Splines and Extended Splines

Learning Objectives

After completing this chapter, you will be able to:

- ***Use the AutoGrid option***
- ***Create splines***
- ***Create extended splines***

INTRODUCTION

3ds Max has several basic 2D geometric shapes known as splines and extended splines. They are used to create 3D objects, 3D surfaces, and paths for lofting and creating animation. All splines and extended splines can be created dynamically by using the mouse or by entering the parameters in the **Keyboard Entry** rollout. In this chapter, you will learn about splines and extended splines.

AutoGrid

The **AutoGrid** option helps you to create an object on the surface of another object by generating a temporary grid on it. You can use this option by selecting the **AutoGrid** check box, which is available in the **Object Type** rollout of all object categories such as **Geometry**, **Shapes**, **Lights**, **Cameras**, and so on in the **Create** panel of the **Command Panel**. When you choose a tool from the **Object Type** rollout, the **AutoGrid** check box becomes active.

Choose **Create > Geometry** in the **Command Panel**; the **Standard Primitives** option will be displayed in the drop-down list. Now, choose the **Sphere** tool and create a sphere in the Perspective viewport, refer to Figure 5-1. Choose the **Torus** tool; the **AutoGrid** check box, located at the top of the **Object Type** rollout, will be activated. Select this check box; the gizmo will be displayed in the viewport along with the cursor to specify the position of the torus. Click on the top of a sphere in the Perspective viewport; a temporary grid will be created in the Perspective viewport. Now, drag the cursor to create the torus; it will be created on the surface of the sphere, as shown in Figure 5-2.

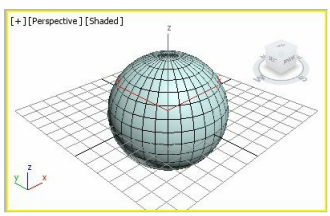


Figure 5-1 *The sphere created*

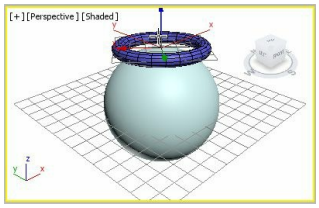


Figure 5-2 *The torus created after selecting the* ***AutoGrid*** *check box*

Note
The temporary grid will be visible only in the Perspective viewport.

CREATING SPLINES

To create splines, choose **Create > Shapes** in the **Command Panel**; the **Splines** option will be displayed in the drop-down list below the **Shapes** button. Now, activate the viewport in which you want to create the spline by clicking on it and then choose the corresponding tool from the **Object Type** rollout. In this section, you will learn to create and modify the splines and extended splines using various tools available in the **Object Type** rollout.

Note
By default, the ***Start New Shape*** *check box is selected in the* ***Object Type*** *rollout. This check box enables you to create new shapes separately in the viewport using different tools such as* ***Line****,* ***Circle****,* ***Arc****, and so on available in the* ***Object Type*** *rollout. If you clear this check box and then create new shapes, the newly created shapes will be added to the current shape in the viewport. However, the* ***Section*** *shape is an exception.*

Creating a Line Spline

Menu bar: Create > Shapes > Line
Command Panel: Create > Shapes > Splines > Object Type rollout > Line

To create a line spline, activate the viewport and then choose the **Line** tool from the **Object Type** rollout; various rollouts will be displayed, as shown in Figure 5-3.

To create a line spline dynamically, click in the Top viewport to specify the first vertex or the start point of the line. Now, move the cursor to define the distance between the first and the second vertex, and click on the viewport to create the second vertex. Again, move the cursor and click to create additional vertices. Next, right-click to end the command; an open line spline will be created, as shown in Figure 5-4. To create a closed line spline, instead of right-clicking at the end, move the cursor over the first vertex and click on it; the **Spline** message box will be displayed, as shown in Figure 5-5. Choose the **Yes** button; a closed line spline will be created, as shown in Figure 5-6.

You can also create a line spline using another method. Click in the viewport to specify the first vertex and then move the cursor to define the distance between the first and the second vertex. Now, press and hold the left mouse button and drag the cursor to create additional vertices; a line spline with a bezier vertex and smooth curve will be created. The bezier vertex is controlled by two points

on both endpoints, which help in modifying the curve of the line.

While creating a line spline, if you click in the viewport to create additional vertices, they will become corner vertices, as shown in Figure 5-7. But, if you click and drag to create additional vertices, the curve between the vertices will be smooth and the vertices will be bezier, as shown in Figure 5-8, depending on the options you select in the **Drag Type** and **Initial Type** areas of the **Creation Method** rollout.

Various rollouts used to create and modify a line are discussed next.

Rendering Rollout

The options in this rollout are used to toggle the shape renderability in the viewports and rendered output. It is also used to specify the cross-section settings and apply coordinates. These options are discussed next, refer to Figure 5-9.

Enable In Renderer

By default, the line spline created by you is not visible at the time of rendering. Select the **Enable In Renderer** check box to render spline as 3D mesh.

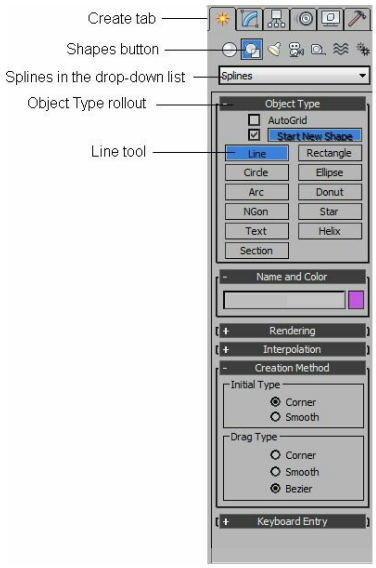


Figure 5-3 *Various rollouts displayed to create and modify a line spline*

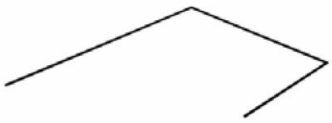


Figure 5-4 *An open line spline created*

Figure 5-6 *The line spline closed*

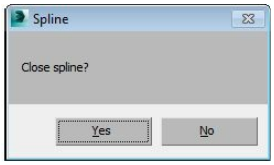


Figure 5-5 *The* ***Spline*** *message box*

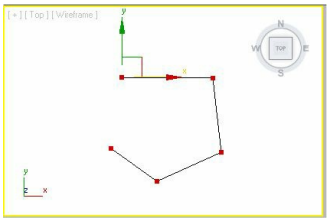


Figure 5-7 *A line with corner vertices*

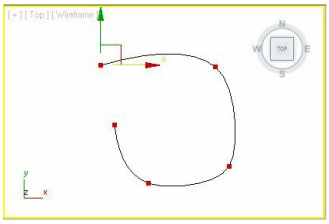


Figure 5-8 *A line spline with bezier vertex and smooth curve*

Enable In Viewport

Select the **Enable In Viewport** check box to make the line visible as 3D mesh in the viewport. The **Use Viewport Settings** check box is used to set different rendering parameters and display the mesh genearated in the viewport. It is activated only when the **Enable In viewport** check box is selected. On selecting the **Use Viewport Settings** check box; the **Viewport** radio button will be activated.Select this radio button and modify the parameters such as **Thickness** and **Sides** in the respective spinners; the line will be displayed as a 3D mesh in the viewport according to the parameters you set.

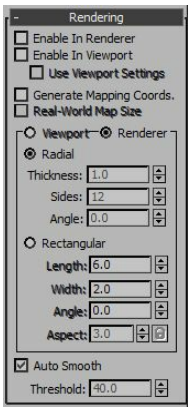


Figure 5-9 *The* ***Rendering*** *rollout*

Viewport

This radio button will be activated only if the **Use Viewport Settings** and **Enable**

In Viewport check boxes are selected. It is used to specify the dimension and shape of the line in the viewport using the **Radial** or **Rectangular** radio button, respectively.

Renderer

This radio button is used to specify the dimension and shape of the line on rendering, using the **Radial** or **Rectangular** radio button. Note that you can view the modifications in the line at rendering, only if the **Enable In Renderer** check box is selected.

Radial

This radio button is used to display the shape with a circular cross-section. The **Thickness** spinner is used to set the thickness of the line. Similarly, the **Sides** spinner is used to set the number of faces along with the cross-section of the line. The value in the **Angle** spinner is used to set the position of the cross-section of the line by rotating it.

Rectangular

This radio button is used to display the shape as rectangular mesh. You can set the length and width of the line in the **Length** and **Width** spinners, respectively. The **Angle** spinner is used to set the position of the cross-section of the line by rotating it. The **Aspect** spinner is used to set the constant ratio of width to length. Choose the lock icon on the right side of the **Aspect** spinner to lock the constant ratio of width to length. Now, if you set the value in the **Length** or the **Width** spinner, the values will be set in both the spinners simultaneously.

Auto Smooth

By default, the **Auto Smooth** check box is selected. It is used to smoothen the angle between the line segments depending upon the value set in the **Threshold** spinner. The value in the **Threshold** spinner is used to set the threshold angle in degrees.

Interpolation Rollout

The options in the **Interpolation** rollout, are used to define how a line will be created, refer to Figure 5-10. The number of segments between each vertex on the line are called steps. The value in the **Steps** spinner defines the number of steps between each vertex on the line. Larger the value in the **Steps** spinner, smoother will be the line.

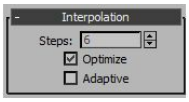


***Figure 5-10** The **Interpolation** rollout*

By default, the **Optimize** check box is selected, which helps you to remove the unwanted steps on the straight line, and you can set the number of steps by entering the value in the **Steps** spinner. If you select the **Adaptive** check box, it will automatically set the number of steps to create a smooth line. The **Optimize** check box and the **Steps** spinner will also become inactive.

