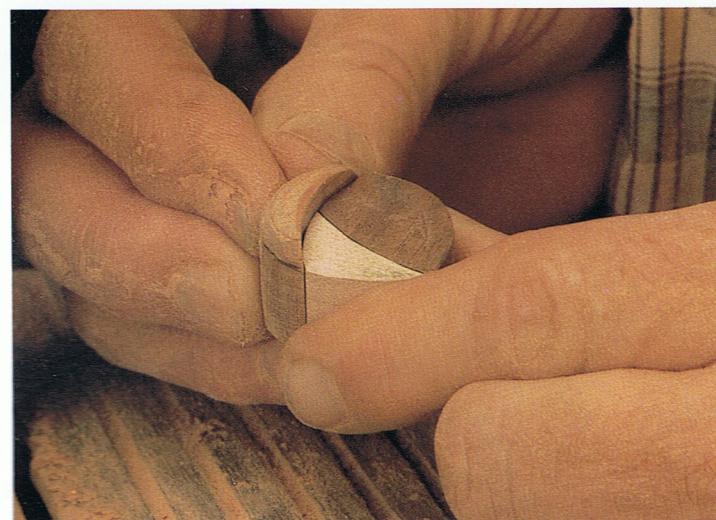
I've decided that the lift for the eyelid will raise this much above the other pieces...



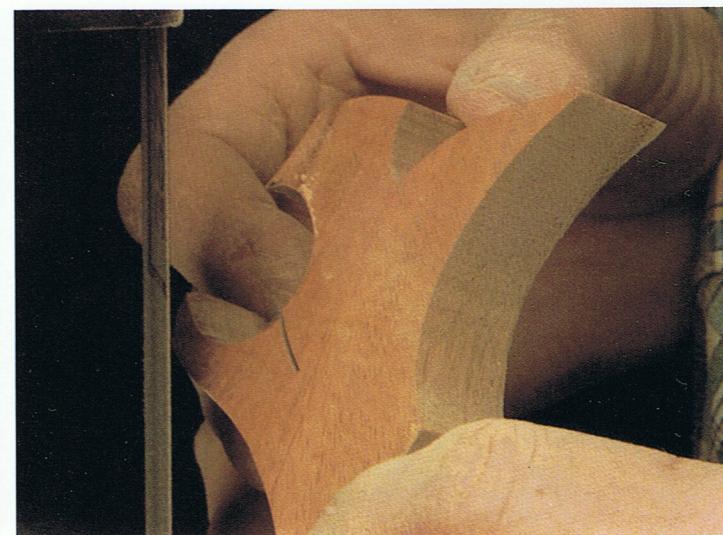


...so after the surrounding eye socket and entire face is shaped, I can shape the eye. Make sure both eyelids are the same height relative to the eye and face pieces.

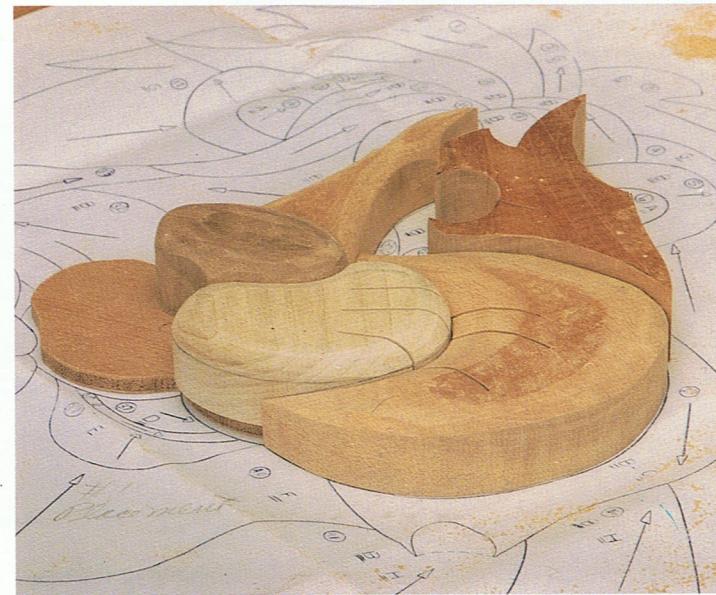
Ripple marks like these, made by cutting roughly at the beginning, must be taken out at the shaping stage.



See how the eye will fit together.



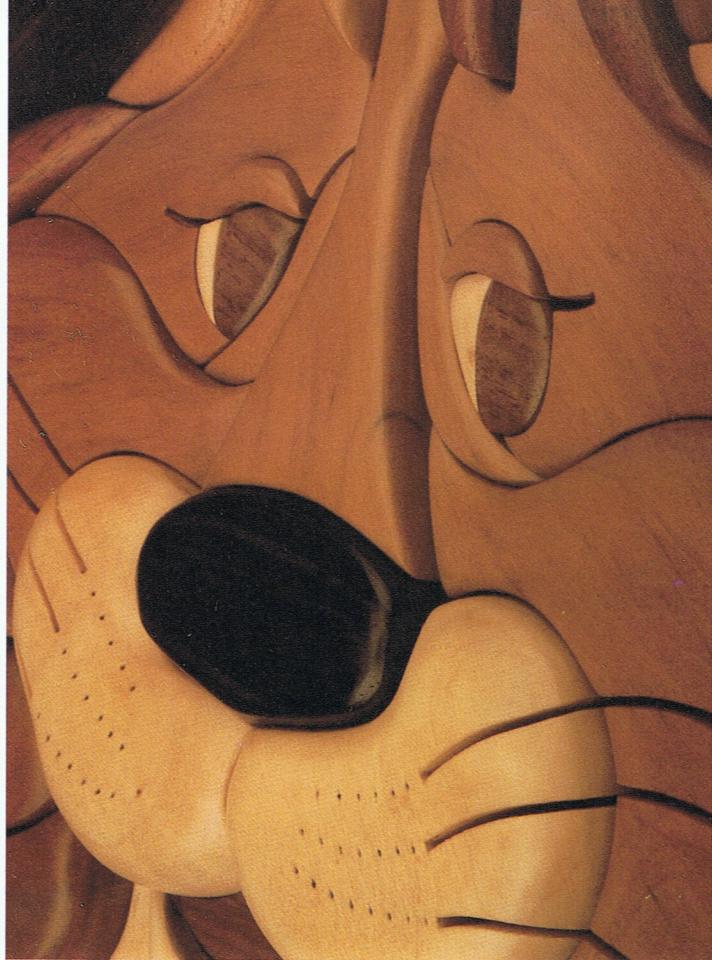
Shape the rest of the pieces, being sure not to ruin your already-established fit by shaping down too low.



Here is the face partially shaped.



As you proceed, you will see that the pieces should not be uniformly rounded. Look at the different slopes and curves in this section of a finished lion.



I just barely softened the edges and corners on the bridge-of-the-nose piece, to help it stand out distinctly. The adjacent face pieces have been shaped much more extensively, so that they slant gently down, lower than the nose. Other areas, like the muzzle pieces, need to be gently rounded to look soft and full.



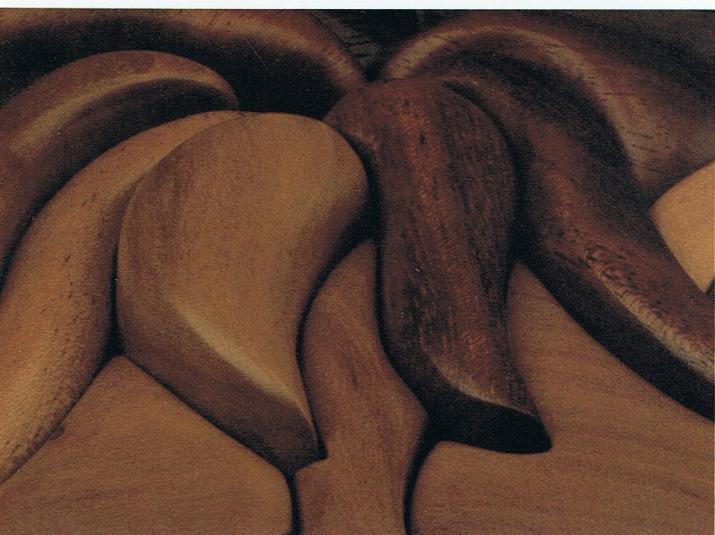
I shape the mouth and lip pieces to slant backwards under the muzzle, for a realistic detail.



Similarly, I shape the ear piece to stand tall at the outer edge, but slope it downward at the inner edge. This makes it look as if it is poking out of the mane.



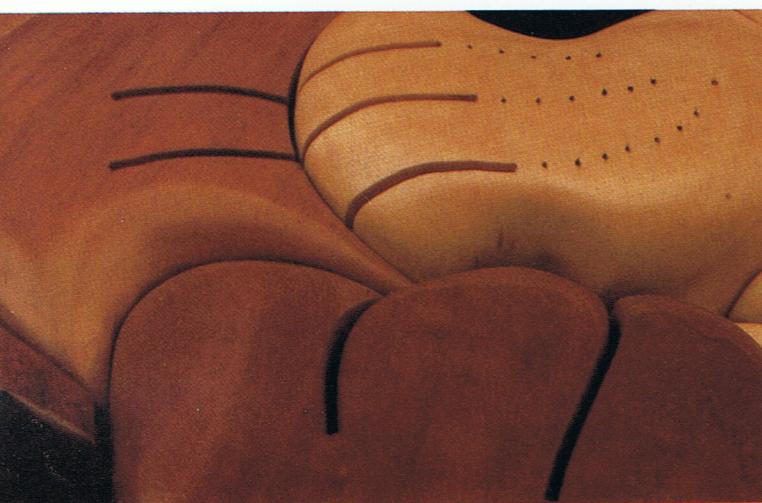
The lock falling behind the ear can be tapered downwards towards the high outer edge of the ear, too, so it looks as if the hair is tucked behind the ear. Layering like this really adds character to the lion.



Using different angles and shapes for the locks of hair in the mane gives the lion a tousled, natural look.



