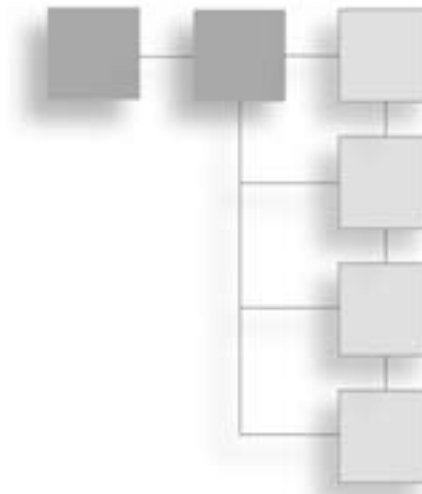# CHAPTER 9

SKINS

S kins are special textures used in games. The quality that separates skins from regular textures is that they typically wrap around the shape of a 3D model. It is fairly obvious that 3D monsters and player-characters would have texture skins, but the term can also apply to automobiles, wheelbarrows, mailboxes, rowboats, weapons, and other objects that appear in a 3D game.

Typically, skins are created after a model has been unwrapped, so that the skin artist knows how to lay the skins out in the UV template. We're going to do the process a bit backward, simply because we should stay on topic with Paint Shop Pro and textures until we've covered the topic sufficiently.

In our case here, it isn't a big issue anyway, because I'm providing you with UV templates from previously UV unwrapped models to work with.

UV Unwrapping

UV unwrapping is a necessary function prior to skinning a model. Consider it part of the *modeling* process in the context of this book. However, in this chapter we'll deal with the *texture* processing part of skinning a model and use models I've provided on the CD. Later you'll create and skin your own models and do the unwrapping and other things. We'll cover how the unwrapping works in more detail then.

When we want to apply textures to 3D objects, we need a system that specifies where each part of a texture will appear on which parts of a model. The system is called *U-V Coordinate Mapping*. The U-coordinate and the V-coordinate are analogous to the X- and Y-coordinates of a 2D coordinate system, though they're obviously not exactly the same.

Imagine (or you can actually try this at home yourself) taking a closed cardboard box and slicing it open along the edges. Then lay the whole thing out flat on the kitchen table, with no parts overlapping parts. There, you've unwrapped your box. Now get out your crayons and draw some nifty pictures on it. Then glue it all back together again to make a box. I think you get the idea.

With UV unwrapping we apply the technique to some complex and irregular shapes, like monsters and ice cream cones.

The Skin Creation Process

When we begin the skinning process, we will have a bare, unadorned 3D model of some kind. For this little demonstration, we'll use a simple soup can (see Figure 9.1). It's a 12-sided cylinder with a closed top and bottom (end caps). Each side face is made up of two triangles, and the end caps are made of 12 triangles each, for a total of 48 triangles. Nothing too special here.
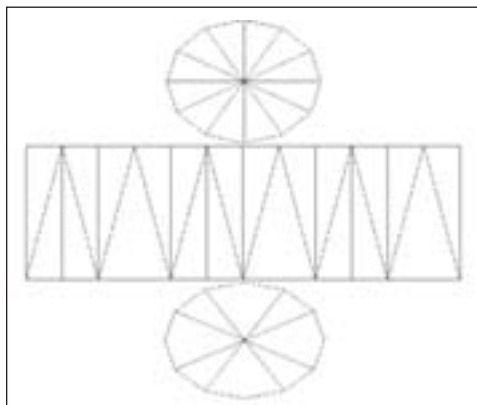
Using the UV Unwrapping tool, we have to basically spread all our faces out over a nominally flat surface (see Figure 9.2).

We save the image of the UV template, plus we save the original model file, because the UV Unwrapping tool will have modified the UV coordinates for the objects in the model, and we can save those changes to the file so that the modeling tool can read them back in again.

Then we import the unwrapped image with the lines indicating the face edges into an image processing tool like Paint Shop Pro and apply whatever textures, colors, or symbols we need, such as shown in Figure 9.3.

Figure 9.1 The victim—a simple can of soup.

Notice that for textures I simply created markings and re-created a simple label. For the top of the can I made some circular text, and for both end caps I made a circular pattern that represents the ridges you often find in those places on tin cans. The image file has now officially become a skin for the can!

The final step is to import the new skin into the modeling program (or the game) and view the results, as in Figure 9.4.

The part of the process we will focus on in this chapter is the activity shown in Figure 9.3, the actual creation of the textures on the UV

Figure 9.2 Laying it all out—the unwrapped can.

template, so that it can be later used as a skin for models.

Making a Soup Can Skin

So let's dive right in and create a skin. We can use the bare model of the soup can I showed you in the last section. The procedure has quite a few steps—more than 30—so we'd better roll up our sleeves and get to it.
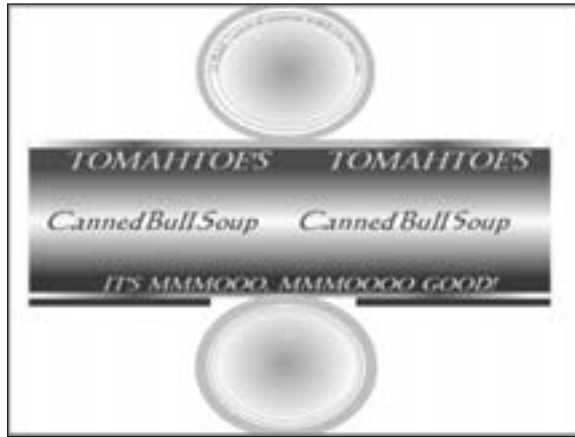
Figure 9.3 After applying textures.

The Soup Can Skinning Procedure

This is how you skin a soup can:

1. Open C:\3DGPAi1\resources\ch9\can.bmp in Paint Shop Pro. This file contains the UV mapping template.

Figure 9.4 Aha! Not such a simple can anymore. Nutritious, too!

tip

Remember when I said that the only file types we would need to use are JPG and PNG in the last chapter? Well, that was sort of a lie, though not quite—you see, the only file types we will be using for *making games* will be those two types. However, the UVMapper program outputs its UV mapping templates as one of two types: BMP (Windows bitmap) or TGA (Targa) format. So I've picked BMP to be our standard UV mapping template format. We won't be creating any game files in this format, however.

2. Choose Image, Increase Color Depth, 16 Million Colors. You need to do this to get access to the full palette.

3. Save the file as C:\3DGPAi1\resources\ch9\mycan.psp. This way you can re-use the layers over and over at later times if necessary. Make sure you save your work often as you follow the steps, in case you royally mess up, like I frequently do.