Note

*The options in the **Name and Color**, **Rendering**, and **Interpolation** rollouts are same for all splines and extended splines in Autodesk 3ds Max.*

Creation Method Rollout

The options in this rollout are used while creating a line dynamically. The two areas in this rollout are discussed next.

Initial Type Area

The options in this area are used to define the type of vertex when you click on the viewport to create it. By default, the **Corner** radio button is selected. As a result, a sharp point is created and the line between the two corner vertices becomes straight. You can select the **Smooth** radio button to create a smooth and non-adjustable curve between the two vertices.

Drag Type Area

The options in this area are used to define the type of vertex of the spline while dragging the cursor in the viewport. By default, the **Bezier** radio button is selected which creates a smooth adjustable curve with bezier vertices. You can modify the shape of the curve using the two control points of these bezier vertices. The **Corner** and **Smooth** radio buttons perform the same functions as described in the **Initial Type** area.

Keyboard Entry Rollout

The options in this rollout are used to create a line by entering the

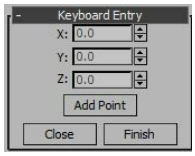


***Figure 5-11** The **Keyboard Entry** rollout*

parameters in the **Keyboard Entry** rollout, refer to Figure 5-11. The **X**, **Y**, and **Z** spinners are used to specify the position of the first vertex of the line along the axes of the home grid or a grid object. The **Add Point** button is used to create the vertex at the location specified in the X, Y, and Z coordinates in the viewport.The **Close** button is used to create a closed line and the **Finish** button is used to create an open line.

Note

*The **Keyboard Entry** rollout for all the splines and extended splines is used to create the corresponding spline by entering the parameters using the keyboard. The method of creating all splines is same as discussed above with the only difference in the type and number of parameters entered for various splines and extended splines.*

Creating a Rectangular Spline

Menu bar: Create > Shapes > Rectangle

Command Panel: Create > Shapes > Splines > Object Type rollout > Rectangle

To create a rectangular spline, activate the viewport in which you

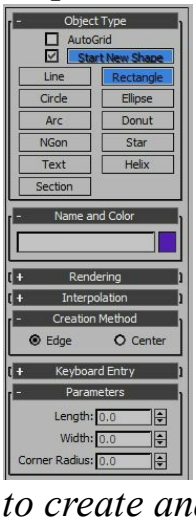


Figure 5-12 *Various rollouts to create and modify a rectangular spline*

want to create it and then choose the **Rectangle** tool from the **Object Type** rollout; the **Name and Color**, **Rendering**, **Interpolation**, **Creation Method**, **Keyboard Entry**, and **Parameters** rollouts will be displayed, as shown in Figure 5-12. Click at the upper left corner of the viewport and hold the left mouse button and then drag the cursor to the lower right corner of the viewport. Next, release the left mouse button to set the length and width values; a rectangular spline will be displayed in the viewport, as shown in Figure 5-13.

Note

You can also create a square spline, as shown in Figure 5-14, using the same method as described above. The only difference in this case is that you need to hold the CTRL key while dragging the cursor.

Various rollouts used to create and modify the rectangular spline are discussed next.

Figure 5-13 *A rectangular spline*

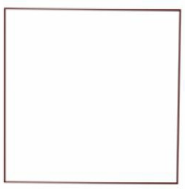


Figure 5-14 *A square spline*

Creation Method Rollout

The options in this rollout are used to create a rectangle. By default, the **Edge** radio button is

selected. As a result, a point is created in the viewport. Press and hold the left mouse button on this point and drag the cursor to define the diagonal corner of the shape. This distance between the two corner points will be the diagonal of the rectangle. You can select the **Center** radio button to create a point at the center of the rectangle and then drag the cursor to specify the distance between the center and its corner.

Parameters Rollout

The options in this rollout are used to modify the rectangular spline.

Figure 5-15 *A rectangle with corner radius*

The **Length** spinner is used to specify the length of the rectangular spline along the local Y axis. The **Width** spinner is used to specify the width of the rectangular spline along the local X axis. The **Corner Radius** spinner is used to create rounded corner for the rectangular spline, as shown in Figure 5-15.

Creating a Circular Spline

Menu bar: Create > Shapes > Circle

Command Panel: Create > Shapes > Splines > Object Type rollout > Circle

To create a closed circular spline, activate the viewport in which you want to create it and then choose the **Circle** tool from the **Object Type** rollout; **various** rollouts will be displayed, as shown in Figure 5-16. Next, press and hold the left mouse button and then drag the cursor. Next, release the left mouse button to set the radius of the circle; a circular spline will be created in the viewport, as shown in Figure 5-17.

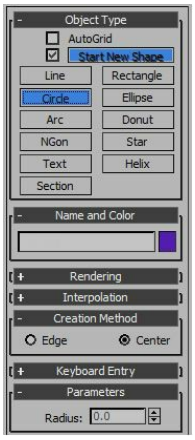


Figure 5-16 *Various rollouts to create and modify a circular spline*

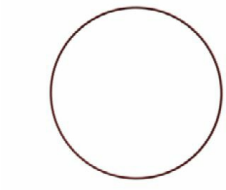


Figure 5-17 *A circular spline*

Various rollouts used to create and modify the circular spline are discussed next.

Creation Method Rollout

The options in this rollout are used while creating a circular spline dynamically. By default, the **Center** radio button is selected. As a result, a point is created in the viewport. Press and hold the left mouse button on this point and drag the cursor to define the radius of the circle. You can select the **Edge** radio button to specify a point of the circumference of the circle and then drag the cursor to define the radius of the circle.

Parameters Rollout

The options in this rollout are used to modify the circular spline. The **Radius** spinner is used to modify the radius of the circular spline.

Creating an Elliptical Spline

Menu bar: Create > Shapes > Ellipse

Command Panel: Create > Shapes > Splines > Object Type rollout > Ellipse

To create an elliptical spline, activate the viewport in which you want to create it and then choose the **Ellipse** tool from the **Object Type** rollout; the **Name and Color**, **Rendering**, **Interpolation**, **Creation Method**, **Keyboard Entry**, and **Parameters** rollouts will be displayed, as shown in Figure 5-18. Next, press and hold the left mouse button and then drag the cursor. Now, release the left mouse button to set the length and width; an elliptical spline will be created in the viewport, as shown in Figure 5-19.

 Note

You can also create a circular spline using the same method as discussed above. The only difference in this case is that you need to hold the CTRL key while dragging the cursor.

Various rollouts used to create and modify the ellipse are discussed next.

Creation Method Rollout

The options in this rollout are used while creating an elliptical spline dynamically. These options are the same as those discussed earlier.

Parameters Rollout

The options in this rollout are used to modify the elliptical spline. The **Length** spinner is used to define the length of the elliptical spline along the local Y axis. The **Width** spinner is used to define the width of the elliptical spline along the local X axis.

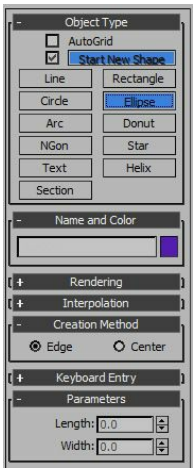


Figure 5-18 *Various rollouts to create and modify an elliptical spline*

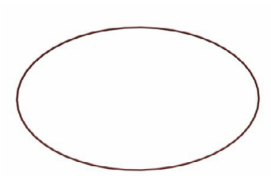


Figure 5-19 *An elliptical spline*

Creating an Arc Spline

Menu bar: Create > Shapes > Arc

Command Panel: Create > Shapes > Splines > Object Type rollout > Arc

To create an arc spline, activate the viewport in which you want to create it and then choose the **Arc** tool from the **Object Type** rollout; the **Name and Color**, **Rendering**, **Interpolation**, **Creation Method**, **Keyboard Entry**, and **Parameters** rollouts will be displayed, as shown in Figure 5-20. Various rollouts used to create and modify an arc are discussed next.

Creation Method Rollout

You can create an arc using two methods, which depend on the selection of the radio button in the **Creation Method** rollout. By default, the **End-End-Middle** radio button is selected. As a result, the first two points are created as the two endpoints of an arc and on dragging the cursor in the viewport, the third and fourth point are created between the two endpoints on the arc. You can select the **Center-End-End** radio button to specify the first point as the center of the arc, and then drag the cursor to specify the two endpoints of the arc. These methods are discussed next.

End-End-Middle Method

To create an arc using this method, activate the Top viewport and make sure that the **End-End-Middle** radio button is selected in the **Creation Method** rollout. Next, press and hold the left mouse button and drag the cursor to define the two endpoints of the arc. Release the left mouse button and move the mouse up or down to define the third and fourth point between the two endpoints on the arc, refer to Figures 5-21 and 5-22. Click on the viewport; an arc spline will be created, as shown in Figure 5-23.

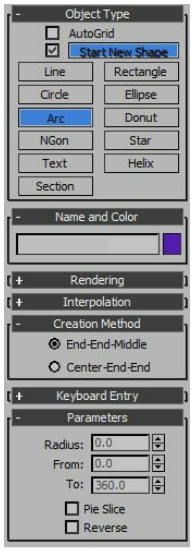


Figure 5-20 *Various rollouts to create and modify an arc spline*

Figure 5-21 *Creating an arc using the* ***End-End-Middle*** *method (step-1)*

Figure 5-22 *Creating an arc using the* ***End-End-Middle*** *method (step-2)*

Figure 5-23 *An arc spline*

Center-End-End Method

To create an arc using this method, activate the Top viewport and select the **Center-End-End** radio button in the **Creation Method** rollout. Press and hold the left mouse button to specify the center point of an arc and drag the cursor to specify the first endpoint of the arc. Now, release the mouse button and move the cursor up or down to specify the second endpoint of the arc, refer to Figures 5-24 and 5-25. Click in the viewport; an arc will be created.