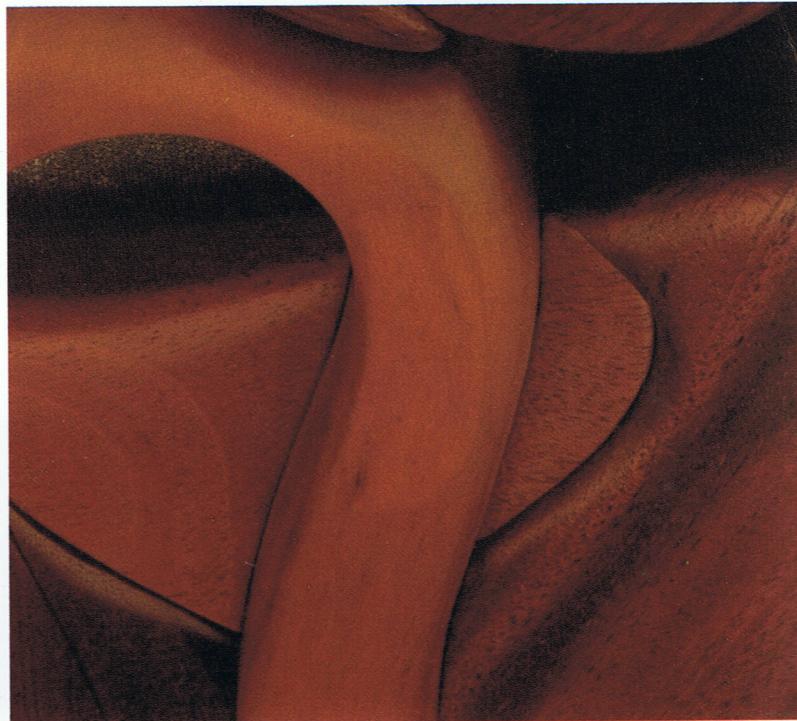
This is the elbow upon which the lion has propped himself up. Notice the realistic shaping I used here. The fleshy part of his arm (at the top left) has been gently rounded, while the elbow is shaped to poke out with barely any 'padding'. Likewise, I have left the bottom edge almost untouched, the bony edge of his forearm.



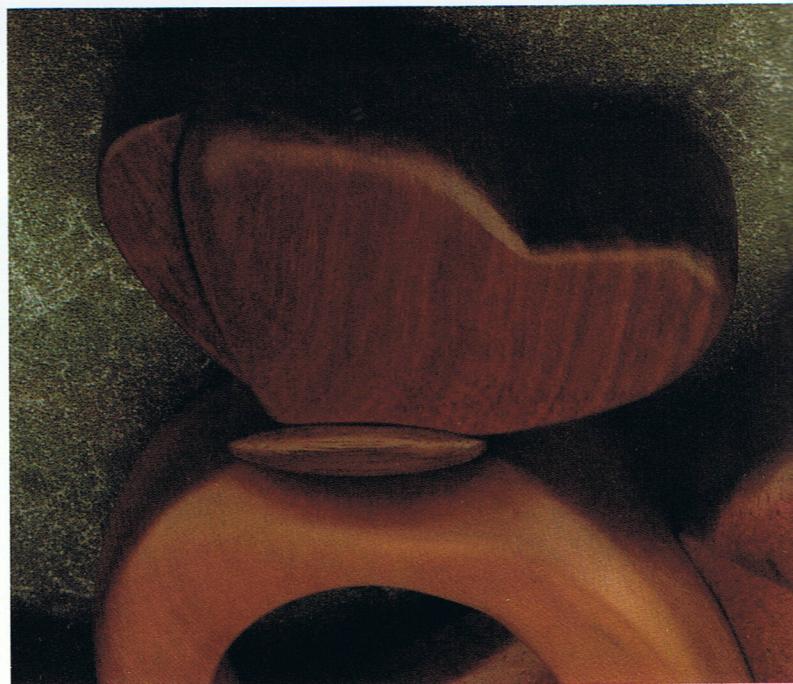
See how the paw, muzzle, and cheek seem to dimple each other where they meet. It is possible to make the wood look as if it were a soft, pliable material!



The dark wood at the bottom of this picture, part of a body piece, took a lot of work. I had to sand down a lot of the top surface to make its edge gently fall lower than the curvy mane piece above it.

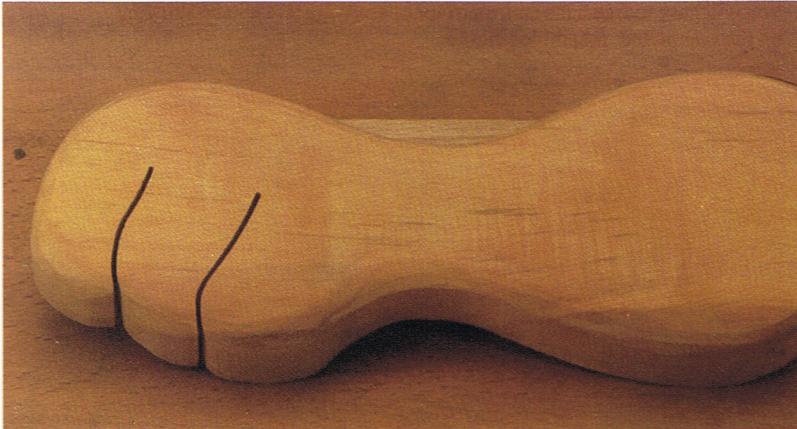


I shape the lion's hindquarters so that the tail stands out from the adjacent pieces.



This is how I shape the butterfly. If you look at a picture of my finished lion, and give some thought of your own to the depths and contours a *real* lazy lion might have, you will be able to decide how much shaping the pieces require. Keep checking them against one another, and remember that they all must work together as a unit.

The Finishing Stage



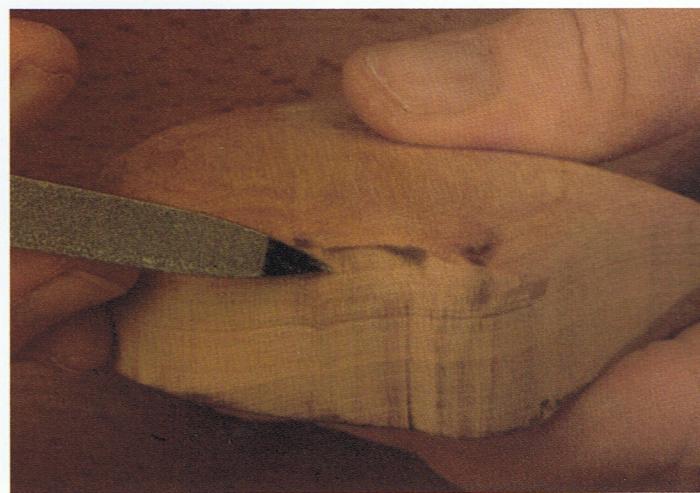
Here is a shaped forearm and paw, ready to be sanded smooth with the belt and vibrating sanders—‘finished’. Notice the rippled marks left on the top of the wood; these are planer marks from the original board, and should have been sanded out while the board was intact, before the pieces were cut out.



As you ‘finish’ the pieces, go over all surfaces again with the 220 grit belt, making sure to check under a strong light for heavy scratches from the previous 180 grit belt. Some of these ripple lines were caused by the coarse paper of the belt sander during the shaping process, and will be taken out now, during the finishing stage. Always end up working *with* the grain wherever possible. After going over all surfaces with the 220 grit belt, change to a 320 grit belt and do it again.



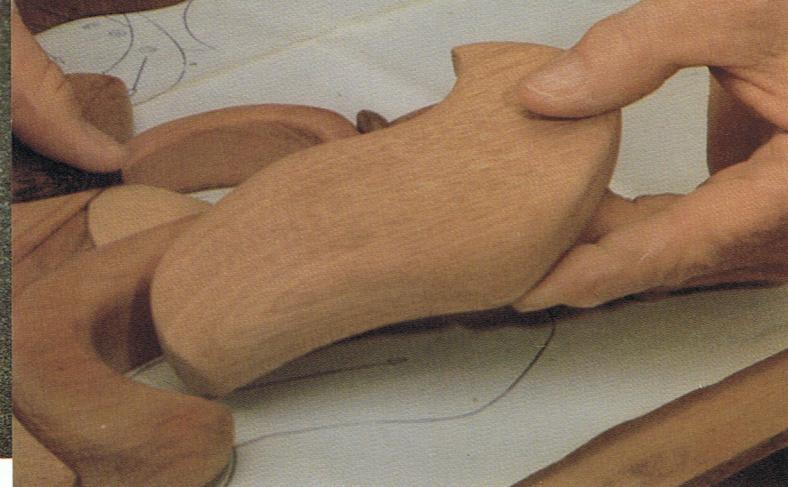
These ripple lines were made by the band saw, and were not sufficiently sanded out on the belt sander. These too will have to be taken out now. If care had been taken to be sure that all this was done initially, this stage would be much easier. Now we must backtrack, and finish the job.



These burn marks were caused by the 320 fine sanding belt. Pressure was applied too hard, and the platen was still in place, making the belt too stiff. This stage should have been ‘feathered’, that is, sanded with very light pressure. This area, too, must be smoothed out now. Be aware that some types of wood burn more easily than others.



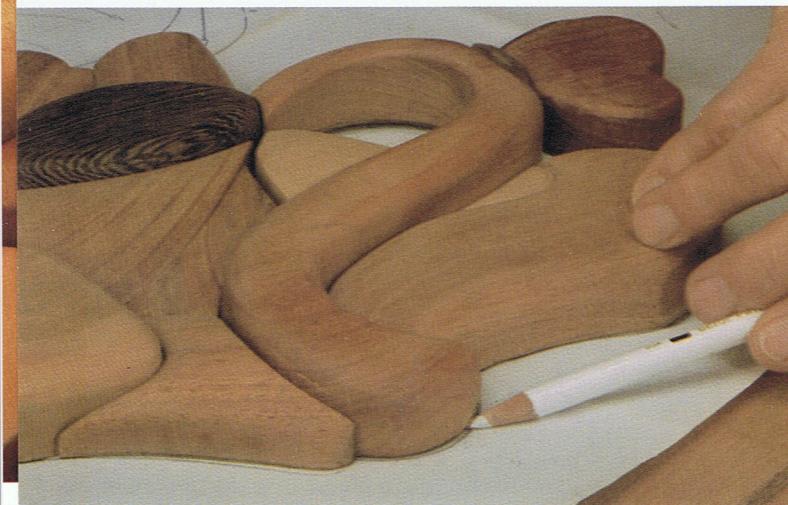
When you are finishing a piece, the vibrating sander is used first to sand the rounded part of the edge to a perfectly smooth state.