4. Right-click the Layer palette (see Figure 9.5), and then choose New Raster Layer.

5. Accept the default settings and click OK.

6. Click Raster 1 to make that layer active.

7. Click the Preset Shape tool, third icon from the bottom of the Tools toolbar on the left.
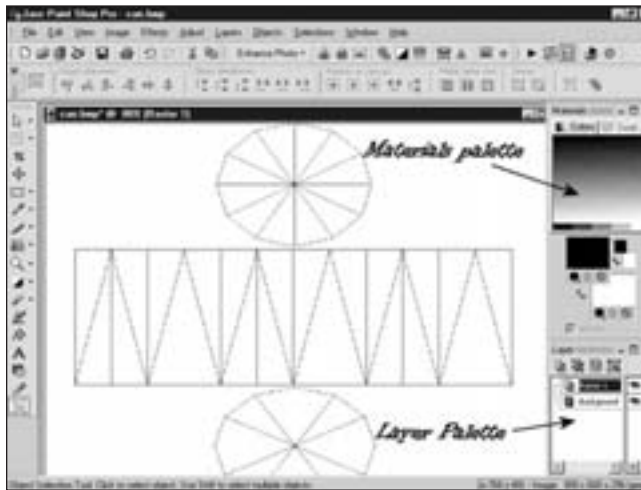
Figure 9.5 Materials and Layer palettes.
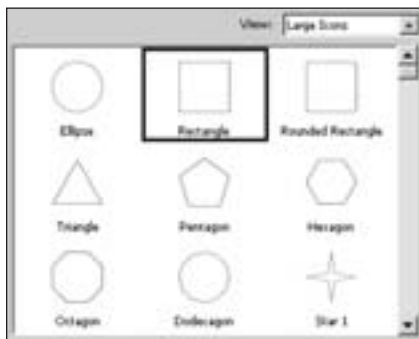
Figure 9.6 The Shapes List.

8. In the Tool Options palette (if it is not visible, choose View, Palettes, Tool Options to make it visible), click the Shapes List icon. The Shapes List will appear, as in Figure 9.6.

9. Choose the Rectangle from the Shapes List control; the list will go away automatically.

10. If the Create As Vector box on the Tool Options palette is checked, clear it.

11. If the Retain Style box on the Tool Options palette is checked, clear it.

12. In the Materials palette, locate the Foreground and Stroke Properties control. It is the upper-left box in the larger pair of boxes in the Materials palette.

13. Along the bottom of the Foreground and Stroke Properties are three buttons. Click the one on the far right with the No Entry icon, called Transparent. Now that it is depressed, the foreground or stroke of the object you draw will be transparent.

14. Click the Background and Fill Properties control, the lower-right control of the larger pair of boxes in the Materials palette. When the Color dialog box opens, select a bright red, and make sure it appears in the box marked Current. Then click OK to close the dialog box.

15. Now draw a rectangle that completely covers the rectangle containing the triangles in the middle of your mycan.psp image, as in Figure 9.7.

16. Now use the Background and Fill Properties control to set the fill to white, and draw a thin white rectangle across the middle of the red rectangle you just made (see Figure 9.8).

So now you have your basic red-and-white pattern on the sides of the can. If you look at Figure 9.3 again, you'll notice that the red blends into the white gradually. There are several ways to do this. For example, you could have used a gradient fill

in the rectangles you created. But you're going to use another method, one that is more of a touchup technique.

17. First, you're going to select the sides of the can. Use the Square Selection tool (fifth icon down on the Tools toolbar) to select the entire rectangle that encloses all of the red and white rectangles you've just made, but only those areas. Use Figure 9.9 as a guide.

18. Next, soften the transition between the red and the white. Choose Adjust, Softness, Soft Focus. You will get the Soft Focus dialog box, as shown in Figure 9.10.

19. Set all of the values in the boxes to 100 percent, except for Halo size. Set Halo size to 70 percent, and then click OK to close the box. You'll see the edges between the red and the white go blurry.

20. Repeat the last two steps—choose Adjust, Softness, Soft Focus, and then make sure all values are set to 100 percent (except Halo Size, which is set to 70 percent) and close the dialog box. There now—you have your blended pattern.

21. Next you'll want to add metal lips to the top and bottom of the can sides. Do this by creating a thin light gray rectangle all the way across the top and another at the bottom, as shown in Figure 9.11. The black arrows indicate the location of the lip line.

22. Now you'll want to create the surface texture for the ends, or lids, of the can. Once again, select the Preset Shape tool.

23. In the Tool Options palette, click on the Shapes List icon.

24. Choose the Ellipse from the Shapes List control.

25. This time make sure that the Create as vector box is checked.
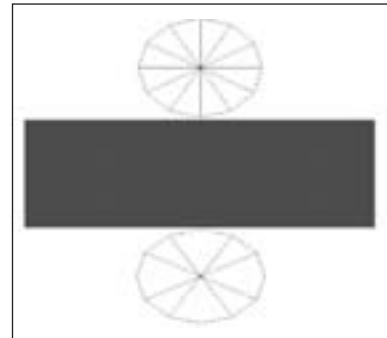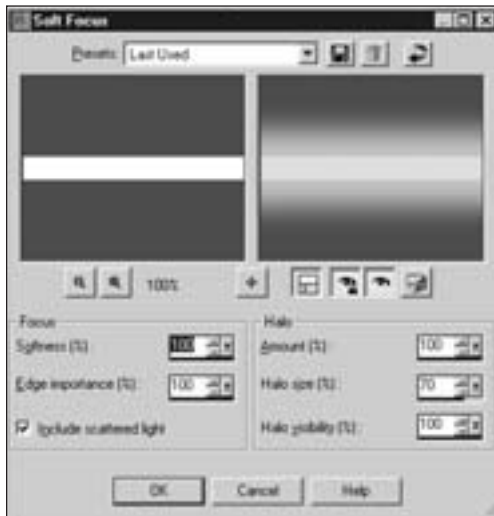

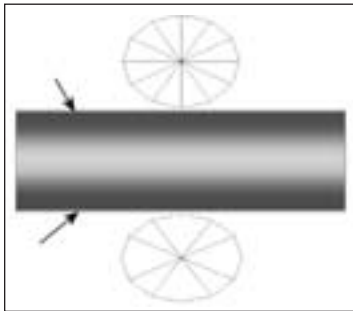**Figure 9.7** The red rectangle.
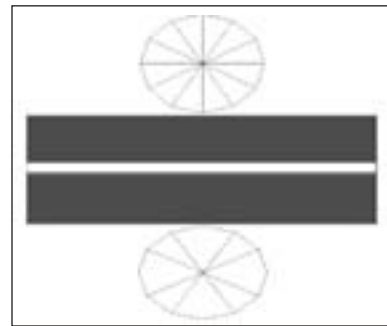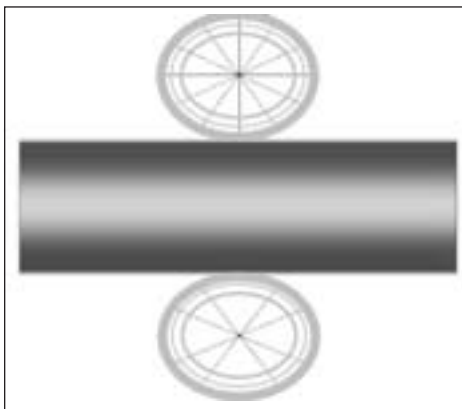

Figure 9.8 The white rectangle.
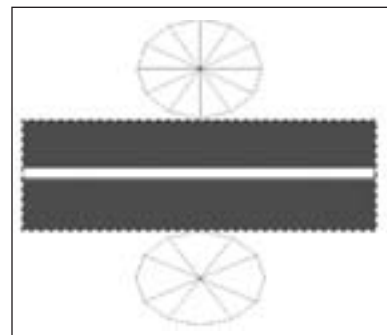
Figure 9.9 Selecting the mapped sides of the can.