Parameters Rollout

The options in this rollout are used to modify an arc. The **Radius** spinner is used to specify the radius of the arc. The **From** spinner is used to specify the start point of the arc as an angle measured from the local positive X axis. The **To** spinner is used to specify the end point of the arc as an angle measured from the local positve X axis. The **Pie Slice** check box is used to create straight segments from the endpoints of the arc to the radial center, creating a closed pie slice arc, as shown in Figure 5-26. The **Reverse** checkbox is used to reverse the direction of the arc spline and to place the first vertex at the opposite end of an open arc. To view the reversed direction, you need to convert it into an editable spline object about which you will learn in later chapters.

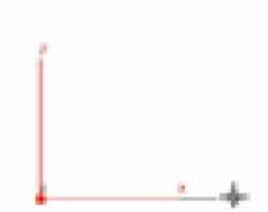


Figure 5-24 *Creating an arc using the* ***Center-End-End*** *method (step-1)*

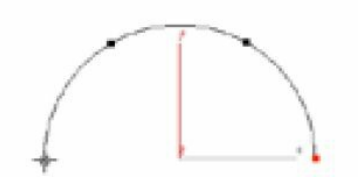


Figure 5-25 *Creating an arc using the* ***Center-End-End*** *method (step-2)*

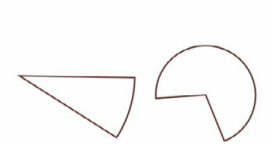


Figure 5-26 *The arcs created on selecting the* ***Pie Slice*** *check box*

Creating a Donut Spline

Menu bar: Create > Shapes > Donut

Command Panel: Create > Shapes > Splines > Object Type rollout > Donut

The **Donut** tool is used to create a closed spline with two concentric circles known as donut. To create a donut spline, activate the viewport in which you want to create it and then choose the **Donut** tool from the **Object Type** rollout; the **Name and Color**, **Rendering**, **Interpolation**, **Creation Method**, **Keyboard Entry**, and **Parameters** rollouts will be displayed, as shown in Figure 5-27.

Press and hold the left mouse button and drag the cursor. Next, release the left mouse button to set the Radius 1. Now, drag the cursor again to define the Radius 2 of the second circle and then click in the viewport; a donut spline will be created in the viewport, as shown in Figure 5-28.

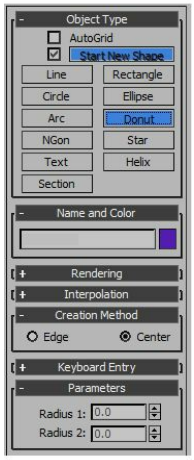


Figure 5-27 *Various rollouts to create and modify the donut spline*

Figure 5-28 *A donut spline*

Various rollouts used to create and modify the donut spline are discussed next.

Creation Method Rollout

The options in this rollout are used while creating a donut spline dynamically. These are the same as discussed earlier while creating a rectangular spline.

Parameters Rollout

The options in this rollout are used to modify the donut. The **Radius 1** spinner is used to define the radius of the first circle of the donut and the **Radius 2** spinner is used to define the radius of the second circle of the donut.

Creating an NGon Spline

Menu bar: Create > Shapes > NGon
Command Panel: Create > Shapes > Splines > Object Type rollout > NGon

The **NGon** tool is used to create a closed spline with three or more number of sides known as NGon. To create an NGon spline, activate the viewport in which you want to create it and then choose the **NGon** tool from the **Object Type** rollout; the **Name and Color**, **Rendering**, **Interpolation**, **Creation Method**, **Keyboard Entry**, and **Parameters** rollouts will be displayed, as shown in Figure 5-29.

Next, press and hold the left mouse button and then drag the cursor. As you drag the cursor, the radius value of NGon will be displayed in the **Radius** spinner of the **Parameters** rollout. Release the left mouse button to set the radius of the NGon spline; an NGon spline will be created in the viewport, as shown in Figure 5-30.
Various rollouts used to create and modify the NGon spline are discussed next.

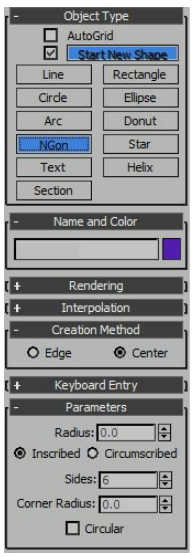


Figure 5-29 *Various rollouts to create and modify an NGon spline*

Creation Method Rollout

The options in this rollout are used while creating the NGon dynamically. These are the same as discussed earlier while creating a rectangular spline.

Parameters Rollout

The options in this rollout are used to modify the NGon spline. The **Radius** spinner is used to specify the radius of the NGon. By default, the **Inscribed** radio button is selected which specifies the radius of the NGon from its center to its corners. You can select the **Circumscribed** radio button to specify the radius of the NGon from the center to the midpoint of its sides. The **Sides** spinner specifies the number of sides of the NGon, refer to Figure 5-31. The **Corner Radius** spinner is used to round the corners of the NGon in degrees, refer to Figure 5-32. If you select the **Circular** check box, it creates a circular NGon.

Note

Create a circle and an NGon with same radius and place them in the viewport, as shown in Figure 5-33. Select the NGon and choose the ***Modify*** *tab in the* ***Command Panel****. In the* ***Parameters*** *rollout, select the* ***Inscribed*** *and* ***Circumscribed*** *radio buttons one by one to notice the difference between them, refer to Figures 5-33 and 5-34.*

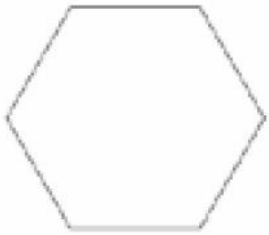


Figure 5-30 *An NGon spline*

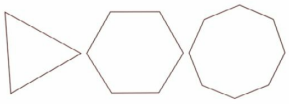


Figure 5-31 *The NGons with 3, 6, and 8 number of sides*

Creating a Star Spline

Menu bar: Create > Shapes > Star

Command Panel: Create > Shapes > Splines > Object Type rollout > Star

The **Star** tool is used to create a star-shaped closed spline with three or more number of points. To create a star spline, activate the viewport in which you want to create it and then choose the **Star** tool

from the **Object Type** rollout; various rollouts will be displayed, as shown in Figure 5-35.

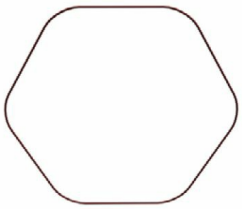


Figure 5-32 *The NGon with round corners*

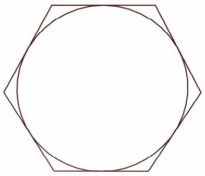


Figure 5-34 *An NGon after selecting the* ***Circumscribed*** *radio button*

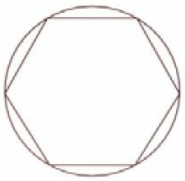


Figure 5-33 *An NGon after selecting the* ***Inscribed*** *radio button*

Press and hold the left mouse button and then drag the cursor. Next, release the left mouse button and then drag the cursor again inside or outside to define the second radius of the star. Now, click on the viewport; a star spline will be created in all viewports, as shown in Figure 5-36.

Various rollouts used to create and modify the star are discussed next.

Parameters Rollout

The options in this rollout are used to modify a star. To do so, select the star and choose the **Modify** tab in the **Command Panel**; the **Parameters** rollout will be displayed. The **Radius 1** spinner is used to specify the radius of the first set of vertices of the star. The **Radius 2** spinner is used to specify the radius of the second set of vertices of the star. The **Points** spinner is used to specify the number of points in the star, refer to Figure 5-37. The **Distortion** spinner is used to rotate the inner points around the center of the star, refer to Figure 5-38. The **Fillet Radius 1** and **Fillet Radius 2** spinners are used to round the inner and outer points of the star, as shown in Figure 5-39.

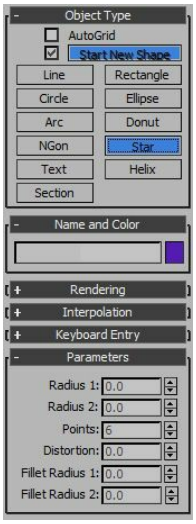


Figure 5-35 *Various rollouts to create and modify a star spline*

ts

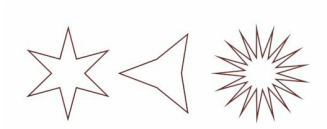


Figure 5-37 *The star splines with different number of poin*

Figure 5-36 *A star spline*

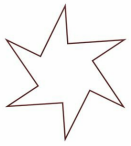


Figure 5-38 *A star after setting the value in the* ***Distortion*** *spinner*

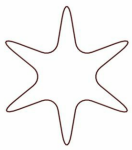


Figure 5-39 *A star after setting the values in the* ***Fillet Radius 1*** *and* ***Fillet Radius 2*** *spinner*

Creating a Text Spline

Menu bar: Create > Shapes > Text

Command Panel: Create > Shapes > Splines > Object Type rollout > Text

The **Text** tool is used to create a spline in the text shape. To create a text spline, activate the viewport in which you want to create it and then choose the **Text** tool from the **Object Type** rollout; various

rollouts will be displayed, as shown in Figure 5-40.

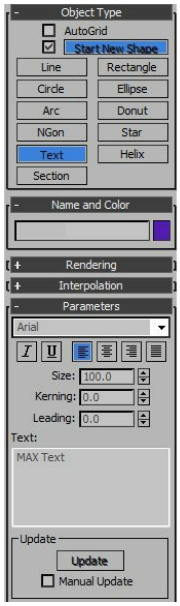


Figure 5-40 *Various rollouts to create and modify a text spline*

To create the text dynamically, type the text in the **Text** text box of the **Parameters** rollout. Next, activate the Front viewport and click on it; the text will be displayed in the viewports, refer to in Figure 5-41.