You will need to check these pieces against the pattern and against the adjacent pieces as you work, to determine how far down on the edge it is safe to finish. Soften all the edges, being careful to avoid the edge-surfaces that must fit up against one another precisely.



This part of the tail should only be finished down to this point; finishing any lower risks ruining its fit to the haunch piece beside it. Make a pencil mark to indicate how far down your finishing will go. Do this as you move on to each and every piece.



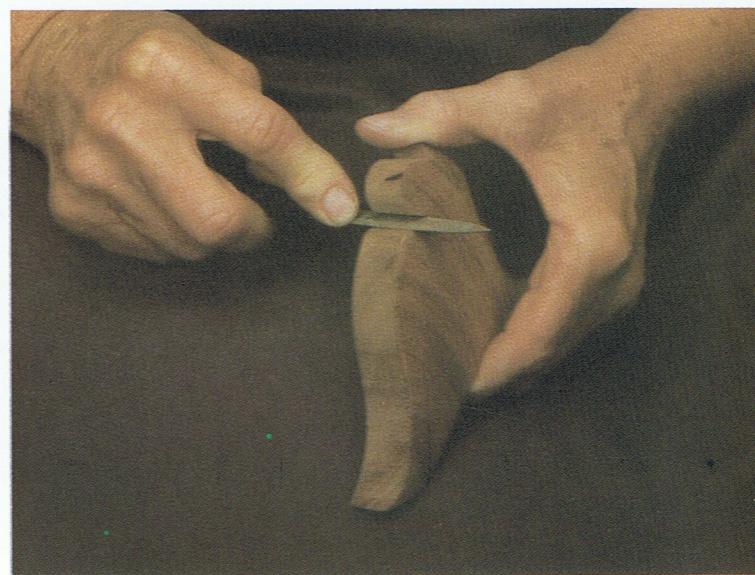
This edge of the tail piece needs to be finished from top to bottom, since it will be one of the visible, *outside* edges of the assembled lion.



You will have to finish the entire surface of any edge that will be showing on the completed, assembled figure.



After you finish the appropriate portion of the edge, sand the shaped surface, being sure to follow the grain.

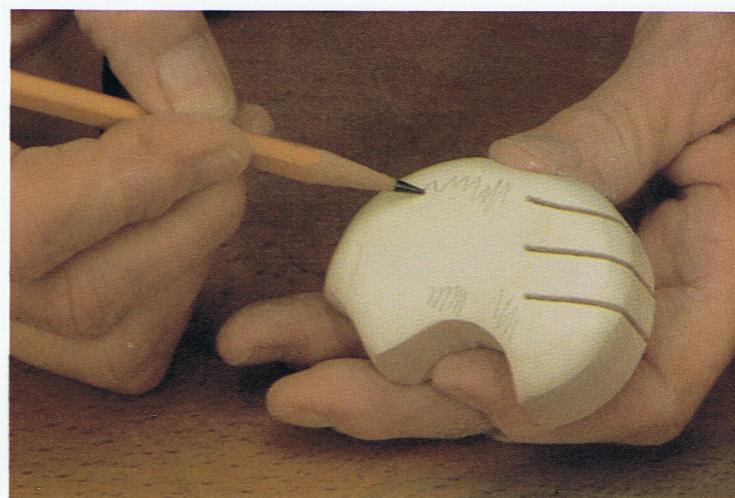
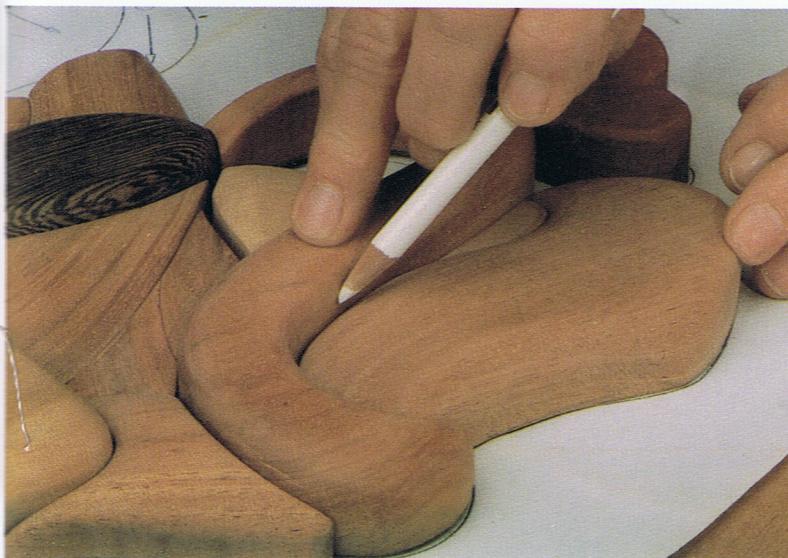


A diamond dust nail file or an emery board is useful for doing sanding on the inside of crevices and sharp angles.



If you touch up any edges, curves, or crevices, be sure to go back again, to check and finish the top surface completely with the vibrating sander.

Wiping, brushing, or vacuuming the piece will show up any scratches or imperfections that remain to be sanded out. I work under a 150-watt work lamp, and turn each piece in the light to inspect it before I decide it is completely finished. Only after the piece is completely done to my satisfaction do I go on to 'finish' the next piece.



The finishing stage can really bring out the grain.

This piece will need a little more work. I have marked all the flaws with a pencil so that I can see their locations more easily; as I sand the pencil off, most of the scratches should disappear too.



When you are done finishing your pieces with the vibrating sander and any hand-sanding, clean off the dust with a soft brush or a tack cloth, or vacuum it off. Some people use a blower, but I have found that this can send dust and tiny splinters into your skin.

After you have finished your pieces with the vibrating sander, it is time to put the final touches on, sanding by hand. First I check the edges. Remember: move the sander in the direction of the grain!



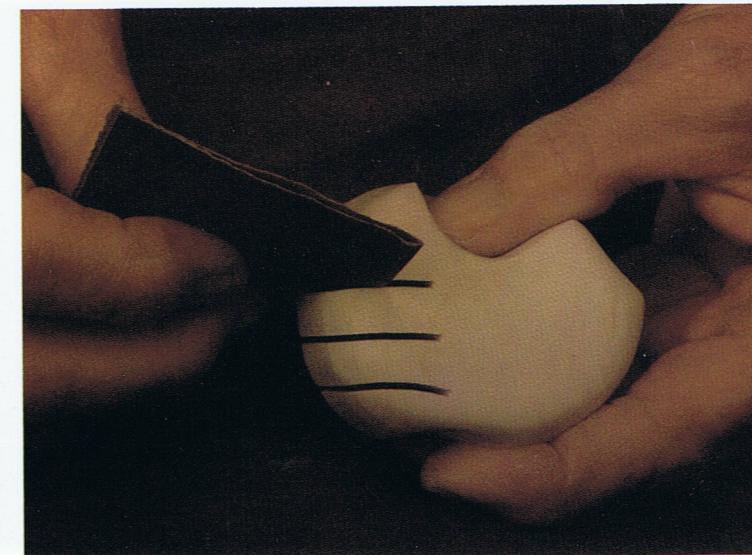
Round the paper down over the edges.



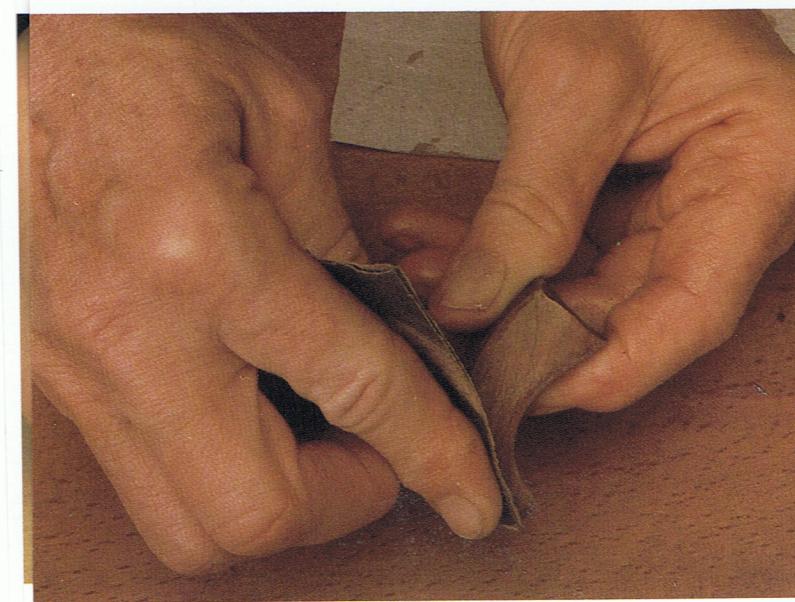
When the edges are done you can sand the surface down, being careful to go in the direction of the grain.



If your edge is not a smooth curve, you will have to sand it down.



You should lightly run the sandpaper through any cut lines, like the whiskers in this piece. For the most part, I do this simply to get any sawdust out of them.



Hand sanding gives you a measure of control that the vibrating sander does not.



Hand sand all the rest of your pieces. Brush them, vacuum them, or wipe them down with tack cloth. I usually use a small vacuum as my last step. Now the pieces are ready to be arranged on a backboard, and then varnished.

Making the Backboard



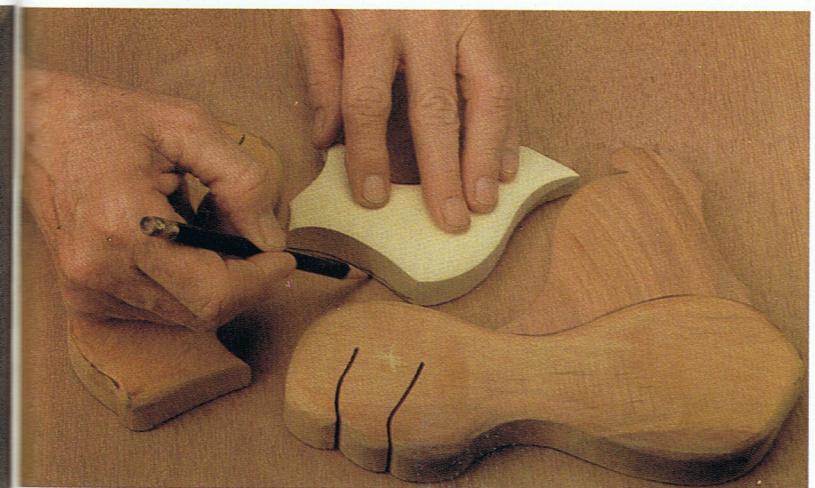
Lay out the rest of the pieces carefully.