Figure 9.10 Soft Focus dialog box.

Figure 9.11 Adding the metal lips.

Figure 9.12 Adding the ridges.

26. Set the foreground color to a light gray and the background color to transparent, using the same technique you used when drawing the rectangles earlier.

27. Draw a series of concentric ellipses in both the top and bottom list shapes (see Figure 9.12). Make sure to leave a sizable gap between the inner ellipse and the one next to it.

    Also use a line width of about 15 for the outermost ellipse, 2 for the middle ellipse, and 4 for the innermost one. The ellipses are drawn from the center out. You may need to fiddle a bit before you get it right.
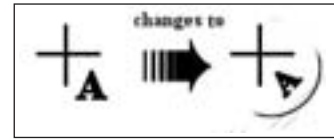
t i p

You can adjust the size of your vector object ellipses by grabbing the little black handles on the shapes while the object is selected. If it isn't selected, use the Object Selection tool (the bottom tool of the Tools toolbar) to select your ellipse by clicking on it.

You can also drag your ellipses around this way. Press Ctrl+Left Arrow to nudge the object a bit to the left. Press the Ctrl key with the other arrow keys to nudge the object in other directions.

28. Next, select the Text tool, which is fourth from the bottom of the Tools toolbar. If you have any objects already selected, des-elect them by clicking the Object Selec-tion tool on an empty part of the image before selecting the Text tool.

29. As you move the Text tool cursor around, it will have an icon like the one on the left in Figure 9.13. When you move it over a vector object, the cursor will change to the one on the right in Figure 9.13. Move the cursor over the top part of the innermost ellipse object in the upper set of concentric rings.

30. Now click on that object; you will get the Text Entry dialog box. Select the font you want from the Tool Options palette.

31. Use a font size of 12 and make sure you set the stroke width to 1.0.

Figure 9.13 Text tool cursors.

32. Type in your text, something like **16 Fluid Ounces**.

33. Make sure you have vector set in the Create As control; then click Apply.

34. Voilá! You will have text that follows the curve of the ellipse around in an arc.

35. Now add your main label text using the Text tool. You can type whatever you want and position it wherever you want.

36. When you are finished, save your file one final time as C:\3DGPAi1\resources\ch9\mycan.psp. This is your source file.

37. Next, save your work as C:\3DGPAi1\resources\ch9\mycan.jpg. Make sure you've selected the "JPEG – JIFF Compliant" type in the Save As dialog box when you do this.

38. You will get an alert saying that it will have to save the file as a merged image and asking if you want to continue. This is expected because the JPG format doesn't support layers. Click Yes.

Testing the Soup Can Skin

Congratulations! You've made your first skin! I suppose now you want to see what it looks like all wrapped around a tin can and everything. Okay, so do this:

1. Browse your way to C:\3DGPAi1 and then double-click on the Show Book Models shortcut.

2. The Torque Engine will fire up with a special program called the *Show Tool.* Click on Load Model.

3. Find mycan.dts and load it.

4. Presto! That's your skin on that there soup can! Good job!

5. You can admire your creation in all its splendor by using the navigation keys to move the can back and forth and rotate it about the various axes. See Table 9.1 for the Show Tool key commands.

6. You can view my original soup can skin by loading the soupcan.dts model.

Table 9.1 Torque Show Tool Navigation Commands

Key	Description
A	rotate left
D	rotate right
W	bring closer
S	move farther away
E	rotate top backward
C	rotate top forward

Making a Vehicle Skin

Okay, soup cans are cool and soup hits the spot, too. But now that lunch break is over, let's move on to something a bit more serious. Many people are going to have vehicles in their games, and the Torque Engine does quite a nice job of supporting vehicles. We'll be making our own vehicles later, but because this chapter is on creating skins, let's make a skin for some kind of vehicle.

For a bit of a tease, let's take a look at a vehicle that is already included in the Torque demo using the Show Tool.

1. Browse to C:\3DGPAi1 and click on the Show Racing Models shortcut. This is *not* the same shortcut as Show Book Models.

2. Click Load Shape.

3. From the list, select buggy.dts, which is near the bottom.

4. Zoom in using the navigation keys and take a gander at the buggy chassis. Pretty cool, huh? Notice that it has no wheels. In Torque we model the wheels separately, so that we can model the suspension action of the vehicle more accurately.

The Dune Buggy Diversion

Okay, okay. I knew you would want to do this, so I'll show you how to test-drive the dune buggy *in-game*, as long as you promise to come back here after you've tired out your driving fingers. People tend not to learn quite as well when they are pouting.

1. Browse to C:\3DGPAi1 and click on the Run racing Demo shortcut.

2. Click on Start Mission.

3. In the Launch dialog box, make sure that the Multiplayer Mission box is cleared.

4. Select Car Race Track from the mission list.

5. Click Launch.

6. After the game loads, have at it! You probably should switch to Chase view by pressing the Tab key—there's more to see. See Table 9.2 for the keyboard controls.

Table 9.2   Torque Racing Demo Controls

| Key	Description
mouse	steering left or right
W	accelerate
S	brake
Tab	toggle from first- to third-person viewpoint
Escape	exit the game

The Runabout Skinning Procedure

Okay, now that the old adrenaline is pumping, let's get back to making skins. We're going to create a skin for a less ambitious, but still pretty cool, vehicle—the runabout. It's a fictional creation of mine that's a convergence of memories of summers spent reading Doc Savage pulp stories and memories of a classic 1936 Auburn Boattail Speedster that I saw at a car show once as a teenager.

1. Open C:\3DGPAi1\resources\ch9\runabout.bmp in Paint Shop Pro. This file contains the UV mapping template.

   This time, I've unwrapped the object differently. If you recall, the soup can was completely unwrapped so that each individual face was lying flat. This time I unwrapped the runabout by showing only the separate objects (except the cab) from one particular view—the side or the top.

   By doing this, I can treat each of these objects as symmetrical, with the hidden side being simply a mirror image of the visible side. This is another valid technique, but it does have some pitfalls, which we will encounter. The advantage of using this approach is that it saves on image editing time, because only half of the objects' surfaces need to be given textures.