Various rollouts used to create and modify the text are discussed next.

Parameters Rollout

The options in this rollout are used to modify the text. At the top of **Parameters** rollout, a Font drop-down list is displayed. You can modify the font type of the text in the viewport by selecting the font from this drop-down list. The ***I*** and **U** buttons are used to italicize and underline the text, respectively. The alignment buttons placed on the right of the **U** button are used for the proper alignment of the text, refer to Figure 5-42. The **Size** spinner is used to modify the size of the text. The **Kerning** spinner is used to set the distance between the letters. If the text is written in two lines, then the **Leading** spinner is used to set the distance between these lines. The **Text** text box is used to enter the text that you want to display in the viewport. By default, the text in the text box is MAX Text.

Update Area

The **Update** area is used to make modifications in the text using various rollouts in the Modify panel. On doing so, the text will automatically be updated in the viewport. The **Manual Update** check box in this area, which is used for manual update of the text in the viewport. The **Update** button is used to view the updated output in the viewports for manual update.

Figure 5-41 *The text in the viewport*

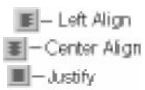


Figure 5-42 *Alignment buttons to align the text*

Creating a Helix Spline

Menu bar: Create > Shapes > Helix

Command Panel: Create > Shapes > Splines > Object Type rollout > Helix

The **Helix** tool is used to create a spline with spirals. To create a helix spline, activate the viewport in which you want to create it and then choose the **Helix** tool from the **Object Type** rollout; the **Name and Color**, **Rendering**, **Creation Method**, **Keyboard Entry**, and **Parameters** rollouts will be displayed, as shown in Figure 5-43.

Press and hold the left mouse button and then drag the cursor. Next, release the left mouse button and then drag the cursor up or down to define the height of the helix. Now, click on the viewport and move the cursor up or down to set the second radius of the endpoint. Again, click on the viewport; a helix spline will be created in viewports, as shown in Figure 5-44.

Various rollouts used to create and modify the helix are discussed next.

Creation Method Rollout

The options in this rollout are used while creating a helix dynamically. These are the same as discussed earlier.

Parameters Rollout

The options in this rollout are used to modify the helix. The **Radius 1** spinner is used to specify the radius for the start point of the helix. The **Radius 2** spinner is used to specify the radius for the end point of the helix. The **Height** spinner is used to specify the height of the helix. The **Turns** spinner is used to specify the number of turns between start and end points of the helix. The **Bias** spinner forces the turns of the helix to accumulate toward its start or end point. By default, the value in the **Bias** spinner is 0, which evenly distributes the turns between the start and end points, refer to Figure 5-45. It varies from -1 to +1. The -1 value forces the turns to accumulate toward the start point of the helix and +1 value forces the turns to accumulate toward the endpoint of the helix, as shown in Figures 5-46, and 5-47. By default, the **CW** radio button is selected. As a result, the helix turns clockwise. You can select the **CCW** radio button to turn the helix counterclockwise.

Creating a Section Spline

Menu bar: Create > Shapes > Section

Command Panel: Create > Shapes > Splines > Object Type rollout > Section

The **Section** tool is used to create a special type of spline that appears like a bisected rectangle. It generates shape based on a cross-sectional space through mesh objects. To create a section spline, activate the viewport in which you want to create it and then choose the **Section** tool from the **Object Type** rollout; the **Name and Color**, **Section Parameters**, and **Section Size** rollouts will be displayed, as shown in Figure 5-48.

Press and hold the left mouse button and then drag the cursor. Next, release the left mouse button to set the length and width of the section spline; a section spline will be created in the viewport, as shown in Figure 5-49.

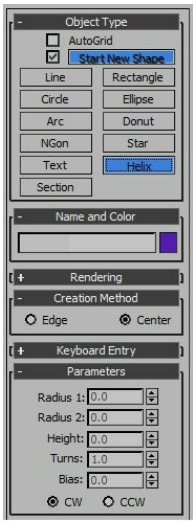


Figure 5-43 *Various rollouts to create and modify a helix spline*

Figure 5-44 *A helix spline*

Figure 5-45 *The helix spline with three turns and zero value in the* ***Bias*** *spinner*

Figure 5-46 *The helix spline with three turns and +1 value in the* ***Bias*** *spinner*

Figure 5-47 *The helix spline with three turns and -1 value in the* ***Bias*** *spinner*

Various rollouts used to create and modify the section spline are discussed next.

Section Parameters Rollout

The options in this rollout are used to create a new shape, based on the cross-section where the section spline slices the objects, refer to Figure 5-50. If you move the section spline on an object, the **Create Shape** button in the **Section Parameters** rollout will be activated. Choose this button; the **Name Section Shape** dialog box will be displayed, as shown in Figure 5-51. In the **Name** text box, enter the name of the new shape and choose the **OK** button; a new shape will be created. This new shape will be editable and will have vertex, segment, and spline sub-objects. You will learn to edit these types of splines in later chapters. The areas in the **Section Parameters** rollout are discussed next.

Update Area

This area has three radio buttons to specify when the cross-section

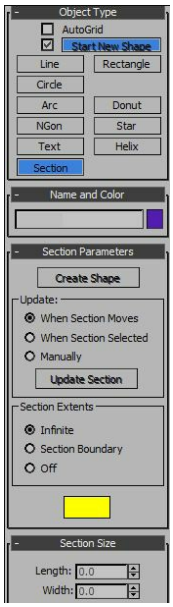


Figure 5-48 *Various rollouts to create and modify a section spline*

will be updated. By default, the **When Section Moves** radio button is selected. As a result, the cross-section will be updated while moving the section spline. The **When Section Selected** radio button in this area is used to update the cross-section when you select the section shape, but not when you move it. After selecting this radio button, you need to choose the **Update Section** button to update it. If you select the **Manually** radio button, it updates the cross-section manually by choosing the **Update Section** button.

Section Extents Area

The radio buttons in this area are used to define the extent of cross-section created by the section spline. By default, the **Infinite** radio button is selected. As a result, the section plane will be infinite in all directions and it will generate the cross-section for all the objects that come in its plane, as shown in Figure 5-52. The **Section Boundary** radio button is used to generate the cross-section only for the objects that are touched by the boundary or are inside the section plane. When you select the **Off** radio button, the cross-section will not be displayed and the **Create Shape** button will be deactivated.

By default, the color of the cross-section in a section spline is yellow. If you want to change it, choose the color swatch at the bottom of the **Section Extents** area; the **Color Selector** dialog box will be displayed. Select the new color and choose the **OK** button; the new color will be displayed in the color swatch.

Section Size Rollout

The options in this rollout are used to modify the overall size of the rectangular section spline. The **Length** and **Width** spinners are used to modify the size of the rectangular section spline.

Creating an Egg Spline

Menu bar: Create > Shapes > Egg

Command Panel: Create > Shapes > Splines > Object Type rollout > Egg

The **Egg** tool is used to create an egg shaped spline. To do so, activate the viewport in which you want to create it and then choose the **Egg** tool from the **Object Type** rollout; various rollouts will be displayed, as shown in Figure 5-53.

Press and hold the left mouse button and then drag the cursor. Next, release the left mouse button and then drag the cursor to define the thickness of the egg shaped spline; an egg spline will be created in the viewport, as shown in Figure 5-54.

Various rollouts used to create and modify the egg are discussed next.

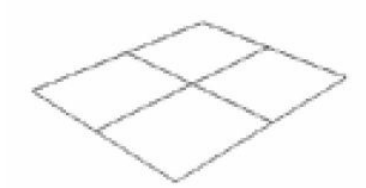


Figure 5-49 *A section spline*

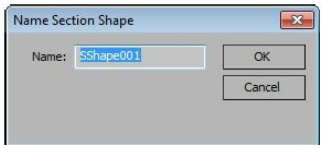


Figure 5-51 *The* ***Name Section Shape*** *dialog box*

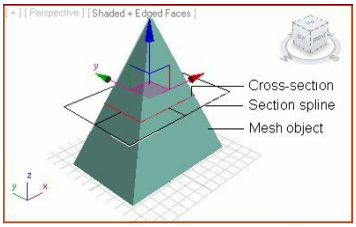


Figure 5-50 *The cross-section of the section spline according to the object*

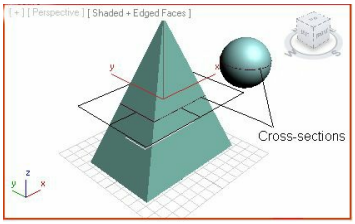


Figure 5-52 *The cross-sections generated in both the objects in their planes on selecting the* ***Infinite*** *radio button*

Parameters Rollout

The options in this rollout are used to modify the egg spline. The **Length** spinner is used to set the length of the egg spline. The **Width** spinner is used to set the width of the egg spline. By default, the **Outline** check box is selected. As a result, an additional egg shaped outline is created. The **Thickness** spinner is activated only when the **Outline** check box is selected. This spinner is used to set an outline between the main egg and its outline. The **Angle** spinner is used to set the angle of the egg spline along the local Z axis.

CREATING EXTENDED SPLINES

To create extended splines, choose **Create > Shapes** in the **Command Panel**; the **Splines** option will be displayed in a drop-down list. Select the **Extended Splines** option from the drop-down list; all tools to create extended splines will be displayed in the **Object Type** rollout. In this section, you will learn to create and modify extended splines using various tools available in the **Object Type** rollout.