To assemble your lion, you will need to make a plywood backboard in the proper shape. First, lay out all of your fitted and sized pieces on a piece of 1/4" plywood. This piece (#40 on the pattern) is the center piece, the most important piece for your arrangement; it roots all of the others, which can be laid securely around it.



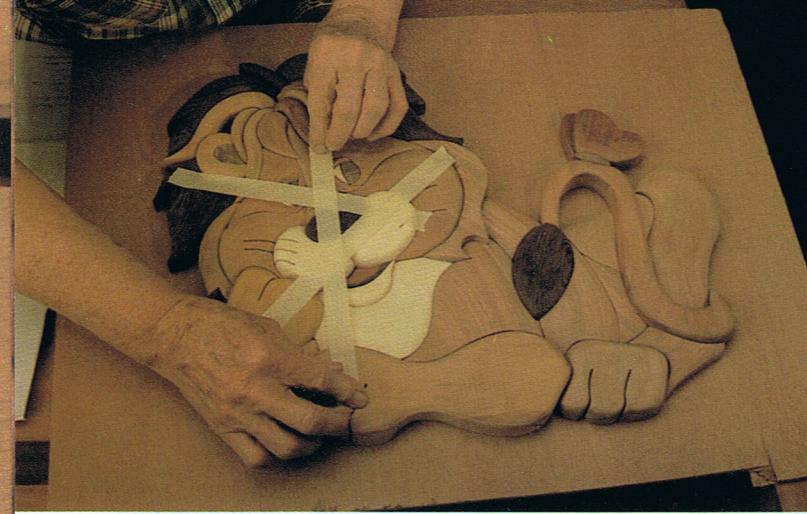
As you go, check again that each piece fits snugly and precisely. Be aware that the whole 'puzzle' will shift as you add new pieces to the board. See how the lion's hindquarters have gotten misaligned?



Start your arrangement on the backboard by taping the center piece (#40) securely to the board using a small piece of double-sided carpet tape. Then trace around it. Later, this outline will show you precisely how to center your arrangement.



Before you trace around the figure, make sure that you have left no gaps between pieces.



Since this is a large piece, and difficult to hold together, you may want to tape the units together.



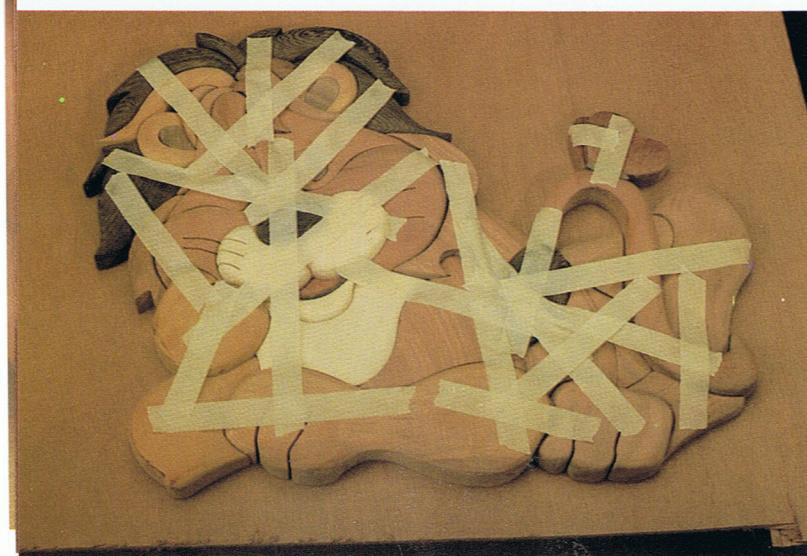
Trace around the figure firmly with a pencil, making sure that the pieces do not shift. You may want someone else to help you hold them down as you trace.



This will prevent the pieces from shifting too much from their places as you run your pencil around the outside border.



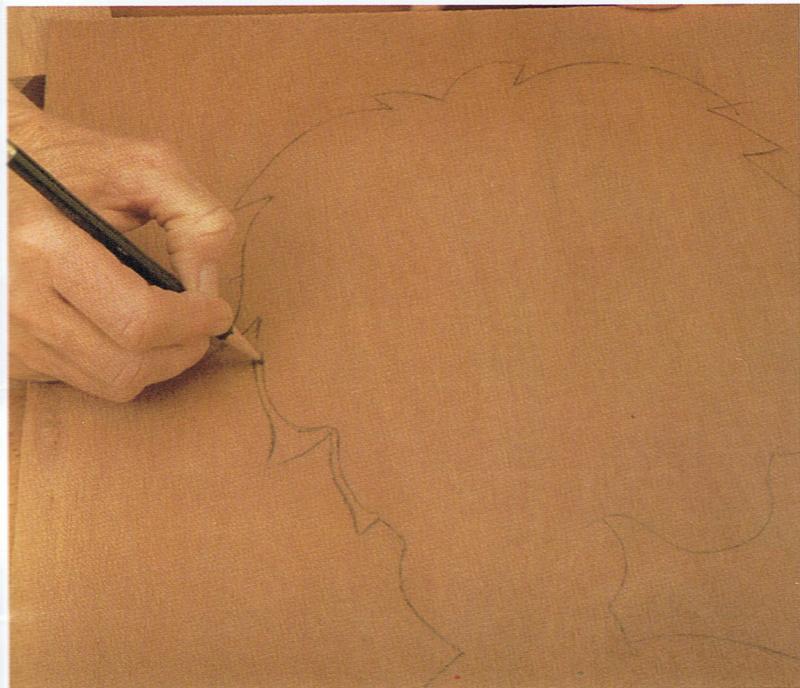
Now you can remove all of the pieces, including the taped-down centerpiece. Check all the edges for pencil marks, and erase any you find.



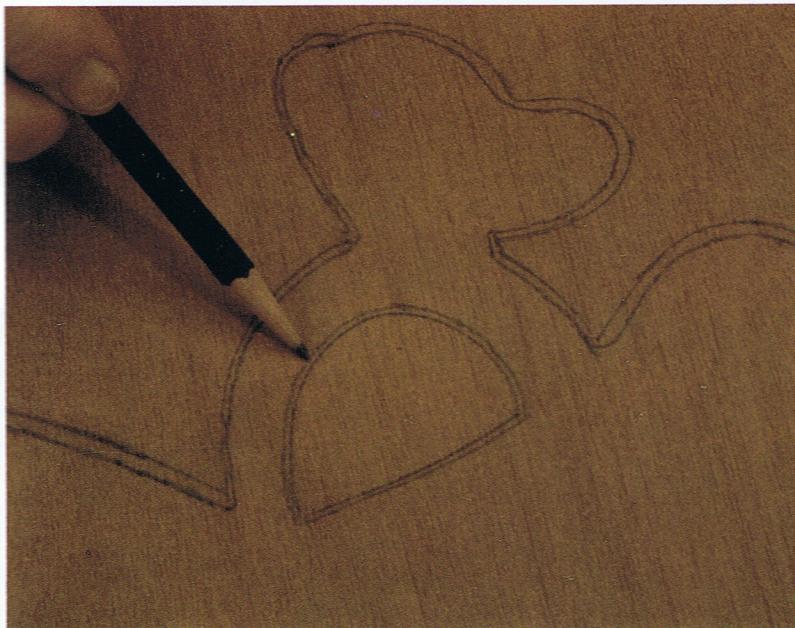
It might even hold a real lion!



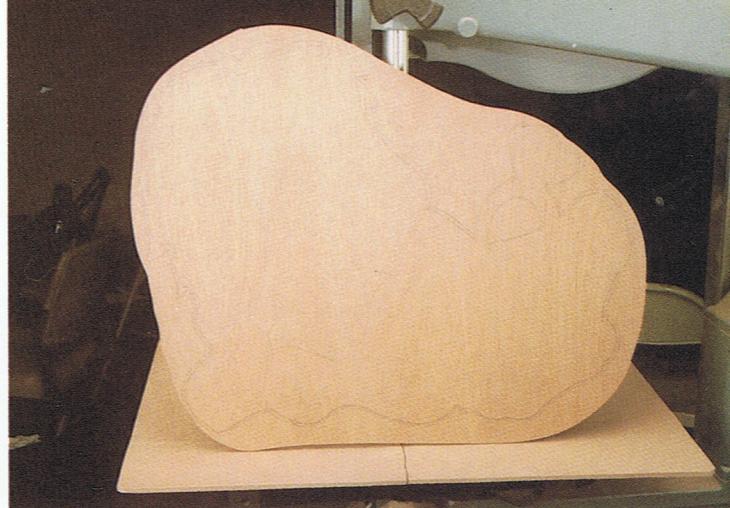
Here is the outline you have created. The smaller outline of the center piece is in the middle.



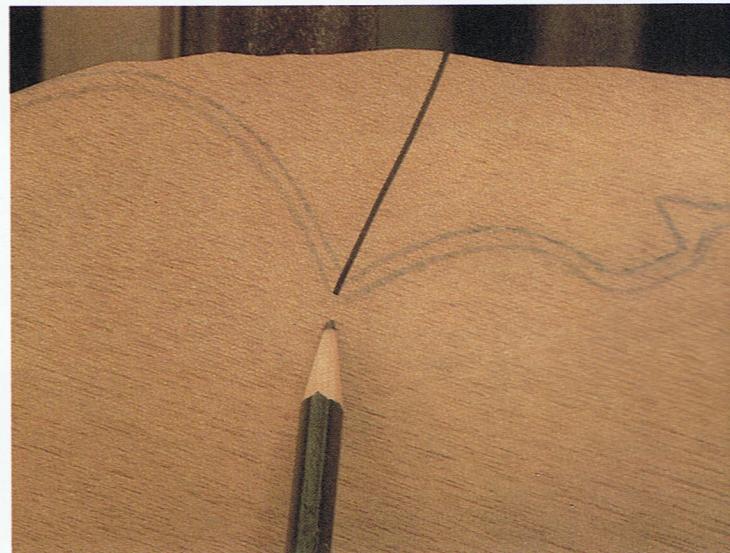
The backboard must be slightly smaller than the actual figure itself, or else the edges of the finished piece will seem sloppy when seen from a slight angle. Here I am drawing a new line about $1/8$ " in from the actual borders of the lion. Because the pieces in the mane are long and solidly rooted, they will not need support at their tips. Notice that I have "cut them off" on this new outline.