2. Select the Pen tool (second from the bottom). Set the line color to red and the fill to transparent.

3. Select Segment Type to be Point to Point on the Tool Options palette, as shown in Figure 9.14.
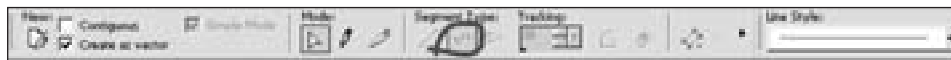
Figure 9.14 Point to Point Segment Type button.
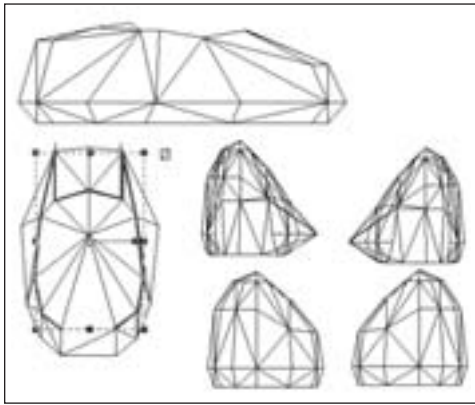
Figure 9.15 Tracing the cab roof.

4. Using the selected object with the thicker lines in Figure 9.15 as a guide, trace a shape around the cab triangles that cover the roof and the C-pillar. You click at a start location and then click again at each place around the cab where the object's line will change direction. Each click defines a *node* of the object.

5. When you have made the last node of your object, click on the Object Selection tool (bottom icon of the Tools toolbar). The object will now be surrounded by a rectangle with reshaping handles (black squares).

6. If you are not happy with the shape you've made, select it again with the Object Selection tool (if it isn't already selected), and then click the Pen tool. In the Tool Options palette in the Mode section, click on the little white arrowhead icon, which is the Edit Mode button (see Figure 9.16).


Figure 9.16 Edit Mode button.

7. Move your cursor down to your object and reshape the object by grabbing and moving the little square node handles (see Figure 9.17) that are located at the places where you clicked when creating the object—these are the nodes.
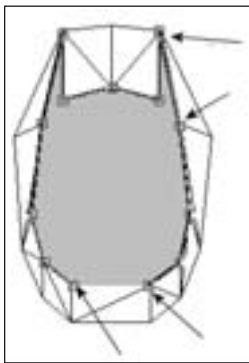
Figure 9.17 Arrows indicate the editable node handles.

8. Once you've finished, change the fill color of the object you've just created to the color of your choice, and make the line color transparent. By drawing the object in this way, you don't have the fill color obscuring your template while you trace the outline. Using red line color when you are drawing helps to differentiate between the template's black lines and the lines you are making.

9. After you've finished with the cab roof, right-click anywhere on the drawing to deselect the object you just drew, and then set the line color back to red and the fill color back to transparent.

10. Next, draw an outline around the entire cab template, following the outside edges. When finished, click the Object Selection tool.

11. Set the fill of this new object to a dark green-gray color, and set the line color to transparent. The new object should now obscure both the earlier roof object plus the rest of the cab template.

12. Select the new object with the Object Selection tool, and then choose Objects, Arrange, Send to Bottom. This will move the last object you created to be positioned underneath the first object you made that covered the roof. See Figure 9.18 to see what the before and after should look like.

13. Next, create a new raster layer by right-clicking the Layer palette and choosing New Raster Layer. Accept the defaults and click OK in the dialog box that appears.

14. Now find the Paint Brush tool (the seventh one down), but instead of just clicking the icon, click the little black triangle or arrow on the right side of the icon. A pop-up icon list will appear, from which you should select the Air Brush.

15. Set your foreground color to be the same blue (or whatever) color you used for the cab roof.

16. Now set your Air Brush tool options to match those in Table 9.3.

17. Use the Air Brush to spray over the outline of the car's body, as shown in Figure 9.19. Remember to make sure that the new raster layer you created (probably called Raster 1) is selected in the Layer palette, otherwise your airbrushing will be applied to the wrong layer.
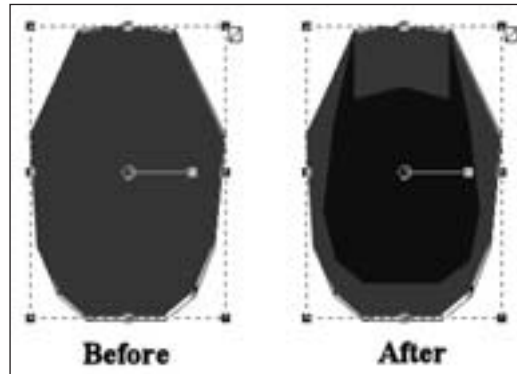
Figure 9.18 Before using Send to Bottom, and after using it.

Table 9.3 Air Brush Settings

Setting	Value
Shape	Round
Size	32
Hardness	9
Step	1
Density	100
Thickness	100
Rotation	0
Opacity	35
Blend Mode	Normal
Rate	5

Figure 9.19 Spray-painting the body base color.

Figure 9.20 Spray-painting the accent color.

18. Now change to a light blue foreground color, and set the Air Brush size to 16 and the opacity to 12.

19. Spray on the accent color, as shown in Figure 9.20. When I did it, I sprayed one long line from left to right, and then I went back and used short spurts to make the line more irregular.

20. Next you'll apply a fancy racing stripe. Select the Pen tool, and change it to Drawing Mode by clicking on the little pencil icon next to the Edit Mode arrow we used earlier.

21. Make sure that Create as vector is set in the Tool Options palette, and then select Freehand for the Segment Type, also in the Tool Options palette.

22. Set the line color to be yellow.

23. Draw a squiggly line, with a shape like the one in Figure 9.21, from left to right on the car body. You can edit the shape of the line by twiddling the node handles, just like you did earlier when we made the cab roof. To make your line look more like Figure 9.21, choose the Object Selection tool, and deselect the line.

So, there you have it—the car's body paint job is done. Notice that we used a different approach than we did with the cab. It just goes to show that there's more than one way to skin a *cat*…er, *car*! I meant car! Honest.

Well, I guess it's time to get back to work. The last bits left are the four wheel-well, fender thingies. We'll do these in a fashion similar to the way we did the cab.
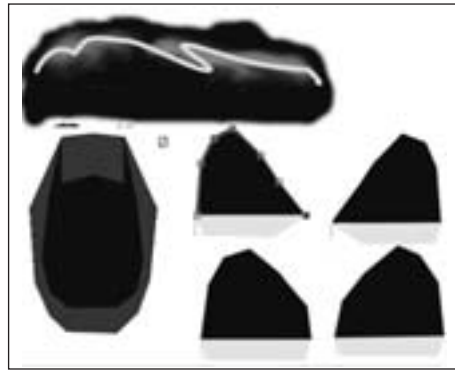
24. Using Figure 9.22 as a reference and using the Pen tool set to Point to Point Segment Type, draw an outline of the upper part of the upper-left fender thingy and fill it with the basic blue we've been using.