Figure 5-53 *Various rollouts to create and modify an egg spline*

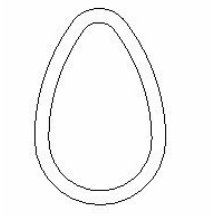


Figure 5-54 *An egg spline*

Creating a WRectangle Spline

Menu bar: Create > Extended Shapes > WRectangle
Command Panel: Create > Shapes > Extended Splines >
Object Type rollout > WRectangle

The WRectangle spline is a closed spline with two concentric rectangles.

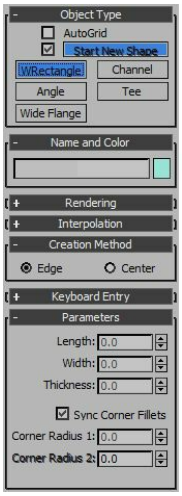


Figure 5-55 *Various rollouts of a WRectangle spline*

To create a WRectangle spline, choose the **WRectangle** tool from the **Object Type** rollout; the **Name and Color**, **Rendering**, **Interpolation**, **Creation Method**, **Keyboard Entry**, and **Parameters** rollouts will be displayed, as shown in Figure 5-55.

Press and hold the left mouse button and then drag the cursor. Next, release the left mouse button to set the length and width, and then move the cursor to define the thickness or the inner rectangle. Now, click on the viewport; a WRectangle spline will be created in the viewport, as shown in Figures 5-56.

Various rollouts used to create and modify the WRectangle are discussed next.

Note
*The options in the **Creation Method** rollout for all extended splines are same as described earlier in this chapter.*

Parameters Rollout

The options in this rollout are used to modify the WRectangle spline. The **Length**, **Width** and **Thickness** spinners are used to specify the height, width, and thickness of the WRectangle spline, respectively. By default, the **Sync Corner Fillets** check box is selected. As a result, the corners of the outer rectangle are controlled using the **Corner Radius 1** spinner. If you clear this check box, it will control the radius of the corners of both the concentric rectangles through the **Corner Radius 1** and **Corner Radius 2** spinners, refer to Figure 5-57. The **Corner Radius 1** spinner is used to specify the radius of the four corners of the outer rectangle. The **Corner Radius 2** spinner is activated only when the **Sync Corner Fillets** check box is cleared. This spinner is used to specify the radius of the four

corners of the inner rectangle.

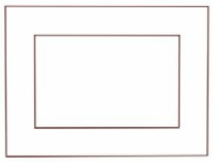


Figure 5-56 *A WRectangle spline*

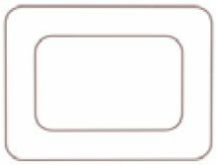


Figure 5-57 *The WRectangle spline with corner radius*

Creating a Channel Spline

Menu bar: Create > Extended Shapes > Channel
Command Panel: Create > Shapes > Extended Splines >
Object Type rollout > Channel

The channel spline is a C-shaped closed spline. To create a channel spline, activate the viewport in which you want to create it and then choose the **Channel** tool from the **Object Type** rollout; various rollouts will be displayed, as shown in Figure 5-58.

Now, press and hold the left mouse button and drag the cursor to set the length and width of the channel. Next, release the left mouse button and move the cursor to define the thickness or the inner shape. Click on the viewport; a channel spline will be created in the viewport, as shown in Figure 5-59.

Parameters Rollout

The options in this rollout are used while creating a channel dynamically. These options are the same as those discussed in the **WRectangle** tool. The channel spline with the corner radius is shown in Figure 5-60.

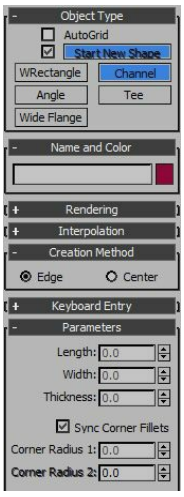


Figure 5-58 *Various rollouts to create and modify a channel spline*

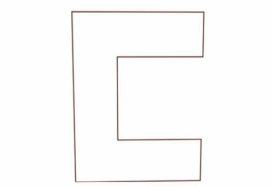
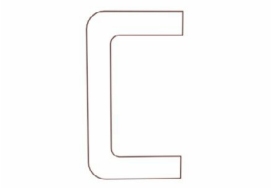


Figure 5-59 *A channel spline*



Creating an Angle Spline

Menu bar: Create > Extended Shapes > Angle
Command Panel: Create > Shapes > Extended Splines >
Object Type rollout > Angle

The angle spline is an L-shaped closed spline. To create an angle spline, activate the viewport in which you want to create it and then choose the **Angle** tool from the **Object Type** rollout; various rollouts will be displayed, as shown in Figure 5-61.

Next, press and hold the left mouse button and drag the cursor to set the length and width of the angle spline. Next, release the left mouse button and move the cursor inside to define the thickness or the inner shape. Click on the viewport; an angle spline will be created in the viewport, as shown in Figure 5-62. The **Parameters** rollout used to modify the angle spline is discussed next.

Parameters Rollout

The options in this rollout are used to modify an angle spline. The **Length**, **Width** and **Thickness** spinners are used to specify the length, width, and thickness of the angle spline, respectively. By default, the **Sync Corner Fillets** check box is selected. As a result, the radius of the corners of the outer shape are controlled through the **Corner Radius 1** spinner. If you clear this check box, it will control the radius of the corners of inner and outer shapes through the **Corner Radius 1** and **Corner Radius 2** spinners, as shown in Figure 5-63. The **Corner Radius 1** spinner is used to set the external radius between the vertical and horizontal lines of the angle. The **Corner Radius 2** spinner is used to set the internal radius between the vertical and horizontal lines of the angle. The **Edge Radii** spinner is used to define the radius of the edges of the legs of the L-shaped spline, as shown in Figure 5-64.

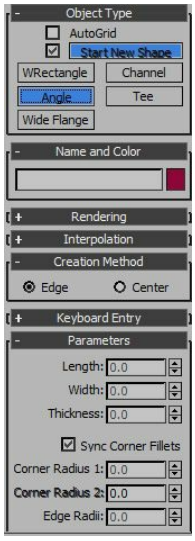


Figure 5-61 *Various rollouts to create and modify an angle spline*

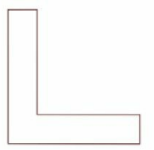


Figure 5-62 *An angle spline*

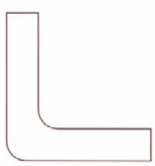


Figure 5-63 *The angle spline with corner radius*

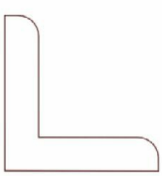


Figure 5-64 *An angle spline with edge radii*

Creating a Tee Spline

Menu bar: Create > Extended Shapes > Tee

Command Panel: Create > Shapes > Extended Splines > Object Type rollout > Tee

The tee spline is a T-shaped closed spline. To create a tee spline, activate the viewport in which you want to create it and then choose the **Tee** tool from the **Object Type** rollout; various rollouts will be displayed, as shown in Figure 5-65. Next, press and hold the left mouse button and drag the cursor to set the length and width of the tee spline. Now, move the cursor to define the thickness and click on the viewport; a T-shaped tee spline will be created in the viewport, as shown in Figure 5-66. The **Parameters** rollout used to modify the tee spline is discussed next.

Parameters Rollout

The options in this rollout are used to modify the tee spline. The **Length**, **Width**, and **Thickness**

spinners are used to specify the length, width, and thickness of the angle spline, respectively.The **Corner Radius** spinner is used to round the corners between the horizontal and vertical shapes, as shown in Figure 5-67.

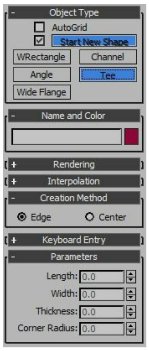


Figure 5-65 *Various rollouts to create and modify a tee spline*

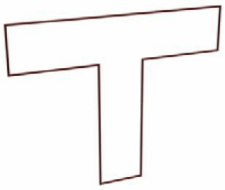


Figure 5-66 *A T-shaped tee spline*

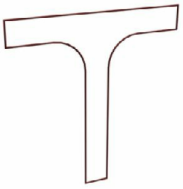


Figure 5-67 *A tee spline with corner radius*

Creating a Wide Flange Spline

Menu bar: Create > Extended Shapes > Wide Flange
Command Panel: Create > Shapes > Extended Splines >
Object Type rollout > Wide Flange

The wide flange spline is an I-shaped closed spline. To create a wide flange spline, activate the viewport in which you want to create it and then choose the **Wide Flange** tool from the **Object Type** rollout; various rollouts will be displayed, as shown in Figure 5-68.

Next, press and hold the left mouse button and drag the cursor to set the

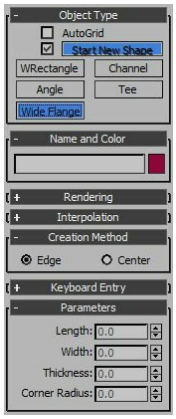


Figure 5-68 *Various rollouts to create and modify a wide flange spline*

length and width of the wide flange spline. Next, move the mouse to define the thickness and click on the viewport; an I-shaped wide flange spline will be created in the viewport, as shown in Figure 5-69.

The **Parameters** rollout used to modify the wide flange spline is discussed next.

Parameters Rollout

The options in this rollout are used to modify a wide flange spline. The **Length**, **Width**, and **Thickness** spinners are used to specify the length, width and thickness of the wide flange spline. The **Corner Radius** spinner is used to round the corners between the horizontal and vertical shapes of the wide flange spline, as shown in Figure 5-70.