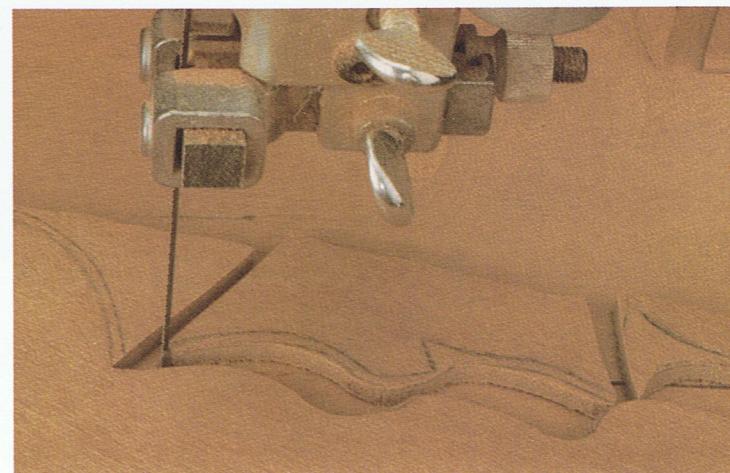
Even on the narrow tail portion, there is room to come in $1/16$ " on both sides. It is important that you pencil in these new lines all around your figure; if you try to cut without these lines, you will find that you come in too much in some spots, too little in others.



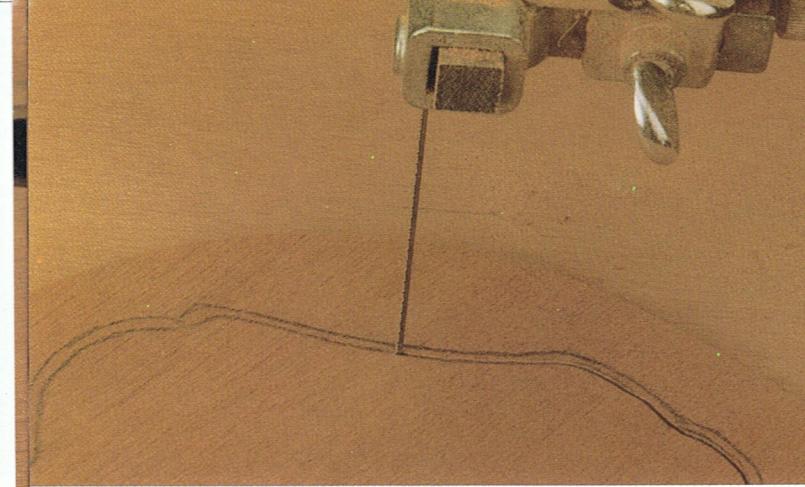
Using a $1/8$ " blade, I have cut off the excess parts of the board so that the large backboard will be easier to work with on the band saw. You could use a jig saw to do this part of the project as well.



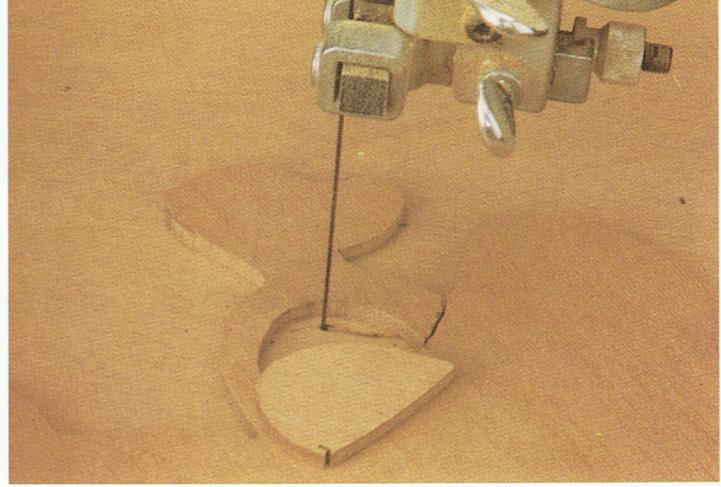
It is awkward to cut the edges off in one single piece — like trying to peel an apple in just one curly strip. Especially when there are sharp concave corners to be trimmed out, incisions like this one can be helpful. I make short cuts like this one into many of the angles of the pattern.



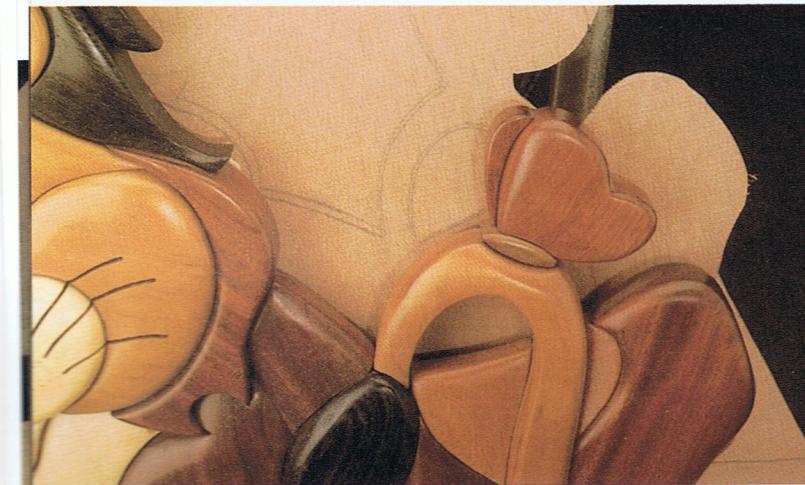
Then, as I cut around the outline, small segments of excess wood fall away. This gives the blade enough room to turn corners cleanly.



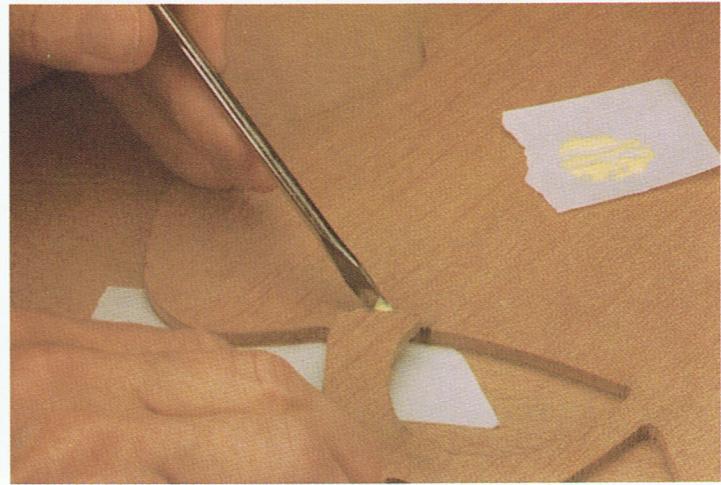
Here, the band saw's arm is raised to show you that I am following the *inside* line with my blade, so that the backboard will be somewhat smaller than the pattern itself.



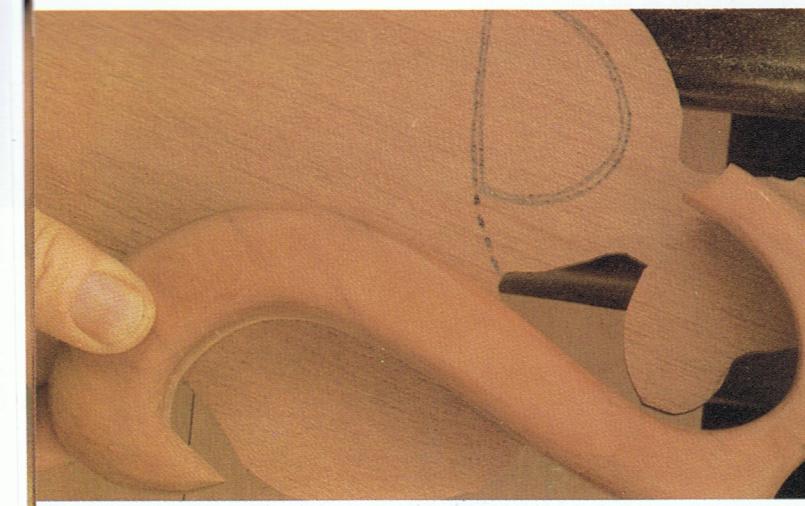
This way, the backboard will provide support at a weak area in the intarsia "puzzle pieces," while the puzzle piece will provide support for the weak, cut area of the backboard



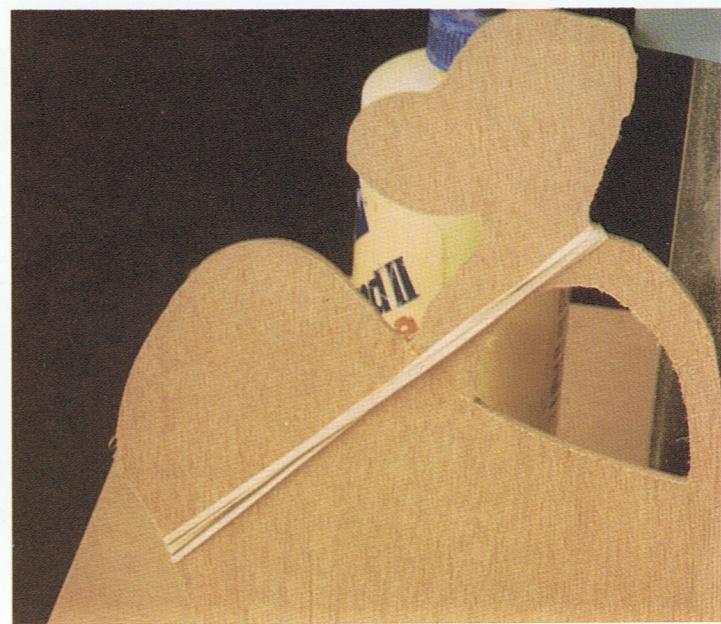
Because of the arching loop of the lion's tail, this backboard will have a hollow cut-out section. If I were working with a scroll saw, this would be easy to handle; I could insert my blade in the space to be removed, and cut it out.