Figure 9.21 Adding the racing stripe.

25. After creating the last node, choose the Object Selection tool and make sure the object you just made is selected.

26. Choose Edit, Copy to copy the object to the Clipboard.

27. Choose Edit, Paste, Paste As New Layer. The new object will be pasted in its own layer.

28. Choose Image, Mirror. This will cause your new object to face left instead of right, or vice versa. This is why I used Paste as New Layer, instead of Paste as New Vector Selection. When you use the Image, Mirror menu or the Image, Flip menu, all the objects on the current layer are affected. By creating a new layer with just the one object, you avoid this problem.

29. Place your new copy of the object over the upper-right fender thingy template, adjusting it with the Pen tool in edit mode if necessary.

Figure 9.22 The fender thingies.

30. Repeat steps 24 to 29 for the bottom two fenders.

31. Now repeat all of steps 24 to 30, but this time create the fender skirts with a fill color of yellow, which stylishly matches the racing stripe.

32. When you are finished, save your file one final time as C:\3DGPAi1\resources\ch9\myauto.psp. This is your source file.

33. Now save your skin as C:\3DGPAi1\resources\ch9\myauto.jpg.

34. Once again, you will get an alert saying that the software will have to save the file as a merged image, and asking if you want to continue. Choose Yes.

Testing the Runabout Skin

Now it's time to take our little creation out for a spin around the block, so to speak. We'll use the Show Tool just like we did with the soup can.

1. Browse your way to C:\3DGPAi1 and then double-click on the Show Book Models shortcut.

2. The Torque Engine will fire up the Show Tool. Click on Load Model.

3. Find myauto.dts and load it. A fine job, indeed! Notice the lack of wheels, the same as with the dune buggy you looked at earlier.

4. Don't forget to use the navigation keys to move the car back and forth, and rotate it about the various axes. See Table 9.1 for the Show Tool key commands.

5. You can view my original runabout skin by loading the runabout.dts model.

Unfortunately, we'll have to wait until the later modeling chapters before we can take the runabout out for a real test drive. That's okay, though—we've plenty to do in the meantime!

Making a Player Skin

Now for the Big One—the player skin, or more accurately, the *character* skin, because the following section could apply equally as well to computer-controlled characters sometimes called AI (*Artificial Intelligence*) players or NPCs (*Nonplayer Characters*).

The character we'll use as the basis for this section is one affectionately called the *Standard Male Character*. He was created to be the base model for derivatives to be used in the *Tubettiworld* game that is currently in development at Tubetti Enterprises.

Figure 9.23 shows an early prototype of the Standard Male Character striking a heroic pose in the wilderness, confronting his, um, well, some trial or tribulation, I guess. This character began life as a concept sketch I did while nestled in front of a roaring fire on vacation in the Laurentians. My wife told me what the character should look like, and I sketched him about a hundred times until she was happy with it (see Figure 9.24).

I sent the concept artwork to a talented young man who goes by the name Psionic (http://www.psionic3d.co.uk) on the Internet, and he created the original model prototypes for me. The model came out pretty well, but as I said, the character in Figure 9.23 was an early prototype. The main issue was the skin color—it was too pasty. But that was soon fixed. We have since used that model to generate variations in gender, build, ethnicity, and animation sets, mostly by modifying skins, but with some model changes as well—especially for the female versions.

The point here is that for all of your serious artwork, models, skins, and so on, it's a good idea to create concepts beforehand—on paper or digitally, it doesn't matter. This way you have a tool to communicate the idea that you have in your head. It may take weeks or months to get a model completed, and it can happen that you stray unacceptably far from your original concept. It's especially important to have concept artwork if you want to sell a game idea to build a team and recruit talent to help you. If they can go away with a few pictures in their minds of what your dream is, it will help you a great deal.

Figure 9.23 The *Tubettiworld* Standard Male Character model rendered by the Torque Engine.

The Head and Neck

Now on with the show. Take a look at Figure 9.25. This is the unwrapped UV template for

the Standard Male. I've labeled the various parts in the picture to help identify what goes where. The file C:\3DGPAi1\resources\ch9\player.bmp has the proper template in it (though without the labels) for you to work with. Let's get started.

1. As before, open the template file, this time called C:\3DGPAi1\resources\ch9\player.bmp, save it somewhere as a PSP file, and work with that.

2. Create a new raster layer and name it "Skin" in the New Raster Layer dialog box. You are going to create a lot of raster layers in this procedure—make sure you label each one as I indicate.

3. Using whichever technique you like best, cover the entire face and neck part of the template with a flesh color, as in Figure 9.26. (I use the RGB values shown in Table 9.4 for a basic flesh color. Of course, you are free to twiddle the numbers to get something you like.) Make sure you apply your color to the skin layer and not to the background layer that holds your template.

tip

Normally you can draw a vector object directly to a vector layer or create it as a raster on a raster layer. The problem is that once you've drawn it, you can't adjust it. The solution is to draw your object as a vector on a new vector layer and then add it to a raster layer when you have finished with it. You do this by setting all the layers you aren't interested in to invisible (click on the eye icon next to each layer in the Layer palette). You want to have only two layers visible: the vector layer of the object you just made and the raster layer you want to add it to. Then you choose Layers, Merge, Merge Visible. Your vector layer will be converted to raster form and added on top of the raster layer. Then just set all the rest of your layers to be visible again by clicking on their eye icons one more time.

Figure 9.24 Concept artwork for the Standard Male Character.
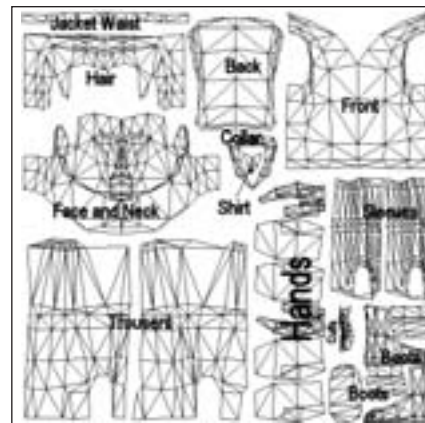
Figure 9.25 UV template for the Standard Male.
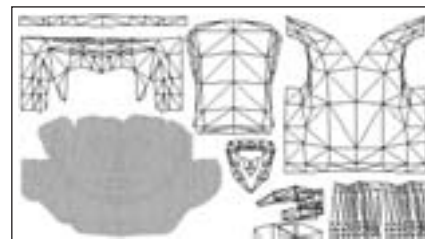
Figure 9.26 Basic flesh tone applied to the skin layer.