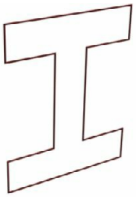


Figure 5-69 *An I-shaped wide flange spline*

Figure 5-70 *The wide flange spline with corner radius*

TUTORIALS

Tutorial 1

In this tutorial, you will create a photo frame using different splines, as shown in Figure 5-71.
(Expected time: 45 min)

The following steps are required to complete this tutorial:

a. Create the project folder.
b. Create base.
c. Create the inner rectangular frame
d. Create the outer rectangular frame.
e. Create joints.
f. Create spiral design.
g. Create Text.
h. Save and render the scene.

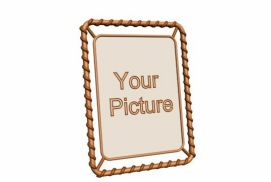


Figure 5-71 *The model of a photo frame*

Creating the Project Folder

Create a new project folder with the name *c05_tut1* at *\Documents\3dsmax2015* and then save the file with the name *c05tut1*, as discussed in Tutorial 1 of Chapter 2.

Creating base

In this section, you will create base of the photoframe using the **Plane** tool.

1. Make sure the Front viewport is activated. Choose **Create > Geometry** in the **Command Panel**. In this panel, **Standard Primitives** is displayed in the drop-down list located below it. Next, choose the **Plane** tool from the **Object Type** rollout.

2. In the **Keyboard Entry** rollout, set the parameters as follows:

Length: **111.7** Width: **81.5**

Choose the **Create** button; a plane is created in the viewports, as shown in Figure 5-72.

3. In the **Name and Color** rollout, enter the name **base**. Also change its color to white.

Creating the Inner Rectangular Frame

In this section, you will create inner rectangular frame using the Rectangle tool.

1. Activate the Front viewport. Choose **Create > Shapes** in the **Command Panel**; the **Splines** option is displayed in the drop-down list. Next, choose the **Rectangle** tool from the **Object Type** rollout.

2 Expand the **Keyboard Entry** rollout and specify the parameters as follows:

Length: **115.2** Width 2: **85.2** Corner Radius: **10**

3. Now, choose the **Create** button; a rectangle is displayed in the viewports.

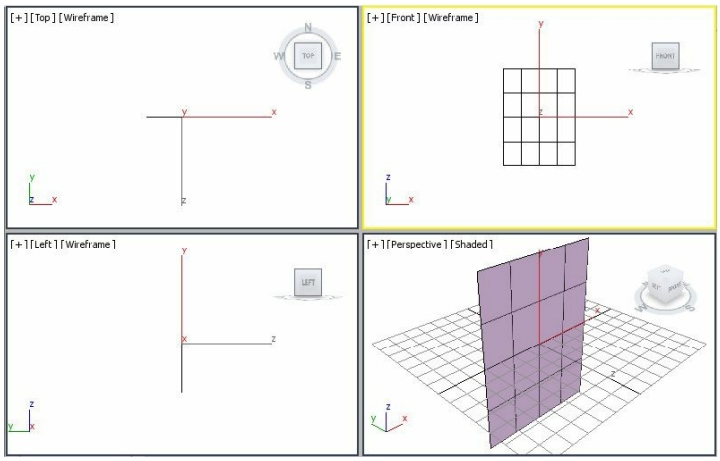


Figure 5-72 *The plane displayed in viewports*

4. In the **Rendering** rollout, select the **Enable in Renderer** and **Enable in Viewport** check boxes. Make sure that the **Radial** radio button is selected. Next, set the value **3.5** in the **Thickness** spinner. Figure 5-73 shows the rectangle displayed in the viewports.

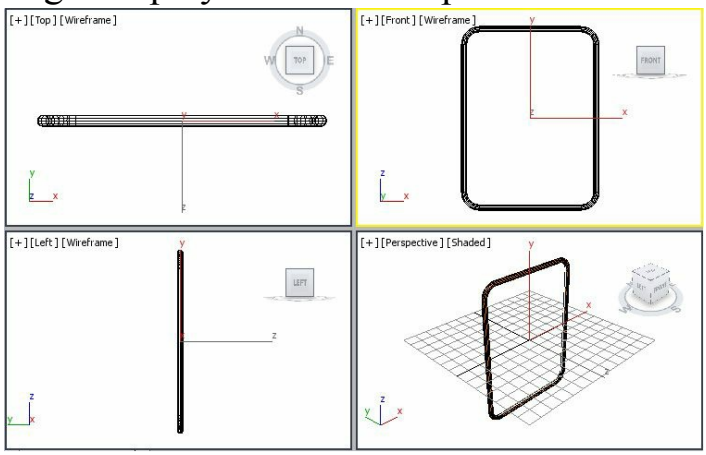


Figure 5-73 *The rectangle displayed in the viewports*

5. In the **Name and Color** rollout, enter the name **inner frame** and press the ENTER key. and use the color swatch to change its color by using the following values:

Red: **248** Green: **58** Blue: **0**

Creating the Outer Rectangular Frame

In this section, you will create outer rectangular frame using the **Rectangle** tool.

1. Make sure the **Rectangle** tool is chosen from **Create > Shapes > Splines > Object Type** rollout in the **Command Panel**.

2. Make sure the Front viewport is activated. Next, expand the **Keyboard Entry** rollout and set the parameters as follows:

Length: **143** Width: **107** Corner Radius: **10**

3. Choose the **Create** button; the rectangle is displayed in the viewports, as shown in Figure 5-74.

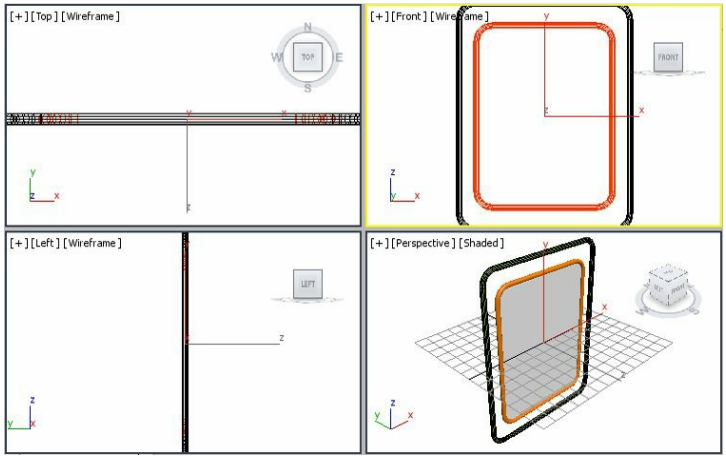


Figure 5-74 *The rectangle displayed in the Viewports*

4. In the **Name and Color** rollout, enter the name **outer frame**. Also, assign the same color to it that you assigned to *inner frame*. Choose the **Zoom Extents All** tool from the viewport navigation controls to view all objects in all the viewports properly.

Creating Joints

In this section, you will create joints between *inner frame* and *outer frame* using the **Line** tool.

1. Activate the Front viewport. Next, choose the **Line** tool from **Create > Shapes > Splines > Object Type** rollout from the **Command Panel**.

2. Click in the viewport at the upper left corner of *inner frame* and create a line upto the upper left corner of *outer frame*, as shown in Figure 5-75.

3. In the **Rendering** rollout, set **3** in the **Thickness** spinner.

4. In the **Name and Color** rollout, enter the name **joint1** and assign the same color to it that you assigned to *inner frame*. Figure 5-76 shows *joint1* in the Front viewport.

5. Create three copies of *joint1*. Now, align the copied joints in the viewports using the **Select and Rotate** and **Select and Move** tools, as shown in Figure 5-77.

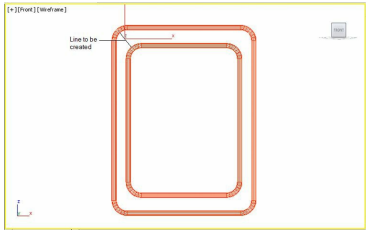


Figure 5-75 *The line to be created in the Front Viewport*

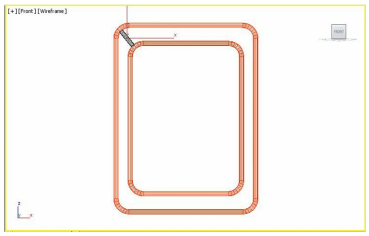


Figure 5-76 *The joint1 geometry in the Front Viewport*

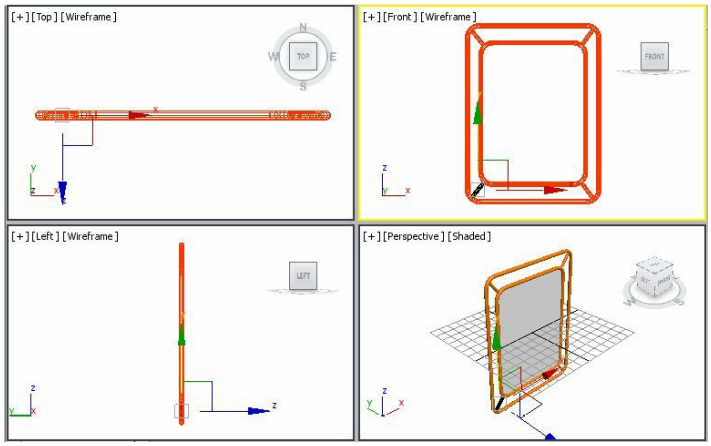


Figure 5-77 *All joints aligned in the Viewports*

Creating Spiral Design

In this section, you will create spiral design on the photoframe using the **Helix** tool.

1. Activate the Left viewport. Choose the **Helix** tool from **Create > Shapes > Splines > Object Type** rollout in the **Command Panel**.

2. In the **Keyboard Entry** rollout, set the following parameters:

Radius 1: **2.0** Radius 2: **2.0** Height: **100**

Choose the **Create** button; a helix is created.