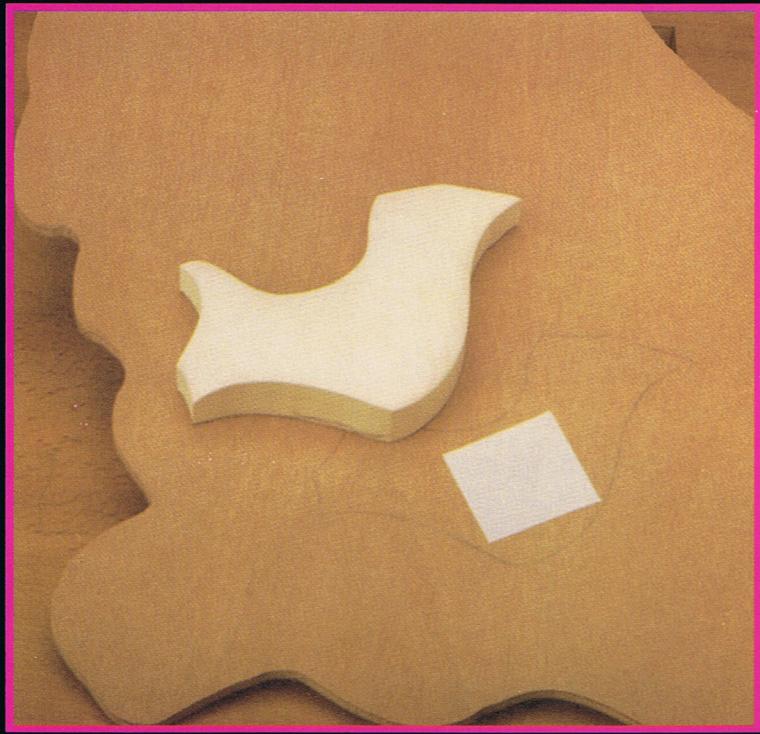
A touch of Titebond II glue won't hurt, though, to seal the cut. I suggest protecting your table surface with wax paper before you glue.



With the band saw, however, I will need to cut through one side of the tail's arch (along the dotted line) to reach the outlined cut-out portion. I decided to make the cut on the right side of the loop rather than on the left, so that the break in the backboard does not correspond with the end of the tailpiece.



Use a rubber band to hold the edges together tightly while the glue dries.



Again, lay the pieces out on the backboard (without glue) to make sure they fit properly. I plant the center piece in position, as indicated by the tracing I did earlier. A square of double-sided carpet tape holds it in place.



Here you can see the three main units I have concentrated on shaping and fitting throughout the project.



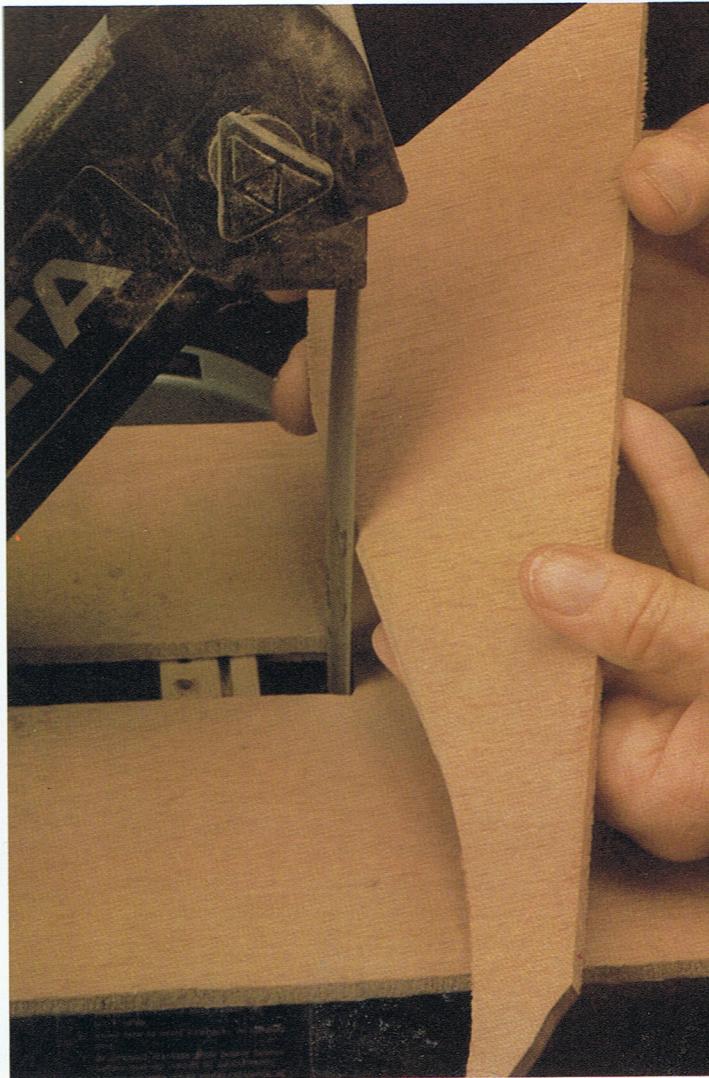
Lay the rest of the pieces in place around it.



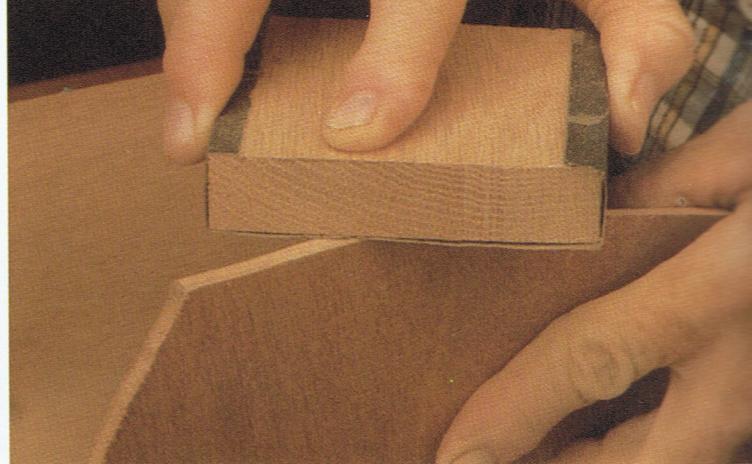
For the most part, the edges of the backboard are tucked neatly underneath the intarsia pieces.



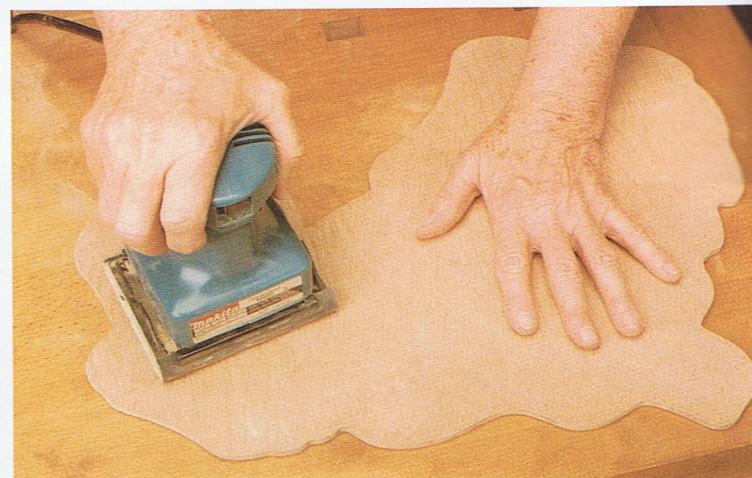
However, I do notice that the butterfly does not fit well on the backboard; I will cut the backboard down to fit it.



Once I am confident that the pieces and the backboard are a tidy fit, I can round the backboard edges with a band sander (or by hand or with a rasp) for a finished look.



Even if you choose to leave the edges square, be sure to smooth them with a block sander or a Moto tool. If you neglect to do this, you could get splinters — or worse, have a messy-looking back.

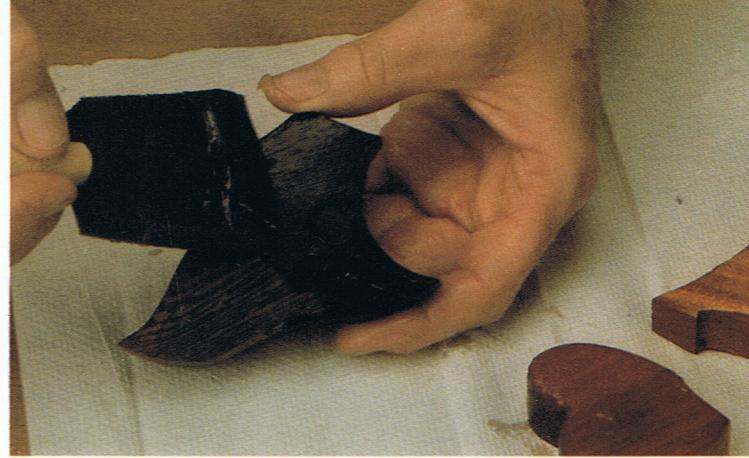


You should also be sure to sand the back of the board; customers have a tendency to check out the backs of pieces!



To give the backboard a professional-looking finish, cover the edges and the back with black spray paint. When you spray the edges, shoot them at an angle so that you get as little paint as possible on the gluing surface. After this dries, the backboard will be ready to use.