Table 9.4 Flesh-Tone RGB Settings

	Color Component	Value
Basic	Red	215
	Green	165
	Blue	95
Shadow	Red	183
	Green	133
	Blue	83
Highlight	Red	247
	Green	187
	Blue	107

t i p

In Figure 9.26 you can see the lines of the UV template through the skin layer's flesh color. Do this by reducing the opacity of the skin layer to about 95 percent or so. In the Layer palette, slide the Opacity slider left until it gets to the value you want. The lower you set the opacity, the more you can see of the layer beneath it—however, the less your skin layer's colors will look like their actual settings.

4. Now comes a bit of magic. You need to get some basic skin shading done next. There is a highlight and shadow image template that I like to use to get the basic head shades in place. Figure 9.27 shows the template, and you have a copy of it (C:\3DGPAi1\resources\ch9\hilite.png) that you can use for your own purposes. Open this file in Paint Shop Pro.
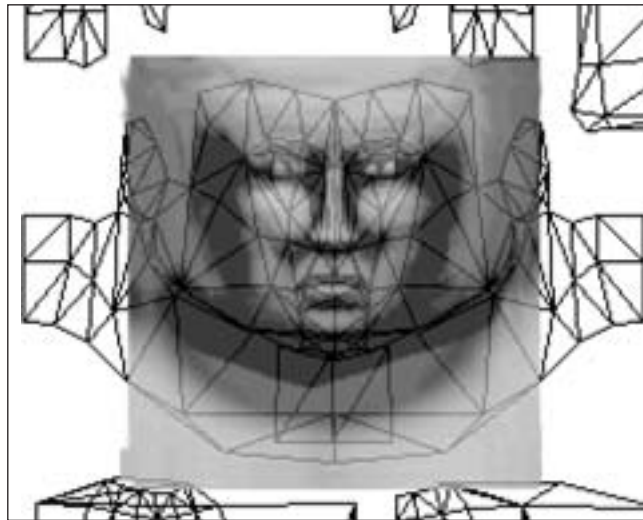

Figure 9.27 Hilite template.

5. With the hilite.png image file active, choose Edit, Copy. You must make sure that you have no selections in the image. You can make doubly sure by choosing the Selection tool and right-clicking inside the image; this will deselect any selections that might exist—sometimes they can be so small that you don't notice them.

6. Find your working copy of player.psp in Paint Shop Pro, and choose Edit, Paste, Paste as New Layer. This will paste the hilite image you copied into a new raster layer. Rename the layer as "Hilite". The first thing you will probably notice is that it is larger than the head and neck template area.

7. Choose Image, Resize and you will get the Resize dialog box. Clear the Resize All Layers box, and then in the Pixel Dimensions frame, set Height and Width to 80, and choose Percent from the combo box to the right. Click OK.

8. Now lower the opacity of the new layer to about 80 percent.

9. Make the skin layer invisible.

10. Drag the image around until you get the best fit over the UV template of the head and neck.

    You should get an image that looks like Figure 9.28.

Being the astute observer that I know you are, you've no doubt noticed that although the hilite template fits quite well at 80 percent of its full size, it's not exactly right. For one thing, the eyes are wrong—the hilite of the eye area needs to be slanted to match the contours of the UV triangles. We're going to fix that right now.

Figure 9.28 Hilite template applied over the head and neck UV template.

11. Make sure that the new raster layer with the hilites on it is active by making sure that its entry in the Layer palette is selected. Then choose the Selection tool, which is the fifth tool from the top of the Tool palette.

12. Select an area around the right that encompasses the eye, the brow above, and a small amount of the upper cheek below, but no part of the bridge of the nose.

13. Choose Image, Rotate, Free Rotate. In the Free Rotate dialog box, click on Left and then click on Free. Type **5.00** into the Free box and click OK.

t i p

The hilite.png template was created by taking several full-face photos and drawings and stretching the contrast of each quite a bit in grayscale. The images were then all overlaid and averaged to give a resulting template. That result was then tested in a few models and manually tweaked a few times. The originals were chosen to be all of the same face shape and type. Different templates for different ethnicities and face shapes were made this way.

14. The eye area has rotated. Press Ctrl+Up Arrow to nudge the selection up once and then Ctrl+Right Arrow to nudge it once to the right.

15. Right-click in the image to deselect the selection, and check to make sure that it is aligned correctly. If it isn't, press Ctrl+Z and you will get your selection back. You can then rotate it or nudge it some more.

16. When you have the eye hilites placed, repeat this process for the other eye.

17. Lower the opacity for the hilite layer to about 20 percent, and raise the opacity of the skin layer to 100 percent.

18. Save your file (just a precaution).

Now you have something like Figure 9.29, with the rough shading and coloring of flesh tones showing the major features of the face. At this point it becomes a case of filling in the details. You can go ahead and do it however you like. Zoom in close and use the Air Brush and Paint Brush tools. Add lip color, eyebrows, eye details, and ears. You might find it hard to put actual eye color in, but give it a try.

Figure 9.29 Hilite template applied over the skin layer.

Eye detail can be added by creating ellipse objects on a scratch vector layer, sizing and rotating them correctly, and placing them over the eye areas. When you create eyes remember that the colored area in the center, the combined pupil and iris regions, usually has a white or otherwise light spot offset a bit to one side and a bit above center, as shown in Figure 9.30.

Also remember that certain areas of the face are usually lighter in tone than others, like the upper part of the lower lip, the upper eyelid, the nostrils, and so on.

You can make a good five-day stubble by using the Paint Brush with the density set low, like 25 percent or so. Dab the brush in the areas where it is needed. Make a moustache by applying the stubble brush over and over to the upper lip. Encourage yourself to experiment!

Eventually you will end up with something like Figure 9.31.

Figure 9.30 An eye.

Hair and Hands

Next we'll tackle the hair and hands of the Standard Male. We'll do these two together because they both use skin (flesh) tones (the guy is going to have a bald spot). Once these are done, we are finished with the skin part of the skin. Or something like that.

Both of the next subsections will be using the skin layer in addition to other layers.

Figure 9.31 Finished face and neck.

Hair Textures

Hair has a pattern, though not a specific pattern. There is often quite a bit of randomness, but nonetheless there is a grain, if you will, like the grain in a wooden plank or the lay of a lawn. There's a clue there!

Try this:

1. Locate the hair portion of the UV template in your working file, player.psp.

2. Draw an object that encompasses the hair, and set the fill to match the color of the hair you used in the bits that show in the head area as in Figure 9.32.

3. Copy that object and paste the copy into another new layer. Modify the fill of that object. (Reminder: You can do this by double-clicking on the object with the Object Select tool and then clicking on the Fill color box.)

4. Set the hair RGB color value to those listed in Table 9.5.

5. Select the Texture check box.

6. Click the Current Texture display box and select Grass02 from the list that pops up.

Figure 9.32 Filled hair template area.