3. In the **Parameters** rollout, set **10** in the **Turns** spinner.

4. In the **Rendering** rollout, set **3.5** in the **Thickness** spinner.

5. In the **Name and Color** rollout, enter the name **design1**. Assign the same color to it that you assigned to *inner frame*.

6. Align *design1* using the **Select and Move** and **Select and Rotate** tools in the viewports, as shown in Figure 5-78.

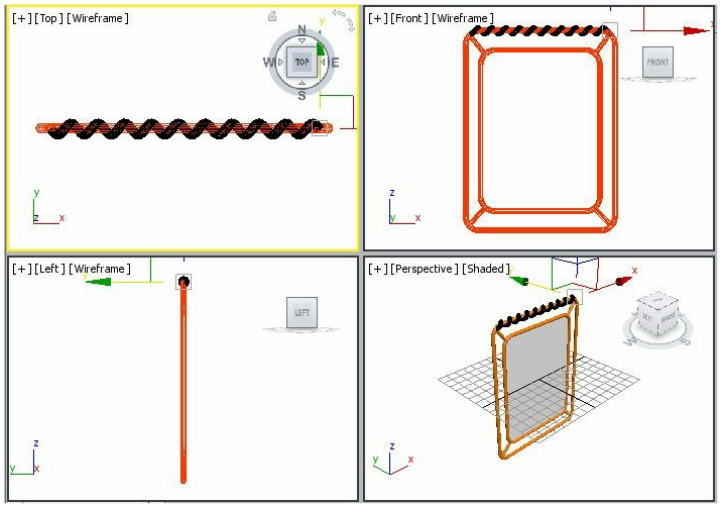


Figure 5-78 *The design1 geometry aligned in the Viewports*

7. Create a copy of *design1* and align it, as shown in Figure 5-79.

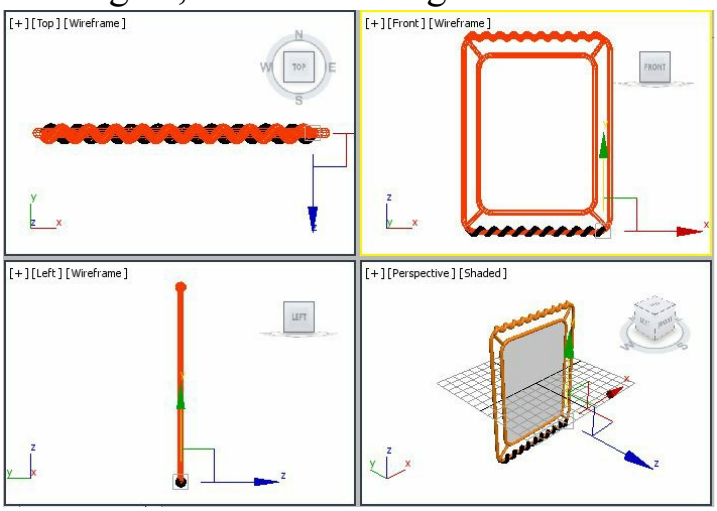


Figure 5-79 *The copy of design1 aligned in the Viewports*

8. Activate the Top viewport. Choose the **Helix** tool from **Create > Shapes > Splines > Object Type** rollout in the **Command Panel**.

9. In the **Keyboard Entry** rollout, make sure the value in the **Radius 1** and **Radius 2** spinners is set to **2.** Set **132** in the **Height** spinner.
Choose the **Create** button; a helix is created.

10. In the **Parameters** rollout, set **15** in the **Turns** spinner.

11. In the **Rendering** rollout, make sure the value in the **Thickness** spinner is set to **3.5**.

12. In the **Name and Color** rollout, enter the name *design3*. Assign the same color to it that you assigned to *inner frame*.

13. Align *design3* in the viewports, as shown in Figure 5-80.

14. Create a copy of *design3* and align it, as shown in Figure 5-81.

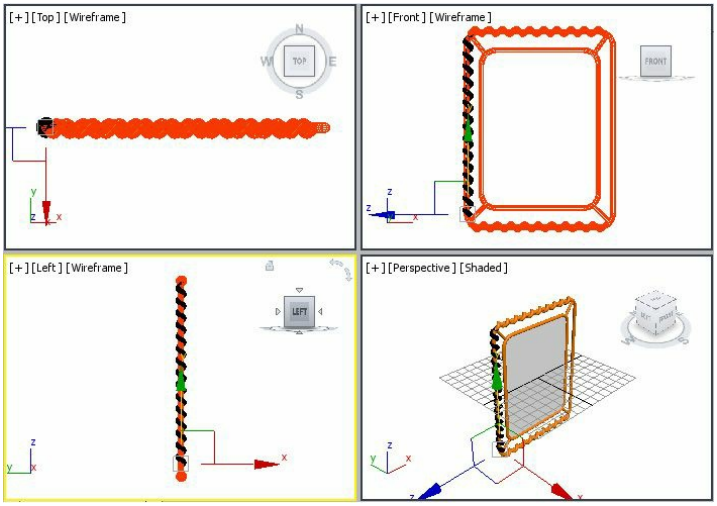


Figure 5-80 *The design3 geometry aligned in the Viewports*

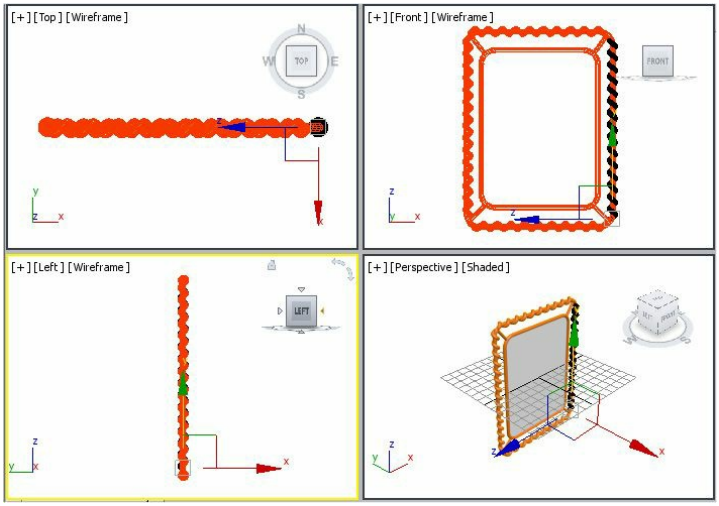


Figure 5-81 *The copy of design3 geometry aligned in the Viewports*

Creating Text

In this section, you will create text on the photoframe using the **Text** tool.

1. Activate the Front viewport. Choose the **Text** tool from **Create > Shapes > Splines > Object Type** rollout in the **Command Panel**.

2. In the **Parameters** rollout, type **Your** in the **Text** text box and press ENTER. Next, type **Pictures**. Also set **25** in the **Size** spinner. Also, choose the Center Align button.

3. In the **Rendering** rollout, select the **Enable in Renderer** and **Enable in Viewport** checkboxes. Also, make sure that the **Radial** radio button is selected and **1** is set in the **Thickness** spinner. Next, click in the Front viewport; a text is created in the viewport with the name *Text001*.

4. Assign black color to *Text001* and align it in the viewports, as shown in Figure 5-82.

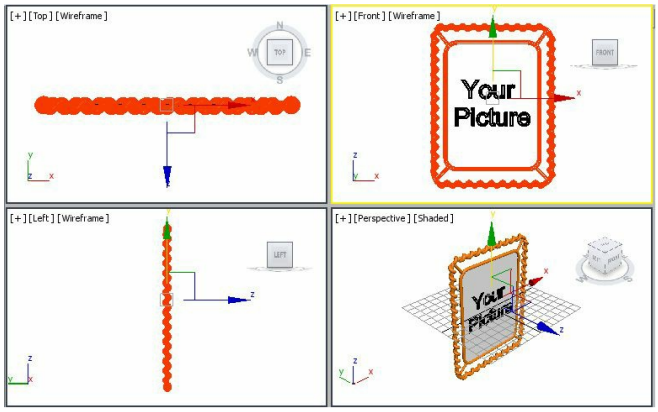


Figure 5-82 *Text001 aligned in the Viewports*

Saving and Rendering the Scene

In this section, you will save and render the scene. You can also view the final rendered image of this scene by downloading the *c05_3dsmax_2015_rndr.zip* file from *www.cadcim.com*. The path of the file is as follows: *Textbooks > Animation and Visual Effects > 3ds Max > Autodesk 3ds Max 2015: A Comprehensive Guide*

1. Change the background color of the scene to white, as discussed in Tutorial 1 of Chapter 2.

2. Choose **Save** from the **Application** menu.

3. Activate the Perspective viewport. Next, choose the **Render Production** tool from the **Main Toolbar**; the **Rendered Frame** window is displayed. This window shows the final output of the scene, refer to Figure 5-83.

Figure 5-83 *The final output after rendering*

Tutorial 2

In this tutorial, you will create the model of a book, as shown in Figure 5-84, using splines and extended splines. **(Expected time: 15 min)**

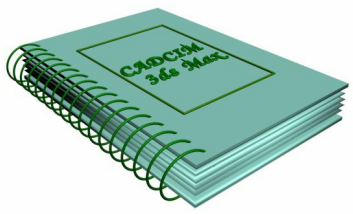


Figure 5-84 *The model of a book*

The following steps are required to complete this tutorial:

a. Create the project folder.
b. Create a book.
c. Create the spiral binding of the book.
d. Create the text on the book.
e. Save and render the scene.

Creating the Project Folder

Create a new project folder with the name *c05_tut2* at *\Documents\3dsmax2015* and then save the file with the name *c05tut2*, as discussed in Tutorial 1 of Chapter 2.

Creating a Book

In this section, you will create a book using the **Hose** tool from **Extended Primitives**.