Varnishing



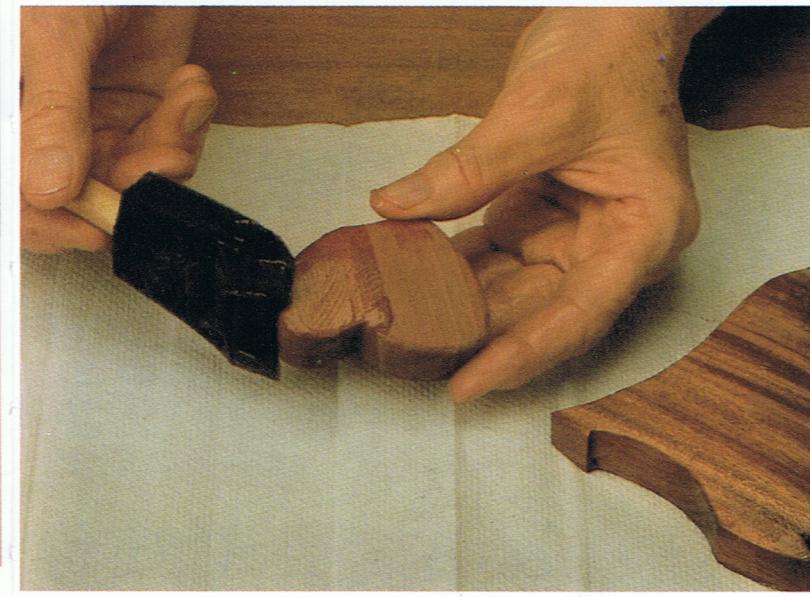
Since varnish starts to harden quickly, it is important to wipe off the excess without too much of a delay. Because of this, I like to work in batches of three or four pieces; after varnishing the batch, I pick up a clean cloth or paper towel and wipe them off.



Once your piece is completely sanded and has been wiped clean of all dust and residue, it is time to varnish. I use a gel varnish, applying it with a sponge brush or a soft, pure cotton cloth.



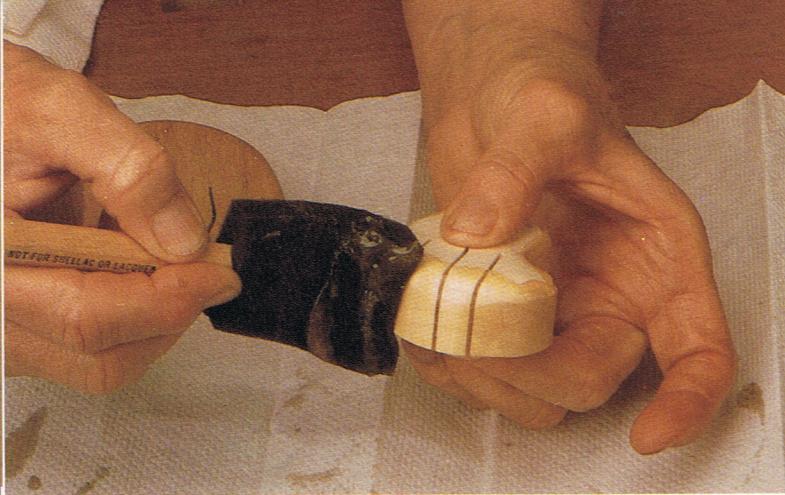
Wipe the sides first. If the varnish has already gotten too hard, swipe another layer over it, and let it sit for just a few seconds before wiping it again — the fresh varnish softens the previous layer enough to let you wipe it smooth.



As you varnish, try not to let too much spill over onto the bottom of the piece. Any varnish on the bottom will prevent the glue from holding the piece onto your backboard, so it will have to be sanded off.



After wiping the sides of a piece, wipe the top and edge surfaces, always with a caressing motion in the direction of the grain. Check the bottom to make sure there is no excess varnish.



When you are working with the paw or whisker pieces, be sure to get plenty of varnish into the crevices. Work it in from the sides...



and from the top too.



Be generous with the varnish. See how thickly I have spread it here. As you apply varnish to these pieces, imperfections may show up that were hard to see on the naked wood. If you notice any flaws, take whatever means necessary to fix it. Remember to wipe these pieces down with a tack cloth after sanding, before applying the next coat of varnish.



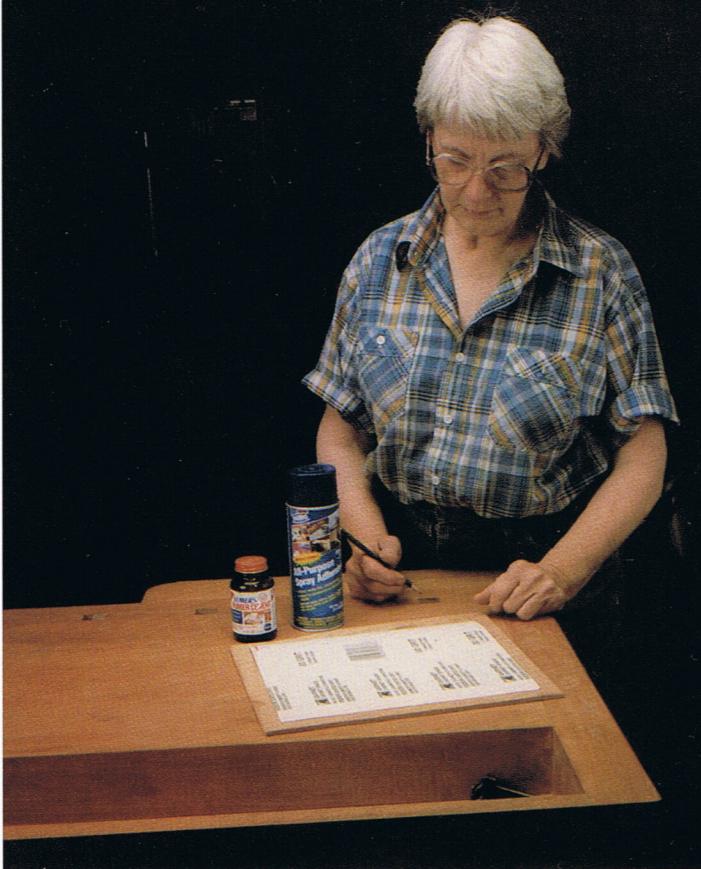
Follow the directions on your can of varnish to apply 4 to 6 coats, lightly sanding with 400 to 600 grit paper between each layer. Each additional layer will give your wood a deeper glow and greater depth. Again, don't forget to use a tack cloth before re-varnishing.



Use a folded paper towel to clear excess varnish out from the crevices.



Invariably, some varnish will get on the back of the pieces. This will interfere with gluing them to the backboard, so it must be removed.



To do this, I will make a special sandpaper board, using a piece of sandpaper, a piece of board, and rubber cement or spray adhesive.



and lay it down. Let it dry.



I spread the back of the paper with glue (or spray it with adhesive according to the directions on the can)...

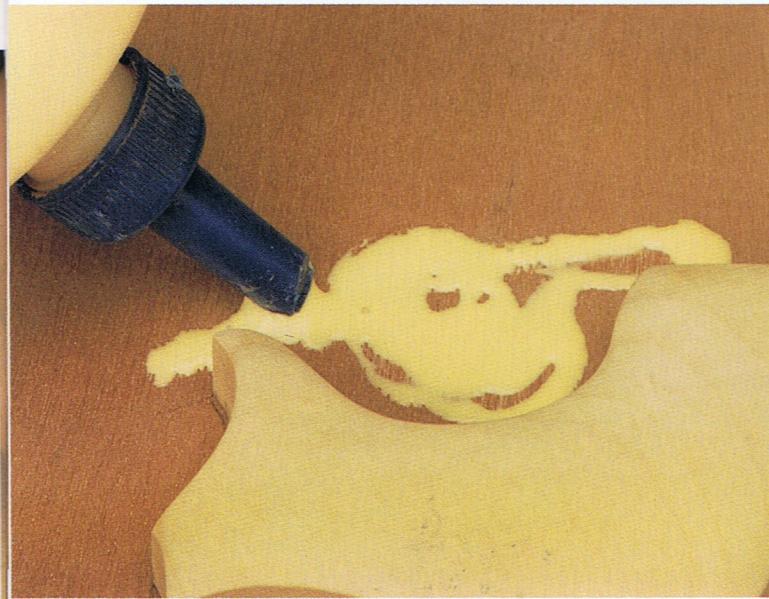


Rub the bottom of each piece against this board to remove any varnish that made its way onto the bottoms of your pieces. After you've cleaned them all this way, you can begin to lay the pieces down on your backboard.

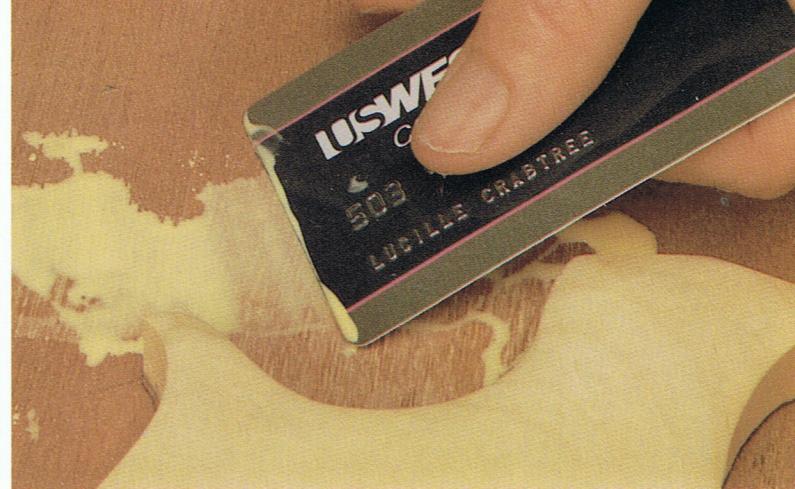
Laying Out the Lion



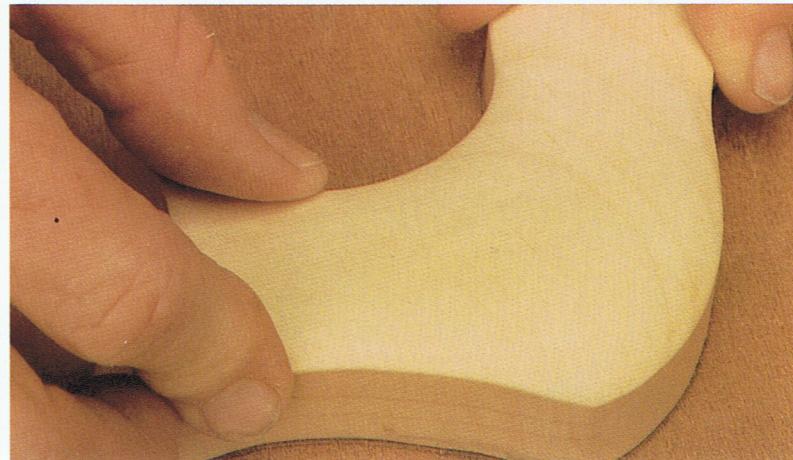
When all the pieces are varnished, and their backs are clean, it is finally time to glue them in place on the backboard.