7. Set Angle to 90 and Scale to 50.

Table 9.5 Hair Color RGB Settings

Color Component	Value
Red	251
Green	178
Blue	129

8. Click OK to close the Color dialog box and then again to close the Properties dialog box. You will get something similar to Figure 9.33.

9. Merge the new layers you created with your skin layer, using the Merge Visible technique I showed you earlier.

10. After you do this, the layer will be named "Merged". Rename it to "Skin" again, by right-clicking on the layer's name in the Layer palette, choosing Rename, and then typing in the name.
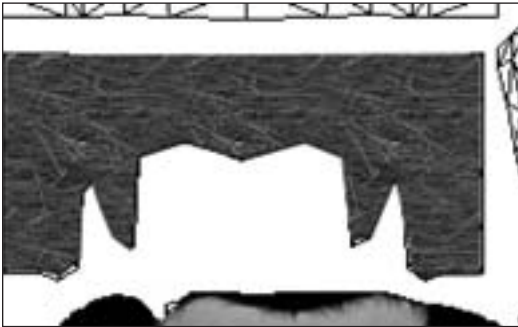
Figure 9.33 Textured hair.
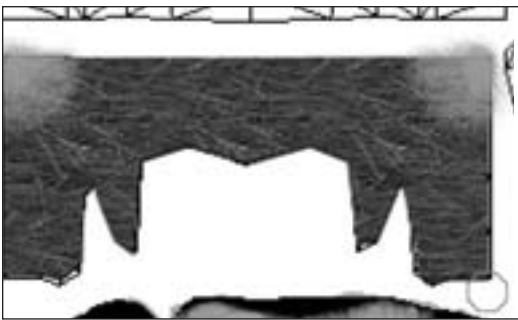
Figure 9.34 The font of wisdom under construction—the bald spot.

11. Now for the bald spot. If you look at how the triangles in the UV template are arranged you can see that the upper-left corner of the hair area and the upper-right corner of the hair area meet when they are wrapped back onto the model. The place where they meet is the crown of the head, which just so happens to be one of the two places where classic male-pattern baldness begins!
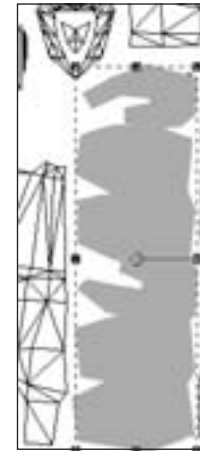
Choose the Air Brush and set its size to about 32, its density to about 25, and its foreground color to the highlight flesh tone found in Table 9.4.

12. In each of the corners, spray some bald skin on, sparser toward the inner areas and denser as you move toward the corners, until you have a substantial patch of bare skin and a surrounding area of varying thinness (see Figure 9.34). Don't worry about overspraying the edges, those areas outside are not going to be rendered.
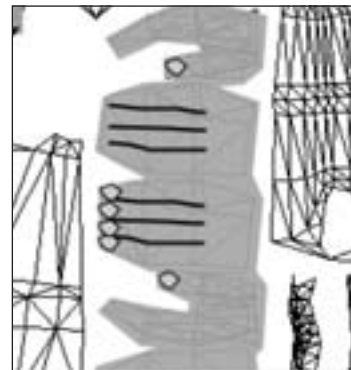
The Hands

The hands need to be skinned on three sides. You should use the basic flesh tone, with some shadow color for areas between the fingers.

1. Once again using the Pen tool with the Point to Point Segment Type, draw an object that surrounds the area that comprises the hand UV template (Figure 9.35).

2. Set the fill color of the object you just made to the basic flesh tone.

3. Start a new vector layer.

4. Using the Pen tool with the Segment Type set to Freehand, Line Width set to 2.0, and Color set to black, draw the lines that separate the fingers. Use Figure 9.36 as a guide.

5. Put the Pen tool back into Point to Point mode, and draw a fingernail. Make sure the line color is black, and use a fairly bright pink for the fill color.

6. Place your lines and fingernails appropriately (as in Figure 9.36), and fiddle with the shapes until you are happy.

7. Set the opacity of the layer to about 10 or so. That bright pink fingernail color is not so bright anymore.

8. Merge the two layers you just created into the skin layer.

9. Using the touchup brushes (ninth from the bottom of the Tools toolbar) and the Air Brush tool, add shading and irregularity to the lines as in Figure 9.37.

10. Weaken some of the darker lines. Add lighter highlights around the main knuckles and darker wrinkles around the other knuckles.

11. Eventually you will arrive at something that works for you, similar to Figure 9.38.

The Clothes

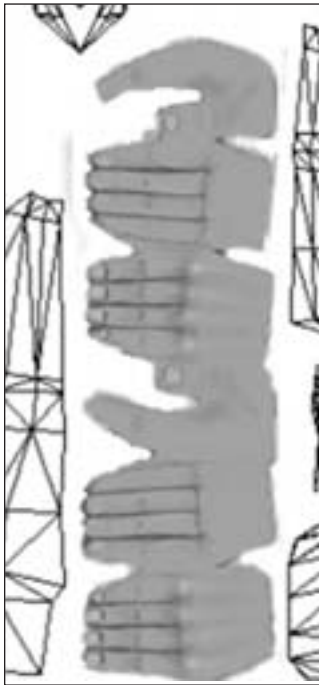We'll spend most of our time remaining in this chapter working on the jacket. You've already learned and applied almost all of the new skills required to do the clothing.
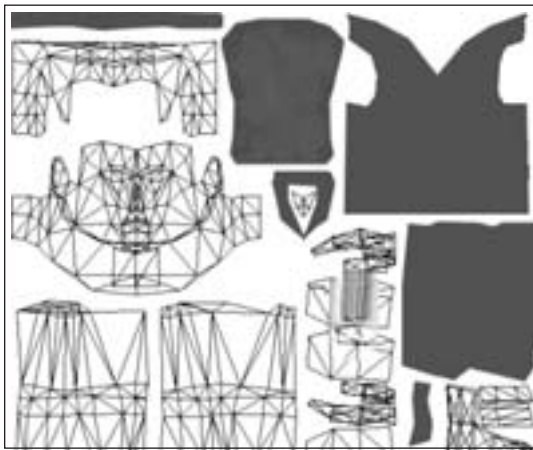
Figure 9.35
Hand area.

Figure 9.36 Finger lines and fingernails.

Figure 9.37 Adding hand details.

Figure 9.38 The finished hands.

The Jacket

It's a leather jacket. Quite a nice one too. Wouldn't mind one like that myself! The color is a basic brown, with the usual darker shadows and lighter highlights, just like with the flesh tones. Things to note are that the jacket "blouses" at the waist and at the cuffs. This is a wrinkling effect that occurs as the material is gathered in for the seam work in those areas.