1. Activate the Top viewport. Choose **Create > Geometry** in the **Command Panel** and then select **Extended Primitives** from the drop-down list displayed below the **Geometry** button. Now, choose the **Hose** tool from the **Object Type** rollout.

2. In the Top viewport, press and hold the left mouse button and drag the cursor to define the radius of the hose. Next, release the left mouse button and move the cursor up to define the height of the hose. Now, click on the viewport to get the desired height; a hose is created.

3. Name the hose as *book* in the **Name and Color** rollout and change its color by entering the values as follows:
Red: **153** Green: **228** Blue: **214**

4. Choose the **Modify** tab in the **Command Panel**. In the **Free Hose Parameters** area of the **Hose Parameters** rollout, set the value **29.798** in the **Height** spinner. Next, in the **Common Hose Parameters** area of the **Hose Parameters** rollout, make sure the **Flex Section Enable** check box is selected. Use default values for other options.

5. In the **Hose Shape** area of the **Hose Parameters** rollout, select the **Rectangular Hose** radio button and then set the values **144.927** and **210.827** in the **Width** and **Depth** spinners, respectively. Use the default values for other options.

6. Choose the **Zoom Extents All** tool to view *book* in viewports, as shown in Figure 5-85.

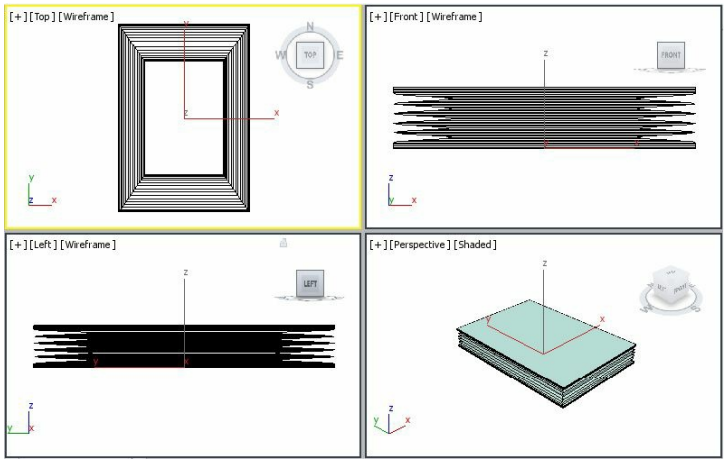


Figure 5-85 *The book geometry after invoking the* ***Zoom Extents All*** *tool*

Creating the Spiral Binding of the Book

In this section, you will create the helix spline for creating the spiral binding of the book.

1. Activate the Front viewport and choose **Create > Shapes** in the **Command Panel**. Make sure that **Splines** is selected in the drop-down list displayed below the **Shapes** button. Now, choose the **Helix** tool from the **Object Type** rollout.

2. Expand the **Keyboard Entry** rollout and enter the values as follows:
Radius 1: **17.0** Radius 2: **17.0** Height: **205.0**

3. Choose the **Create** button; a helix shape is created in the viewports.

4. Name the helix as *spiral binding* and change its color by entering the values as follows:
Red: **6** Green: **134** Blue: **6**
5. Choose the **Modify** tab in the **Command Panel** and then in the **Rendering** rollout, select the **Enable In Renderer** and **Enable In Viewport** check boxes. Make sure the **Radial** radio button is selected and then set the value **1.5** in the **Thickness** spinner. Next, in the **Parameters** rollout, set the value **17.0** in the **Turns** spinner.

6. Choose the **Select and Move** tool and align *spiral binding* with *book* in the viewports, as shown in Figure 5-86.

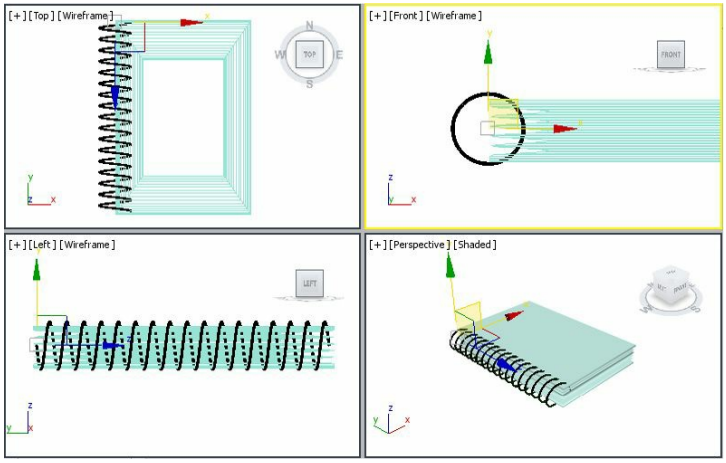


Figure 5-86 *Alignment of spiral binding with book in the viewports*

Creating the Text on the Book

In this section, you will use the **Text** tool to create the text on the book.

1. Choose **Create > Shapes** from the **Command Panel**; the **Splines** option is selected in the drop-down list. Now, choose the **Text** tool from the **Object Type** rollout. Also, select the **AutoGrid** check box in the **Object Type** rollout.

2. In the **Parameters** rollout of the **Text** tool, type **CADCIM** in the **Text** text box and press ENTER. Next, type **3ds Max** and click in the Perspecctive viewport; the text is displayed in the viewports.

3. Name the text as *text01* and change its color by entering the values as follows:
Red: **6** Green: **134** Blue: **6**

4. Choose the **Modify** tab in the **Command Panel** and then select the **Monotype Corsiva** font type from the drop-down list located at the top of the **Parameters** rollout. Next, choose the center align button and enter the values as follows:

Size: **23** Kerning: **1.0** Leading: **1.0**

5. Choose the **Select and Move** tool and align *text01* in viewports, refer to Figure 5-87.

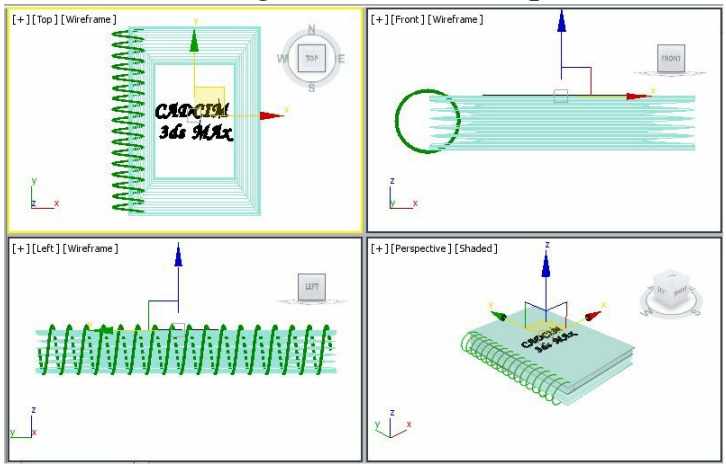


Figure 5-87 *Alignment of text01 on book in viewports*

Next, you need to create a rectangular design over the text.

6. Make sure that the **Splines** option is selected in the drop-down list of the **Command Panel**.Choose the **Rectangle** tool from the **Object Type** rollout. Make sure the **AutoGrid** check box is still selected.

7. Activate the Perspective viewport. Click at the upper left corner of *book*, hold the left mouse button, and then drag the cursor to the lower right corner of *book*. Next, release the left mouse button to set the length and width; a rectangular spline is created in the viewports.

8. Name the rectangle as *rectangular design* and change its color by entering the values as follows:

Red: **6** Green: **134** Blue: **6**

9. Choose the **Modify** tab in the **Command Panel**. In the **Rendering** rollout, set the value **1.0** in the **Thickness** spinner. Next, set the parameters in the **Parameters** rollout as follows:
Length: **126.581** Width: **87** Corner Radius: **10.0**

10. Choose the **Select and Move** tool and align *rectangular design* in the viewports, as shown in Figure 5-88.

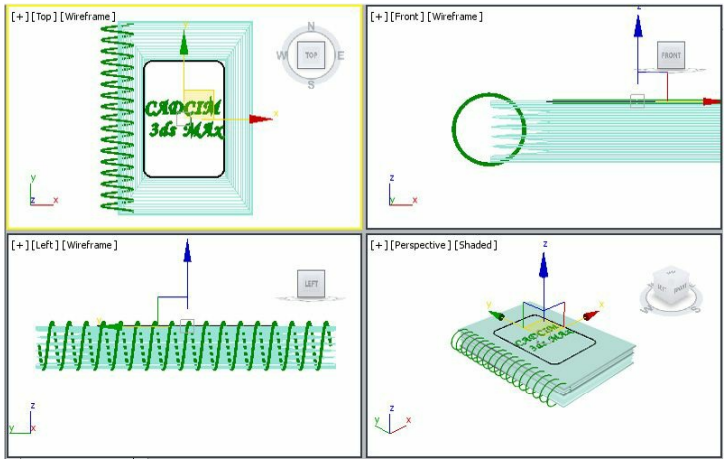


Figure 5-88 *Alignment of rectangular design in the viewports*

Saving and Rendering the Scene

In this section, you will save the scene and then render it. You can also view the final rendered image of this scene by downloading the *c05_3dsmax_2015_rndr.zip* file from *www.cadcim.com.* The path of the file is as follows: *Textbooks > Animation and Visual Effects > 3ds Max > Autodesk 3ds Max 2015: A Comprehensive Guide*

1. Change the background color of the scene to white, as discussed in Tutorial 1 of Chapter 2.

2. Choose **Save** from the **Application** menu.

3. Activate the Perspective viewport. Next, choose the **Render Production** tool in the **Main Toolbar**; the **Rendered Frame** window is displayed, showing the final output of *book*, refer to Figure 5-89. Next, close this window.

Figure 5-89 *The final output after rendering*