Begin with the center piece (#40), gluing it precisely into the outlined space you drew earlier. Use a good amount of Titebond II fast-sealing glue. If you get glue on a piece where it shouldn't be, use a damp cloth to wipe it down.



I like to spread the glue smooth with a flat plastic spatula; or, in a pinch, a credit card! If the glue is too thick, or uneven, it can ruin the fit of your pieces, so be careful.



It is crucial that you settle this piece exactly within the penciled outline. The alignment of the entire project relies on this piece's correct location. Once this piece is in place, I switch to a slower-drying glue, either Elmer's Carpenter Glue or regular Titebond.



Once the glue between the center piece and the backboard has bonded, you can begin to glue down the rest of the pieces. Don't forget the lift beneath the muzzle.



Here I am working on the face unit.



I leave the eyes out until the end, since they have to fit inside an enclosed space.



After I settle the haunches in, the body is done.



Work the pieces together tightly. The glue should give you enough time to maneuver them into proper position before it bonds.



The eyes and eyelids, which I hold together firmly and insert as a unit, settle right into place. You can give the eyelid a 'lift' by gluing the unit together (using Epoxy) with the eyelid piece raised, as I showed you earlier. Another way to accomplish this is to glue a tiny wood scrap or a piece of broken toothpick on the bottom of the eyelid, and then place the piece into its socket.

The Gallery

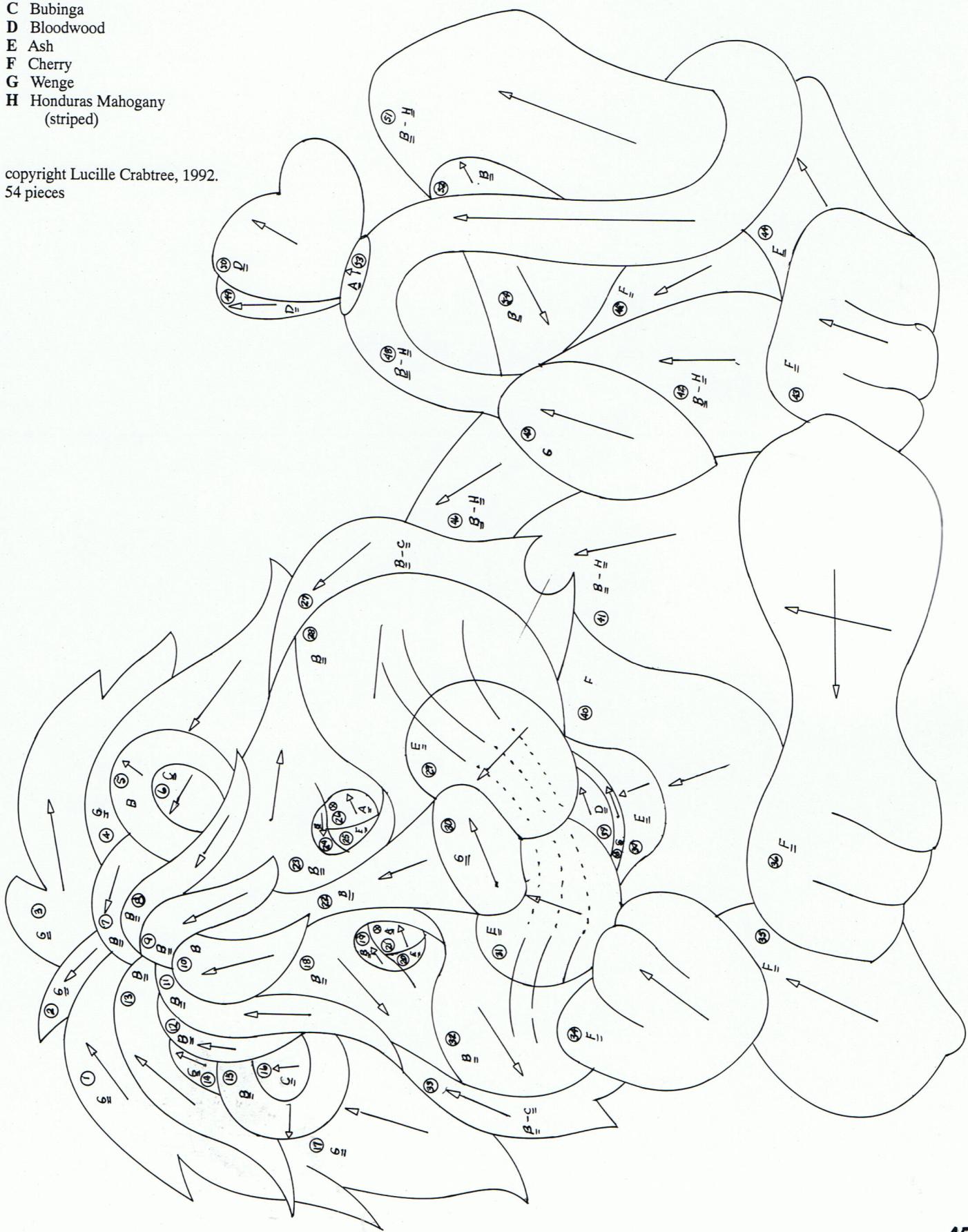


Here is your finished lion! After the glue is dry you can attach a picture-hanging mount, and your piece is ready to display!

O Lazy Day

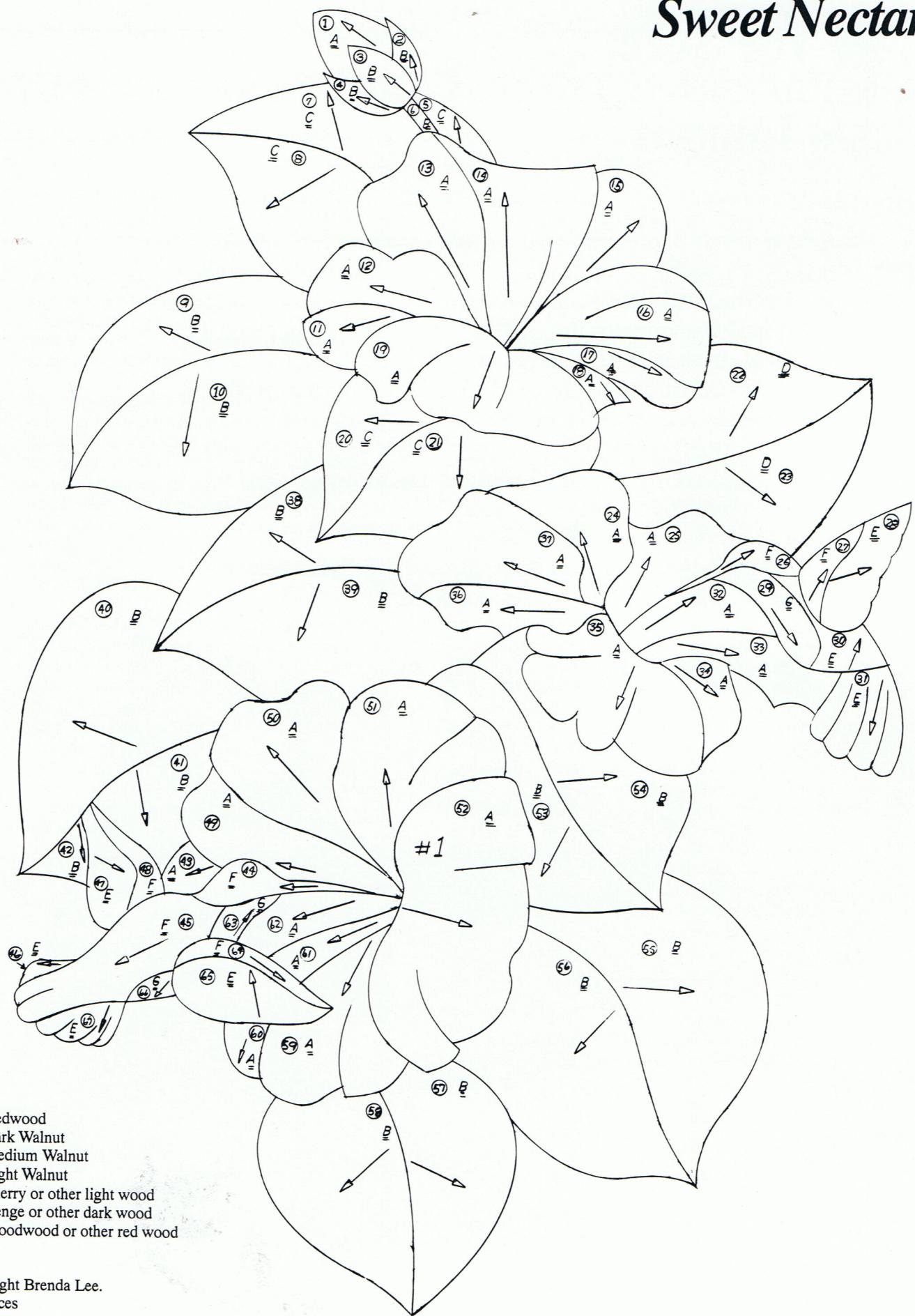
- A Dark Walnut
- B Penroba Rosa
- C Bubinga
- D Bloodwood
- E Ash
- F Cherry
- G Wenge
- H Honduras Mahogany (striped)

copyright Lucille Crabtree, 1992.
54 pieces





Sweet Nectar



copyright Brenda Lee.
67 pieces

Have You Seen. . . .

Basic Intarsia

Intarsia is a craft of precision and artistry. A picture is created by cutting out and then fitting together many pieces of differently colored and textured woods, much like a jigsaw puzzle. These pieces are then rounded and shaped individually, to create realistic contours and lend a three-dimensional effect. When the pieces are varnished, fitted together, and glued onto a backboard, they make a beautifully polished, professional-looking piece.

Step-by-step, this book shows you how to make an intarsia teddy bear wall hanging, perfect for a child's bedroom. The project is ideal for someone just starting to learn the art of intarsia, teaching basic techniques (from selecting your wood to hanging your finished piece) and showing how to deal with common difficulties and pitfalls. Also included are patterns for a girl teddy bear and a dinosaur.

from Schiffer Publishing