1. Start off by drawing objects around the back, the front, the waist, the cuffs, the collar, and the sleeves in a fashion similar to what we've done in the past (see Figure 9.39). Make sure you do this on a new layer and name it "Jacket".

2. Set the fill color to the basic brown, using the values shown in Table 9.6.

3. On the Tool Options palette, just to the right of the Presets box, is another box with brush configuration choices. Click on that box, and then choose Small Bristles Hard from the icon list.

Figure 9.39 The jacket pieces.

**Table 9.6**   Jacket Color RGB Settings

Color Component	Value
Red	140
Green	68
Blue	62

4. To get that stippled leathery look, choose the Air Brush and set it as shown in Table 9.7.

Table 9.7 Air Brush Settings

Setting	Value
Shape	Round
Size	26
Hardness	100
Step	10
Density	50
Thickness	100
Rotation	0
Opacity	90
Blend Mode	Normal
Rate	5

5. Merge all your new layers onto the skin layer.

6. Spray the leather areas of the jacket with short sharp strokes—just enough to get the stippled look to appear. Do this for all the leather areas: back, front, collar, and sleeves. Figure 9.40 gives an idea what I've done: The back (on the left) has the stippled look, while the visible part of the front (on the right) does not.

7. Use the Lighten/Darken brush (the tenth brush down in the Tool palette) to make the contours of the gathers at the bottom of the front of the jacket.

8. Use the Smudge brush and the other touchup brushes to tweak the contours to your liking (for example, as in Figure 9.41).

9. You can create the zipper and the zipper flap by using the Pen tool to draw a line from the neck to the bottom. Make one line with a width of about 3.0, and then copy it and paste the copy next to the original line.

10. Edit the properties of the new line and change its width to 7. This will be the flap.

11. Merge the new layers to the skin layer, and then touch up the zipper area with stippling and make other tweaks to get it to coordinate with the other areas of the jacket.

12. You can do all the other areas of the jacket in the same way as shown in steps 4 to 11.
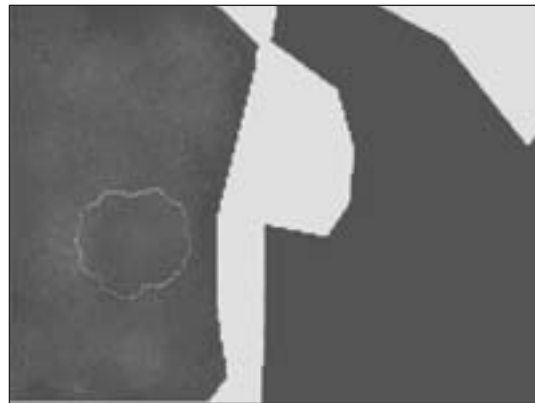
Figure 9.40 Getting close to that leathery look.
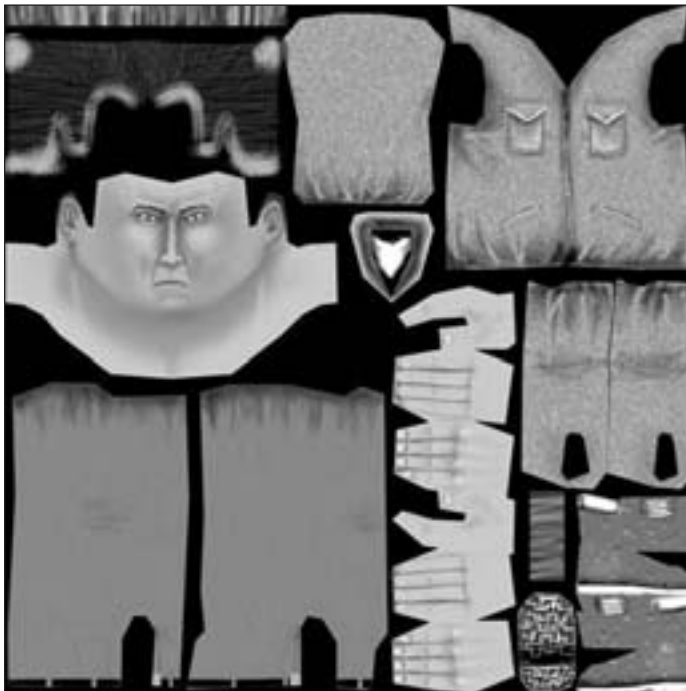
Figure 9.41 That leathery look.

The Trousers

The trousers can be done using exactly the same techniques as used for the jacket. You just need to use different colors and perhaps a different texture or airbrush density or step value. By now, you should be pretty handy with the toolkit in Paint Shop Pro, so I'll leave you to do the trousers on your own. Don't forget to make a belt—it goes at the bottom of the trouser area in the UV template.

The Boots

The final area to apply texture to is the boot area. Again, you've practiced all the techniques required to make the boots as well. There is one thing I want to show you, though, that will help, and that is the built-in textures in the Color dialog boxes.

If you click on the Color box in the Materials palette, or the Color box in the Properties dialog box of an object, you will see a tab for Patterns, and then to the right side, a box for Textures. The textures will be applied to whatever color mode (tab) you have selected, so

that you can have, say, textures applied to patterns. In the Pattern list there is a Tire Tread pattern that would be suitable for the bottom of the heel of a boot, and in the Textures list there are many textures that would be suitable for different parts of the boot.

Make sure you save your work in player.psp, and then save another version as C:\3DGPAi1\resources\ch9\player.jpg.

Figure 9.42 shows the complete skin for the Standard Male.

Figure 9.42 Standard Male skin.

Trying It On for Size

As you learned earlier in the chapter, you can use the Show Book Models shortcut and load the player.dts model. You will be able to view the Standard Male character with your new skin on it. You'll probably see areas that need fixing up, and so go ahead and do just that.

Moving Right Along

In this chapter you learned how UV unwrapping relates to the texture files known as *skins*. And you learned how to apply that understanding to images for game objects ranging from the simple (a soup can) to the complex (a human character).

I hope you also take away from the chapter the idea that hand-drawn concept artwork is a useful tool. Draw everything in sketch form before you start working on your models. It's a great help.

Finally, you can see that a fully featured image processing tool like Paint Shop Pro has quite a few features to ease the effort of creating images for skins. We've only scratched the surface of what the program can do. Don't be shy about using Paint Shop Pro's built-in Help utility. It's well done and chock-a-block-full of information.

If you want to make great skins, you are going to need to practice, practice, and practice some more. Here are some of the many ways to do this:

- Create your own models and make the skins.
- Make skins for other people's models.
- Make skins for other people for popular games like *Half-Life* and *Tribes*.
- Make monster skins, policeman skins, airplane skins, light pole skins.
- Make a set of stock skins.
- Make skin templates that you can use to make the skinning task easier.

But most of all, get down and do it!

In the next chapter, we will continue with the visual aspects of developing our game, but this time we will be looking at how to create graphical user interface (GUI) elements, by using Torque script to insert images and controls.